Stronger Pathways
to Infant Vitality

Final Technical Report

BGSU Center for Regional Development
BOWLING GREEN STATE UNIVERSITY

PROMEDICA

THE HOSPITAL COUNCIL of Northwest Ohio

Acknowledgements

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Executive Summary

This research study evaluated the Northwest Ohio Pathways HUB Maternal Pathways Program (HUB) operated by the Hospital Counsel of Northwest Ohio (HCNO). The HUB works in partnership with area healthcare industry leaders, and a variety of community organizations to provide coordinated care and support services to low-income women of childbearing age and their babies. There is robust evidence demonstrating the effectiveness of the Pathways HUB Model for improving birth outcomes, both in Ohio and across the country (Lucas et al. 2018a, 2018b; AMCHP 2019). The goal of the research was to conduct a program evaluation of the HUB to improve program performance. The overarching research question was how can this program be improved to deliver better results for mothers in NW Ohio? Researchers' discussion with the grant partners indicated that it is important to determine what barriers affect participant pathway access, utilization, and completion. Further, there was a desire to understand how ground level mechanisms translate the known social determinants of infant vitality addressed in these pathways into distinct outcomes for mothers and their children.

Methodology

To answer these questions, the research team assessed both primary and secondary data. Deidentified secondary data was harvested from the Care Coordination Systems (CCS) data system by HNCO staff. Primary data was collected by the Bowling Green State University (BGSU) research team via telephone/zoom interviews, surveys, and focus groups with five distinct groups associated with the NW Ohio Pathways HUB Program. The research activities undertaken with each group are listed below.

1. Interviews with mothers who are currently participating in the HUB Program.
2. Interviews with mothers who participated in the HUB program previously.
3. Interviews with CHWs who guide mothers through the program.
4. Survey of Pathways program management from partner organizations (CHW agencies and Service Providers).
5. Focus group with HCNO HUB staff.
6. Surveys with mothers to capture their overall impressions of the HUB.

7. This primary data collection was coupled with the analysis of pre-existing historical program data obtained from HCNO.

These data were used to assess various aspects of the Pathways HUB, its efficacy in addressing the Social Determinants of Health (SDoH), and in turn, addressing infant mortality in Northwest Ohio. Table 1 below summarizes the key themes and questions examined in this report and indicates which data source(s) speak to each. A bulleted list of summary results is provided below, organized around these themes. Recommendations for HUB actions and future research are included at the end of the summary results.

Table 1: Summary of Key Themes/Questions and Data Sources

Theme/Research Question	Mom Interview/Survey	Agency Survey	HUB Program Data	CHW Interviews	HCNO Focus Group
Service/Pathway Utilization & Knowledge	●		●		
Risk Factors General			●		
Mental Health, Stress	●		●		
Housing	●		●		
Medical Services	●				
Facilitators & Barriers for Pathway Completion	●	●	●	●	●
What factors contribute to successful birth outcomes?			●		
HUB Organizational Analysis		●		●	●
SWOT Analysis		●		●	●
The HUB Model		●		●	●
Barriers to Success/Pathways Completion		●		●	●

Results Summary

Risk Factors

- Stress reduction due to program enrollment is a clear and consistent finding from the data. The interviews with mothers indicate that their relationship with their CHW and the emotional support and support accessing resources are the central driver in this stress reduction. This finding is important given the link between stress and risky birth outcomes (preterm and low weight births), particularly for black mothers.
- In addition to stress reduction, a large majority of mother surveyed reported HUB participation increased or significantly increased their feelings of security, safety, and hope.

Pathway Knowledge, Completion, and (Under)Utilization

- Nearly three-quarters of the over 58,000 pathways opened during the time period studied were completed, and completion rates are consistent across racial groups.
- Some pathways are underutilized due to lack of awareness of resources available, focus on immediate needs, and competing demands for time and attention.

Medical Services

- A majority of mothers have positive opinions of their healthcare providers and have had positive experiences in the healthcare system, though they have slightly more positive opinions of their OBGYN than their primary care doctors or child's pediatrician.
- A smaller but significant number of mothers have neutral or negative opinions, and more significantly, have had traumatic experiences that have altered their trust toward doctors and/or caused them to switch doctors.
- One third of interviewees had previous negative experiences with doctors including feeling uncomfortable, confused, and not listened to, as well as had decisions made for them with which they did not agree.

Birth Outcomes

- The HUB's annual reports indicate that infant mortality rates for mothers enrolled in the HUB are consistently lower than rates for mothers in the region not enrolled.

- The fact that the rate of preterm births and low birth weights are similar to the expected rates, but the infant mortality rates are lower, suggests potential positive influence of the program.

Organizational Assessment

- The growth of the HUB clientele indicates that the HUB is successful in recruitment.
- Stakeholder input revealed challenges in balancing partner agency autonomy with standardization across partners, as well as communication difficulties created in a networked model.
- The CCS software presents several challenges for HUB staff, partners, and CHWs for inputting, understanding, and analyzing client data.

Recommendations

- Given the central role of CHWs in addressing client risk factors, particularly stress, it is essential CHWs be given or can maintain a client caseload that allows them the time to form meaningful relationships with clients.
- Given the strong relationship between stress and birth outcomes and the clear finding above that HUB participation reduces stress, future research should further investigate this relationship in a more robust way.
- At an individual level, the HUB could consider developing a medical advocacy educational pathway to help clients respond to poor treatment.
- At a programmatic level, the HUB could consider finding ways to help mothers have advocates attend important medical visits to make sure clients have support.
- The HUB should consider adopting new ways to address pathway underutilization through client/CHW education or additional checklists to uncover unmet needs.
- The HUB should consider broadening their partnerships with relevant community groups, churches, and schools to promote the program, developing volunteer outreach programs, or applying for grants that could fund expanding outreach capacity.
- The HUB should improve cross-system coordination to address communication and standardization challenges.

- The HUB should find improvements within CCS to address identified challenges and/or consider alternative systems.
- Determine how the most successful agencies reduce CHW turnover and increase job satisfaction.

Introduction and Overview of NW Ohio Pathways HUB

This research study evaluated the Northwest Ohio Pathways HUB Maternal Pathways Program (HUB) operated by the Hospital Counsel of Northwest Ohio (HCNO). The HUB works in partnership with ProMedica, other area healthcare industry leaders, and a myriad of community organizations to provide coordinated care and support services to low-income maternal aged woman and their babies. The HUB model is a nationally recognized, evidence-based best practice for improving birth outcomes. In particular, the HUB model has been widely recognized as an innovative and promising approach to reducing overall infant mortality rates, and in reducing racial disparity in infant health outcomes for African American mothers. The program identifies at-risk mothers, conducts a comprehensive risk assessment of threats to their health (e.g., food insecurity, unstable housing, lack of transportation), and translates each risk factor into a care "Pathway". Clients are assigned Community Health Workers (CHWs) employed at 12 partnering Northwest Ohio medical and social service agencies who assist mothers in completing pathways to reduce their identified health risks. (Adelante, Baby University, Compassion Health Toledo, East Toledo Family Center, Erie County Health Department, Henry County Health Department, La Posada Family Emergency Shelter, Mercy Health, ProMedica, Toledo/Lucas County CareNet, University Church, YWCA of Northwest Ohio).

There is strong evidence demonstrating the effectiveness of the Pathways HUB Model for improving birth outcomes, both in Ohio and across the country (Lucas et al. 2018a, 2018b; AMCHP 2019). The evidence also shows HUBs provide a good return on investment; HUBs reduce risky outcomes, like low-birth weight, and save stakeholders money in short- and long-term healthcare expenditures (Redding 2015). There is also a growing resource base compiled by the network of HUBs across Ohio and the country to provide technical assistance, staffing, budgeting, and implementation resources for new and developing HUBs (AMCHP 2019; PCHI 2019). Despite a growing evidence and resources base, there are still gaps in the current knowledge. The Association of Maternal and Child Health Programs notes that the HUB program is "still in its early development" and that there is a need for "identifying quality improvement opportunities" that can improve local and national HUBs (AMCHP 2019). Further, local HUB administrators have identified the need to understand why more mothers are not completing their pathways to reduce health risks associated with infant mortality. Lastly, an extensive academic

literature has studied the broad social determinants of infant mortality (ex. healthcare spending, neighborhood segregation, race, SES), but much less is known about the ground level mechanisms that translate these social determinants into outcomes for mothers and their children (Kim & Saada 2013).

This research is important because it meets these identified needs: the practical need for identifying program improvement and pathway completion opportunities for HUBs, and the theoretical need for better understanding of how social determinants of infant mortality are translated into birth outcomes. The research was conducted using a ground level approach, based on interviewing community health workers, program participants, and program administrators (discussed more in the methods section to follow). These participants are uniquely positioned to provide a key source of evidence for why mothers are not closing pathways. Previous research on similar intervention-based programs have found that citizens may reject even well-intended and low-cost services for a variety of reasons, like understanding, distrust, and access (Carmichael & McDonough 2019). The only way to truly know the reasons these pathways are not being closed is to ask the people directly involved. Thus, studying the Pathways HUB model offered a unique opportunity to better understand and discover the ground-level mechanisms that contribute to infant mortality and to do so within a best-practice program to better understand the processes that can improve an already promising program.

A benefit of conducting this study as a participant-based evaluation was for CHW's and participating mothers to be provided with the opportunity to provide confidential feedback on their experiences and outstanding needs. The study design aimed to provide mothers a source of agency in being able to participate in actively shaping the program in which they are participating. Similarly, CHWs, HUB partners and HUB staff were given an opportunity to voice ideas for shaping future HUB processes based on their experience and expertise. The support of both HCNO and ProMedica in this work signals to the community that area healthcare leaders care about the health inequities in Northwest Ohio and are actively engaging residents to find solutions.

Methods

The goal of the research was to conduct a program evaluation of the HUB to improve program performance. The overarching research question was how can this program be improved to deliver better results for mothers in NW Ohio? Researchers' discussion with the grant partners indicated that it is important to determine why about one-third of the individuals who are referred to the HUB and prescribed a pathway discontinue receiving services before the birth of their child or simply do not follow their pathway to completion. In other words, what barriers affect participant pathway access, utilization, and completion? Further, how do ground level mechanisms translate the known social determinants addressed in these pathways into distinct outcomes for mothers and their children?

To answer these questions, the research team assessed both primary and secondary data. Deidentified secondary data was harvested from the Care Coordination Systems (CCS) data system by HNCO staff. This software allows HCNO to create a researcher's access tab within the program. This feature automatically deidentifies the data, so that when researchers access the system, they have no way of identifying individuals in the dataset. The data was cleaned and compiled by the BGSU research team with the assistance of HCNO personnel. Primary data was collected by the BGSU research team via telephone/zoom interviews, surveys, and focus groups with five different groups associated with the NW Ohio Pathways HUB Program. The research activities undertaken with each group are listed below.

1. Interviews with mothers who are currently participating in the HUB Program.
2. Interviews with mothers who participated in the HUB program previously.
3. Interviews with CHW's who guide mothers through the program.
4. Survey of Pathways program management from partner organizations (CHW agencies and Service Providers).
5. Focus group with HCNO HUB staff.
6. Surveys with mothers to capture their overall impressions of the HUB. This primary data collection was coupled with the analysis of pre-existing historical program data obtained from HCNO.

As indicated by the central questions above, these data were used to assess various aspects of the Pathways HUB, its efficacy in addressing the Social Determinants of Health (SDoH), and in turn, addressing infant mortality in Northwest Ohio. Table 1 summarizes the key themes and questions examined in this report and indicates which data source(s) speak to each. Because pathway completion addresses known risk factors to positive birth outcomes and infant vitality, which are the key points of focus for this research, this theme was addressed across the most data sources, while other data sources target more specific themes. The methodological details of each piece of the study are provided in the sections below. Data findings and discussion will be organized by the themes included in Table 1.

Table 1: Summary of Key Themes/Questions and Data Sources

Theme/Research Question	Mom Interview/Survey	Agency Survey	HUB Program Data	CHW Interviews	HCNO Focus Group
Service/Pathway Utilization & Knowledge	●		●		
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Mental Health, Stress	●		●		
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Medical Services	●				
Facilitators & Barriers for Pathway Completion	●	●	●	●	●
What factors contribute to successful birth outcomes?			●		
HUB Organizational Analysis		●		●	●
SWOT Analysis		●		●	●
The HUB Model		●		●	●
Barriers to Success/Pathways Completion		●		●	●

1. Interviews with mothers currently participating in the HUB Program

Forty-nine (49) mothers comprised our program participant interview sample. Mothers were recruited using flyers designed by the research team that were distributed in several ways. First, the research team worked through Community Health Workers (CHWs) to recruit mothers currently enrolled in the program. As part of HCNO's, and their partners' regular communication process with mothers enrolled in the program, they referred interested individuals to the research team using our fliers. The research team provided CHWs a short flyer to be passed on to mothers that described the research study. Because mothers have already established a relationship with the CHWs and trust them, we believed this would be a better method of first contact about potential study participation. To incentivize CHWs to assist with this recruitment gift card raffles were conducted in which each referral earned the CHW an entry into the drawing. The CHWs were very responsive to the study and helped extensively with recruitment- seeing study participation as a benefit to their clients. To broaden the sample and avoid sample bias associated with CHW recruitment of mothers, the research team posted the fliers at community resource locations, such as area food banks, local agencies, government offices, and churches.

Mothers interested in participating contacted the research team by phone or email to obtain further information about the study and receive consent forms if they were willing to participate. The research team utilized google applications in order to create a centralized contact system for study participants including a general information Gmail account (info@strongerpathways.org) and a centralized phone number created through Google Voice, which allows us to create a publicly shared phone number that forwarded incoming calls to designated principal investigators. We used Adobe Sign to process consent forms due to the flexibility of the application which allows for completion and submission via mail, email, and text link. After researchers obtained consent, researchers contacted the mothers again by phone or text to set up a time for an initial interview.

The initial interviews lasted for approximately 20-30 minutes. During this interview, we established an appropriate time for subsequent meetings and, when agreed to, conducted 1-2 twenty-minute meetings monthly for the remainder of the study period. The grant provided funding for a data collection period of nine months, so mothers enrolled at the beginning of the data collection window had the opportunity to complete seven (7) subsequent

interviews, for a total of eight (8) interviews. Mothers who enrolled in the study later were enrolled using the same procedures but had fewer total interviews. During the interviews, mothers were asked a series of open-ended questions about their experience in the program. Some questions were the same for every interview, while others shifted as the mothers had more experience with the program. For example, initial questions asked about their experience enrolling in the program, while questions in later months asked about their experiences with services, like housing, food assistance or healthcare. A full list of the interview questions for the currently enrolled pathways participants is included in Appendix III.

Interviews were conducted by each of the four members of the research team: principal investigators Dr. Nichole Fifer or Dr. Justin Rex, co-investigator Dr. Karen Johnson-Webb, and graduate assistant Maddi Georgoff. The mothers in the sample were divided roughly evenly across the research team, so each researcher conducted monthly interviews with the same 12- 13 mothers. Mothers were compensated for their participation in the study. The grant funding provided $500 for each mother who participated for the full length of the study. For full participants, the money was provided in $50 monthly installments. Additionally, mothers received $50 for agreeing to enroll in the full study. Compensation was pro-rated for those who participated for a shorter amount of time and fewer interviews. Mothers who enrolled later in the 9-month study period received $50 for enrolling and $50 monthly for continued participation in the interviews. Compensation was given in the form of gift cards that were mailed or delivered monthly. Mothers' last contacts with the research team were during the final interview and to receive the final portion of their compensation.

In total, the research team completed 220 interviews across 41 mothers enrolled in the program. These clients were referred by 11 different CHWs across 7 different agencies/organizations within the HUB network. In the results section below we present some individual stories to illustrate examples of key themes in the analysis. More systematically, the research team coded common questions across the interviews to analyze trends in the interview data. The research team grounded the development of coding categories in the language and stories the mothers used in the interviews rather than employing pre-defined coding categories.

2. Interviews with mothers who previously participated in the HUB program

We wanted the sample to include mothers who are not currently enrolled in the program as well, including those who dropped out of the program and those who have matriculated from the program. These participants were recruited via their former CHWs, through the posted advertisements, and direct recruitment by the research team. For direct recruitment HCNO provided the BGSU team with contact information for mothers who dropped out or graduated from the program. Mothers interested in participating contacted the research team by phone or email to obtain further information about the study and receive consent forms if they were willing to participate. The mothers in the sample who had previously dropped out or graduated from the program were given the opportunity to complete (1) hour-long interview at a time scheduled at their convenience and received a $50 gift card in compensation after completing their interview. In total the team completed seven interviews with mothers who were past clients. A full list of the interview questions for Pathways graduates is included in Appendix II.

3. Interviews with CHW's

CHWs were recruited through monthly CHW meetings and by their professional email and phone number, which researchers obtained from HCNO. As part of the research enterprise some members of the research team attended the HUB's monthly CHW meeting to gather information on CHW updates and Pathways announcements. This gave the research team an inside perspective on HUB operations as well as providing some face time between the researchers and the CHWs. This helped to enroll CHW's as study participants and to conduct outreach with them to assist in recruitment of mothers for the study.

Those CHWs that decided to participate in the study were interviewed twice throughout the study period. The initial interview lasted 30-45 minutes. Follow up interviews took place during the end of the study period and lasted approximately 30 minutes. Interviews contained a set of open-ended questions about their experience and evaluation of the HUB program. A full list of the interview questions for CHWs is included in Appendix I. Like mothers, the 15 CHWs were divided between the four members of the research team, meaning each member interviewed 3-4 CHWs throughout the process. Like mothers, CHWs earned a gift card for participating in the

interviews and observations. They received a $25 gift card for each interview for a retailer of their choice. CHWs' last point of contact with the researchers was their last interview.

4. Survey of Pathways partner organizations

A sample comprised of leadership and staff of health and social service coordinated care agencies who partner with the HUB, was recruited to take a survey about HUB operations, client services and supports, and barriers to success for clients and CHWs. A list of partner agencies was provided by HCNO, and survey participants were recruited by their professional public emails. A copy of that recruitment script is provided in Appendix IV. After obtaining consent, researchers emailed subjects a link to an electronic survey through Qualtrics. Representatives from 5 partner agencies completed the survey. A copy of this survey is included in Appendix V.

5. Focus group with HUB staff at HCNO

HCNO leadership working with the research team helped to identify a group of HCNO staff most able to provide perspective on the daily internal operations of the HUB. The HCNO staff had their first contact with the researchers when they were sent an email request asking them to participate in a focus group about their experience working in the HUB program. If they chose to participate, researchers sent them a consent form by their preferred method (mail, email, text link to Adobe Sign). This focus group was conducted by video conference call and lasted approximately one (1) hour. The questions for HCNO staff focused on the programmatic structure, procedures, agency relations, and CHW support provided through the HUB. A full list of the focus group questions is included in Appendix VI. All members of the research team participated in this focus group, which was led by the PIs Justin Rex and Nichole Fifer. Participants were not offered any compensation for participating in this focus group.

6. Surveys with mothers with mothers currently participating in the HUB Program

Near the end of the interview process, a survey was developed to gather more information from both the mothers who were interviewed, and other mothers who are enrolled in Pathways, but did not interview in this study. This survey (Appendix VII) was distributed to mothers who had been interviewed in the study by the research team via text and email. HCNO aided in distributing the survey to Pathways participants who were not already in contact

with the research team. Because of the difficulty of reaching a population of mothers who frequently change phone numbers and addresses, recruitment happened via CHWs. The survey team sent the survey link to HCNO staff, who in turn sent it to their CHWs, and CHWs sent the link to their clients via text message. In total 119 mothers participated in a post survey. This primary data collection was coupled with the analysis of pre-existing historical program data obtained from HCNO.

7. Secondary Data from Pathways HUB Program

HCNO uses a software program called Care Coordination Systems (CSS) to enter data about the individuals in the HUB program. HCNO staff provided the research team with three separate datasets containing program data for enrolled clients for 2018-2020 (exact dates vary by dataset as detailed in the sections below). The first dataset provided data on births of enrolled clients, the second provided data on enrolled moms, and the third provided data on the Pathways moms completed while a client in the HUB. Each dataset included an anonymized client ID number to protect client identity and was used during the process of merging the datasets. The HUB contracts with Care Coordination Systems (CCS) to track client data. Because it is a client management system rather than a data management system intended for social scientific analysis, merging, and cleaning the data took considerable effort. The research team communicated with HCNO staff regularly to ask questions about the data, find and delete duplicates in the data, and correct any remaining errors. After the data was cleaned, the research team performed the descriptive, bivariate, and multivariate analyses described in the sections below to answer key questions about the factors that lead to pathway completion and positive birth outcomes.

Thematic Results

The results and findings from the data sources discussed above are presented in thematically grouped sections below. Because several of the sources can speak to a particular theme or question, we grouped them together. Data is organized under each section in the order of HUB Program Data, Participant Survey Data, Participant Interview Data, and Discussion. Stories and quotes from the interviews are interspersed throughout this analysis.

Demographics

This section presents demographic information about the study sample in each data source.

Hub Program Data

Most of the clients fall within the 19-34 age range, with a plurality being between the ages of 18-24 (35.5%), followed by 25-29 (29.3%) and 30-34 (21.2%) (Table 2).

Table 2: Client Age at Enrollment

Age Range	n	Percentage
<18	34	1.6%
18 – 24	766	35.5%
25 – 29	632	29.3%
30 – 34	456	21.1%
35 – 39	205	9.5%
40 – 44	59	2.7%
45 – 49	7	0.3%
Total	**2,159**	**100.00%**

Just over half of the clients are Black or African American, while a little over a third are white. (Table 3). The next most frequent racial identities are Black or African American, White, and Hispanic, Latino/a, or Spanish origin. The

other category represents 34 different racial or multiracial identities, all of which have fewer than 10 mothers and less than half a percent of the overall program participant population. About one tenth of clients are of Hispanic, Latino/a, or Spanish origin (11.4%), as seen in Table 4.

Table 3: Client Race

What is your race?

Race	n	Percentage
Black or African American	1,115	51.8%
White	809	37.6%
Black or African American, White	107	5.0%
Hispanic, Latino/a, or Spanish Origin	12	0.6%
Other	110	5.1%
Total	**2,153**	**100.00%**

Table 4: Client Ethnicity

Are you of Hispanic, Latino, or Spanish Origin?

Ethnicity	n	Percentage
Not of Hispanic, Latino, or Spanish origin	1,890	88.6%
Of Hispanic, Latino, or Spanish origin	6	11.4%
Total	**119**	**100.00%**

Participant Survey Data

A total of 125 survey responses were received. After deleting incomplete second responses from the same clients, a total of 119 survey responses were analyzed. Of the mothers who took the survey, 27 mothers (22.7%) were participants in the monthly in-depth interview portion of our study, whereas 92 mothers (77.3%) were sharing their experiences with the team for the first time and were recruited by the distribution of the survey link. The minimum age of survey respondents was 18 years, the maximum age was 68 years, and the mean age was 29.6 years. A majority of respondents fell between the ages of 18 and 29 (Table 5).

Table 5: Age of Survey Respondents

Age Range	n	Percentage
18 – 24	38	31.9%
25 – 29	24	20.2%
30 – 34	26	21.8%
35 – 39	21	17.6%
40 – 44	7	5.9%
45 – 49	1	0.8%
55+	1	0.8%
Missing	1	0.8%
Total	**119**	**100.00%**

The racial profile of the survey respondents is reported in Table 6 below. Over half (58.0%) of the respondents were Black or African American, while just under one-third identified as White (31.9%). To protect the anonymity of survey respondents, an 'Other' category was created and consists of mothers that identified as 'Other Asian,' 'Samoan,' and 'American Indian or Alaska Native.'

Table 6: Race of Survey Respondents

Race	n	Percentage
Black or African American	69	58.0%
White	38	31.9%
Multiracial – White & African American	8	6.7%
Other	4	3.4%
Total	**119**	**100.00%**

The ethnicity of the survey respondents is reported in Table 7 below. The majority (80.7%) of mothers were not of Hispanic, Latino, or Spanish origin.

Table 7: Ethnicity of Survey Respondents

Ethnicity	n	Percentage
Not of Hispanic, Latino, or Spanish origin	96	80.7%
Mexican, Mexican American, Chicano	7	5.9%
Another Hispanic, Latino, or Spanish Origin	6	5.0%
Puerto Rican	3	2.5%
Cuban	1	0.8%
Missing	6	5.0%
Total	**119**	**100.00%**

Participant Interview Data

A total of 41 mothers completed between one and seven in-depth interviews. Table 8 shows their age range. The plurality of mothers interviewed were between the ages of 25 and 29 (36.6%) with the next largest group being between the ages of 18 and 24 (31.7%).

Table 8: Age of Pathways Enrolled Mothers in the Study

Age Range	n	Percentage
18 – 24	13	31.7%
25 – 29	15	36.6%
30 – 34	8	19.5%
35 – 39	4	9.8%
40 – 44	1	2.4%
Total	**41**	**100.00%**

Slightly less than half of interviewees identified as Black or African American (46.3%) and just under a third were white (31.7%), as seen in Table 9 below.

Table 9: Race of Pathways Enrolled Mothers in the Study

Race	n	Percentage
Black or African American	19	46.3%
White	13	31.7%
Hispanic	4	9.8%
Multiracial	5	12.2%
Total	**41**	**100.00%**

Table 10 shows that a majority of mothers were either partnered (43.6%) or married (12.8%). Most of the additional mothers reported being single.

Table 10: Marital Status

Marital Status	n	Percentage
Single	16	41.0%
Partnered	17	43.6%
Married	5	12.8%
Divorced	1	2.6%
Total	**41**	**100.00%**

Discussion

There are similar demographic trends across the data sources, indicating that the survey and interview samples mirror the overall client demographics in the program.

Service/Pathway Utilization & Knowledge

HUB Program Data

When clients enroll in the Pathways HUB, they complete an initial checklist with their CHW to gather demographic information, potential risk factors, and establish the client's goals. From this information, clients can be enrolled in the appropriate pathways to meet their needs. Checklist questions are repeated at each monthly meeting to update any new risks or needs that arise. The research team was provided with data from the initial client enrollment checklist for mothers who enrolled between January 2018 and September 2020. From the initial checklist the research team established a risk profile based on the 25 risk factors clients are screened for, which include individual risk factors like smoking as well as social determinants of health like food and housing insecurity.

Chart 1 indicates the percent of mothers reporting the presence of each risk factor at enrollment. Having problems providing for themselves was the most prevalent risk factor (73.5%) followed by feeling stressed (49.4%) and having a family crisis in the previous year (49.3%).

For each pregnancy, risk factors were added to get a total number of risks present at enrollment. The mean number of risk factors is 6.47 (SD 3.13, mode 5, range 18). The average number of risk factors varies by the client's race (Table 11). A one-way analysis of variance shows a statistically significant difference between the means, substantively there is little difference, given the small sample size for some groups and the confidence intervals indicating the means overlap. Thus, there are not meaningful differences in the risk level of clients of different races.

Chart 1: Risk Factors at Enrollment

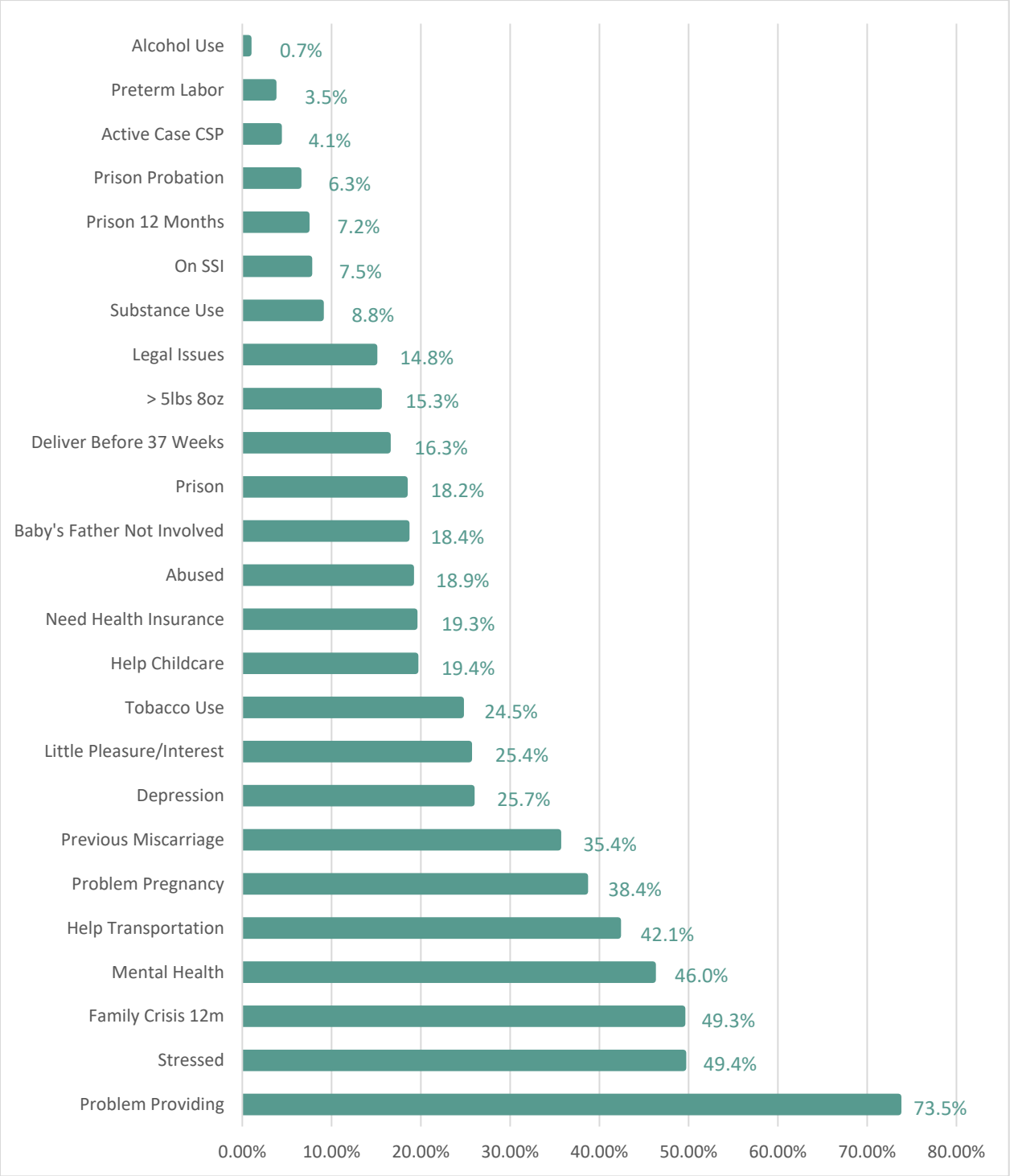


Table 11: Mean Number of Risk Factors at Enrollment by Race

	n	Mean	Standard Deviation	95% Confidence Interval for Mean		Minimum	Maximum
1 Black or African American	1,112	6.41	3.165	6.23	6.6	0	17
2 White	804	6.68	3.023	6.47	6.89	1	16
3 Black or African American, White	107	5.9	3.141	5.3	6.5	1	16
4 Hispanic, Latino/a, or Spanish Origin	12	4.75	3.166	2.74	6.76	2	12
5 Other	110	6	3.156	5.4	6.6	1	16
Total	**2,145**	**6.46**	**3.118**	**6.32**	**6.59**	**0**	**17**

Participant Survey Data

Respondents were asked a variety of questions to understand the effects participating in the HUB had on their mental wellbeing. First, mothers were asked to rank their stress level before and after enrolling in the HUB using a scale from 1 to 10, with 1 representing the lowest amount of stress and 10 representing the highest amount of stress. Table 12 shows that there was a substantively and statistically significant difference in the self-reported level of stress for women before enrolling in Pathways (M=7.12 SD = 2.66) and in the self-reported level of stress for woman after enrolling in Pathways (M = 3.43, SD = 2.07), t (114) = 14.08, $p < .001$.

Table 12: Stress Level Before and After Enrollment

Calculated Mean

	Mean
Stress before Pathways	7.1217
Stress after Pathways	3.4348

Table 13 shows the percentage of mothers whose stress decreased, increased, or stayed the same after enrolling in Pathways. Of the mothers who ranked their stress before and after Pathways enrollment, 87.8% reported a decrease in stress. The average increase was by 2.67 points on a scale of 1 to 10 and the average decrease was by 4.36 points on a scale of 1 to 10.

Table 13: Impact on Stress Level

Calculated by comparing stress before and after participation in Pathways

Impact on Stress	**n**	**Average Stress Level Change**	**Percentage**
Stress Decreased	101	-2.67	87.8%
No Change in Stress	8	0.00	7.0%
Stress Increased	6	4.36	5.2%
Total			**100.00%**

Table 14 further expands on how race affects whether mothers' stress levels increased, decreased, or stayed the same before and after enrolling in Pathways. The table indicates that there are no significant differences in how stress levels change based on race.

Table 14: Impact on Stress Level by Race

Impact on Stress by Race	Stress Decreased	No Change in Stress	Stress Increased	Total
Black or African American	60 (87%)	6 (8.7%)	3 (4.3%)	69
White	31 (91.2%)	1 (2.9%)	2 (5.9%)	34
Multiracial – White and AA	31 (91.2%)	1 (2.9%)	2 (5.9%)	8
Other	3 (75%)	0 (0.0%)	1 (25%)	4
Total	**101**	**8**	**6**	**115**

Table 15 displays the average changes in stress level by race. A one-way analysis of variance was performed to compare the effect of race on the change in stress levels of moms from before they enrolled in Pathways and after they enrolled in Pathways. This one-way analysis of variance shows that there was not a statistically significant difference in the change in stress levels between the groups, $F(3, 114) = 0.999$, $p = .396$; however, there were small substantive differences between groups.

Table 15: Average Changes in Stress by Race

Impact on Stress by Race	n	Average Stress Level Change	Standard Deviation
Black or African American	69	-3.52	2.62
White	34	-4.00	2.56
Multiracial – White and AA	8	-4.36	3.11
Other	4	-2.00	6.48
Total	**115**	**-3.69**	**2.81**

Respondents were also asked whether they agreed that their overall feelings of security, safety, hope, and isolation changed by being a client in the HUB Table 16. A majority of mothers said Pathways HUB participation increased or significantly increased their overall feelings of security (60.5%) and safety (55.5%), and a large majority said participation increased their sense of hope (79%). Slightly less than half of respondents said participation decreased or significantly decreased their feelings of isolation (47.9%).

Table 16: Change in Overall Feelings of Security, Safety, Hope, & Isolation

How has being in the Pathways HUB Program impacted your overall feelings of _____?

Overall Feelings of:	Significantly Decreased	Decreased	No Change	Increased	Significantly Increased	n
Security	7.0%	8.7%	21.7%	39.1%	23.5%	115
Safety	6.1%	4.3%	32.2%	35.7%	21.7%	115
Hope	5.2%	3.5%	9.6%	50.4%	31.3%	115
Isolation	13.8%	35.3%	31.0%	13.8%	6.0%	116

Participant Interview Data

The repeated interviews with mothers suggest that CHW's were a key contributor to decreasing stress and improving other indicators of mental wellbeing. CHW's were a person with whom to vent, share feelings with, and to unload some of the tasks that were causing mothers significant stress, such as navigating the social service system to receive cash or food assistance. A mother whose CHW helped her through a surgery said her stress was "impacted and helped a lot" by her CHW's help and caring. "The little stuff she did was big for me."

In terms of further well-being and support among study participants, interviewees were asked to describe their support networks. Table 17 categorizes the 53 responses from the 29 participating mothers who answered the

question. The most common responses/support networks included family, friends, partners and CHWs. Additional support networks mentioned included therapists, faith communities and neighbors. Several mothers reported attending a local program where pre- and post-partum mothers could go to take classes, find resources and talk with other parents.

Table 17: Support Networks

Overall Support Network	n	Percentage
Family	20	69.0%
Friends	11	37.9%
Partner	8	27.6%
CHW	7	24.1%
Has support network but no one specific mentioned	3	10.3%
Therapist	1	3.4%
Faith Community	1	3.4%
Neighbors	1	3.4%
No Support Network	1	3.4%
Total	**53**	

As it relates to the stress levels of mothers participating in the study, participants were asked over the seven interviews what they would rate their stress level on a scale of 1 to 10. Graph 1 below displays the change in the average stress level over each interview, and Table 18 further breaks down the data by providing the number of participants who provided a stress level for each interview, as well as what the average stress level was per interview.

Figure 1: Average Stress Levels of Study Participants

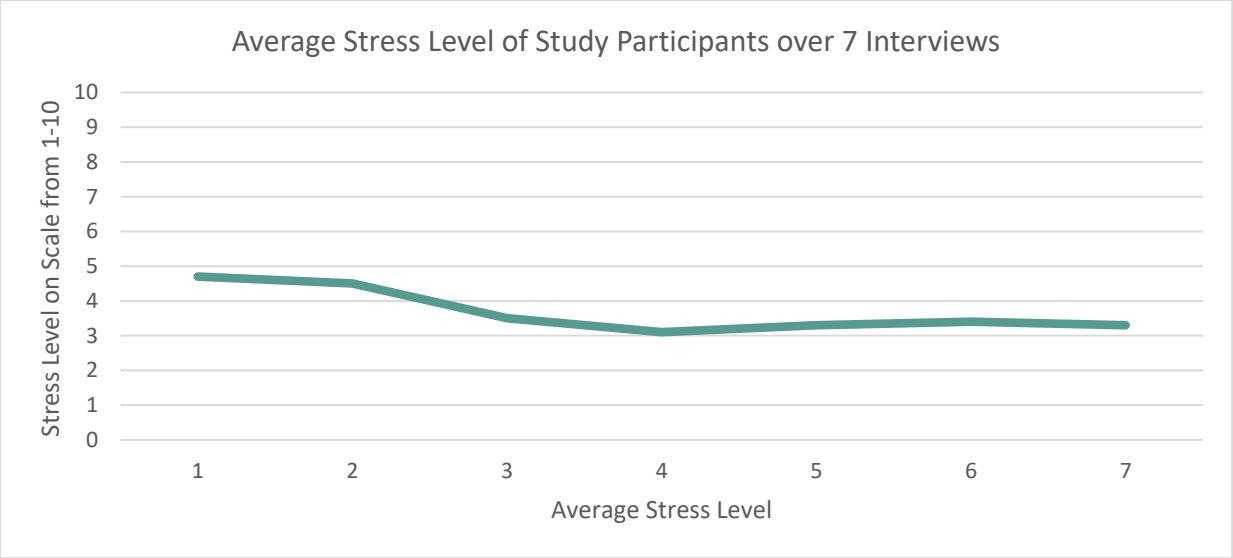


Table 18: Average Stress Level of Participant Per Interview

Number of Participants Who Provided Stress Level	n	Average Stress Level of Participants
1st Interview	28	4.7
2nd Interview	29	4.5
3rd Interview	28	3.5
4th Interview	26	3.0
5th Interview	21	3.3
6th Interview	17	3.4
7th Interview	13	3.4

Discussion

Stress is the second leading risk factor reported by mothers enrolling in the HUB. Stress is a known contributor to adverse maternal health and birth outcomes, particularly for Black mothers (Misra, 2010; National Academies of Sciences, 2020). The survey results suggest that HUB participation significantly decreased feelings of stress for a

large majority of mothers and interviews support this finding and suggest CHWs were key in achieving this decrease (Carter, et al., 2020). A mother remarked. "There was a program I tried to apply to. I think it was the [religious non-profit] building on [local street] … I heard about it through [CHW]. She gave me 2 different resources." While the interviews did not ask specifically about security, safety, or hope, anecdotal responses suggest that CHW's may have played a similar role here. Regarding isolation, and the more limited impact HUB enrollment had, additional data points suggest areas for additional HUB supports. In the survey, mothers were asked about their willingness to participate in groups that would bring together to socialize and learn from one another, and many indicated a willingness to participate in such a group. During interviews, some mothers spoke highly of programs and events that connected them with other (pregnant) moms, so adding a checklist question about isolation may be helpful. One mother reported, "I have another program I am about to start at the [local non-profit agency that serves pre- and postpartum moms]. I'm going to take their pregnancy class. I have attended it for my last 3 pregnancies. It's a program for pregnant moms and moms that already have kids…they feed you, they have on-site daycare, they give you these things called [paper dollars; they are earned by attending class and doing assignments] and you can shop in their little boutique for your kids, like you can get mostly all of your baby needs…it's through doing that that you come across parents that you can talk to about different things…]."

Pathways Services & Completion

HUB Program Data

The research team was provided with data on client pathways that were finished-incomplete, closed, or ongoing between 2018 and 2020, which included data for 3,825 pregnancy enrollments. During this time, clients and their CHWs opened 58,879 pathways. Clients completed 73.1% of these pathways (43,053) and while 24.5% (14,406) were closed without being completed, 2.4% (1,420) were still open/ongoing (Table 19). The most frequently opened pathways were Social Service Referrals (37.8%) and Education (36.9%), as seen in Table 20.

Table 19: Pathways Completion

	n	Percentage
Completed Pathways	43,053	73.1%
Incomplete Pathways	14,406	24.5%
Ongoing	1,420	2.4%
Total	**58,879**	**100.00%**

Table 20: Pathways Opened by Type

Pathway	n	Percent	Weight
Social Service Referral	22,283	37.8%	3
Education	21,748	36.9%	0.5
Medical Referral	4,020	6.8%	3
Pregnancy	1,670	2.8	20/24 (twins)
Postpartum	1,558	2.6	7
Housing	1,456	2.5	15
Medical Home	1,278	2.2	6
Family Planning	1,232	2.1	6
Tobacco Cessation	928	1.6	6
Health Insurance	759	1.3	6
Employment	716	1.2	10
Adult Learning	510	0.9	10
Behavioral Health	300	0.5	8
Immunization Screening	135	0.2	1
Medication Assessment	133	0.2	5
Immunization Referral	102	0.2	3

Developmental Referral	20	0.0	3
Lead	13	0.0	3
Medication Management	10	0.0	10
Developmental Screening	8	0.0	1
Total	**58,879**	**100**	

The research team also examined the service referrals associated with the main pathways categories shown above. Overall, the data represents 22,329 service referrals, with the most frequent referrals being to diaper bank (11.4% of referrals) and referrals for food assistance (9.6% of referrals) and transportation assistance (8.1% of referrals).

Table 21: Pathways Service Referrals

Referral	n	Percent of Cases
Diaper Bank	2,550	11.4%
Food Assistance	2,141	9.6%
Transportation Assistance	1,812	8.1%
Baby Items	1,516	6.8%
Other – Social Service Referral	1,478	6.6%
Cribs for Kids	1,416	6.3%
Financial Assistance	1,085	4.9%
Clothing Assistance	990	4.4%
WIC	983	4.4%
Car Seat	738	3.3%
Other	632	2.8%
Family Assistance	589	2.6%
Utilities Assistance	484	2.2%
Financial Assistance – TANF Support	459	2.1%
Pregnancy Center/Heartbeat/You First	409	1.8%

Insurance Assistance	400	1.8%
Housing Assistance	357	1.6%
Help Me Grow/Early Head Start	356	1.6%
Child Care Assistance	351	1.5%
Furniture Assistance	343	1.5%
Childbirth/Breastfeeding/Parenting	327	1.4%
Breast Pump	308	1.2%
Birth Certificates/IDs/SS Cards	277	1.1%
Legal Assistance	275	1.2%
Personal Care Items	271	1.0%
Education Assistance	234	0.8%
Housing Cleaning Supplies	186	0.8%
Household Items	170	0.7%
Domestic Violence Assistance	152	0.5%
Parent Education Assistance	116	0.5%
Budgeting/Financial Education	109	0.5%
Job/Employment Assistance	103	0.4%
Housing – Temporary Shelter	100	0.4%
Child Assistance	87	0.4%
Brothers United Fatherhood Program	83	0.4%
Tobacco/Smoking Cessation	82	0.4%
Translation Assistance	79	0.3%
Medical Debt Assistance	68	0.2%
Medication Assistance	31	0.1%
Household Major Appliances (i.e., stove)	28	0.1%
Household Small Items (i.e., linens)	27	0.1%
Support Group	25	0.1%
HCNO	24	0.1%

JFS	16	0.1%
Getting Ahead/Bridges Program	14	0.1%
Baby University	12	0.1%
FCC PEDS	11	0.0%
Total	**22,329**	**100.00%**

What type of pathways are most likely to be completed? Table 22 shows the type of pathway by completion status. The table also indicates the weighting assigned to each pathway type by the Pathways Community Hub Institute, which reflects the time and administrative expense needed to help clients complete the pathway. Education pathways are the most likely to be completed, by a significant margin. Because these pathways typically represent CHW's providing information to clients, it makes sense that these would be completed at a high rate and assigned a low weight given the relative ease of completing them. Given that these are the second-most frequent pathway opened, these are a key driver of the overall completion rate.

Some of our interview data provides some context for these trends. Many mothers spoke about the help they received in terms of reaching their educational goals: "After I finished [non-profit program for parents], [CHW] got me connected with [another non-profit agency] – that's how I got my laptop to use for school." Further, for social service referrals, clients frequently indicated difficulty reaching Job and Family Services to enroll in assistance programs (or sign up for health insurance). Even when clients were able to talk with someone, some ran into delays, lost information, or bureaucratic inconsistencies about records on the status of their case. Despite difficulties, several clients mentioned that their CHW was essential in getting them enrolled, sometimes after months of failed enrollment attempts by the client, which research shows is a common problem (Roland, et al., 2017). Moreover, a mother who was working with Lucas County Children's Services (CSB) reported, "If [CHW] wasn't part of my plan, I wouldn't have any proof of the things I am doing, I think that is one of the reasons I'm getting my son back because I have an extra voice. I was already doing half of the stuff on my own before I started working with [CHW] and not getting anywhere. I had proof but I didn't have that extra voice calling CSB vouching

for me." Housing too presented problems given the inadequate supply of affordable housing, the limited number of vouchers available, and other challenges further detailed in the housing section of this report.

Table 22: Pathway Type by Completion Status

	Percent Complete	Finished Incomplete	Completed	Ongoing	Total
Education	99.3%	141	21,587	20	32,748
Pregnancy	78.7%	297	1,314	59	1,670
Immunization Screening	71.9%	32	97	6	135
Family Planning	70.0%	335	862	35	1,232
Postpartum	68.9%	471	1,073	14	1,558
Health Insurance	66.1%	241	502	16	759
Social Service Referral	63.9%	7,569	14,234	480	22,283
Immunization Referral	62.7%	28	64	10	102
Medical Referral	54.2%	1,617	2,180	223	4,020
Behavioral Health	39.3%	168	118	14	300
Medication Assessment	36.1%	82	48	3	133
Developmental Referral	30.0%	14	6	0	20
Housing	26.0%	923	378	155	1,456
Medical Home	25.2%	803	322	153	1,278
Employment	24.6%	466	176	74	716
Lead	23.1%	9	3	1	13
Medication Management	20.0%	8	2	0	10
Developmental Screening	12.5%	7	1	0	8
Adult Learning	7.3%	397	37	76	510
Tobacco Cessation	5.3%	798	49	81	928
Total	**73.1%**	**14,406**	**43,053**	**1,420**	**58,879**

While Table 22 examines pathways at a program level, individual-level indicators of pathway completion provide additional context (Table 23). The average (mean) client opened 15.4 pathways per pregnancy and completed 64%, or 11.3 pathways, as seen in Table 23 below. Using the weighted system utilized by the NWO Pathways Hub, the average (mean) client opened pathways with a combined weight of 51.8 per pregnancy and completed 51.45% of these weights, or 29.9 pathway weights, as seen in Table 23 below.

Table 23: Descriptive Statistics by Pathway Completion Status

	Pathways Opened	Pathways Complete	Percent of Pathways Complete	Pathways Opened (Weighted)	Pathways Complete (Weighted)	Percent of Pathways Complete (Weighted)
Mean	15.5	11.3	64.86%	51.8	29.9	51.45%
Mode	4	1	100.0%	0.5	0.5	100.0%
Standard Deviation	15.5	13.1	27.25%	45.4	34.1	33.02%
Range	160	137	100.0%	471.0	368.5	100.0%
Minimum	1	0	0.00%	0.5	0.0	0.00%
Maximum	161	137	100.0%	471.5	368.5	100.0%

Almost half of clients completed 75% or more of their enrolled pathways per pregnancy, as indicated in Table 24. The completion status by the weight assigned to each pathway (the proportion of pathway weights opened that were completed shows lower completion rates. These differences indicate the challenges associated with completing higher weight pathways, given that they take more administrative resources and work on behalf of the client and CHW.

Table 24: Proportion of Pathways Completed

	n	Percent	n (Weighted)	Percent (Weighted)
0 – 24%	359	9.4%	1,074	28.2%
25 – 49%	536	14.1%	592	15.6%
50 – 74%	1,159	30.5%	1,033	27.1%
75 – 100%	1,751	46.0%	1,106	29.1%
Total	**3,805**	**100.0%**	**3,805**	**100.0%**

When comparing completion across different groups, the results do not show meaningfully significant differences between the most represented groups; almost half of Black or African American, White, and multiracial (Black and White) clients are completing 75-100% of their pathways, as seen in Table 25. The chi-squared test run for Table 25 supported a lack of a significant relationship (Pearson Chi Square = 15.419, p = 0.219). Table 26 shows lower completion percentages based on pathway weights, but similar percentages across racial groups. Again, the chi-squared test run on Table 26 also showed that the relationships were not statistically significant (Pearson Chi Square = 10.145, p = 0.603).

Table 25: Proportion of Pathways Completed by Race (Unweighted)

Race	0 – 24%	25 – 49%	50 – 74%	75 – 100%	Total
Black or African American	77 (7.0%)	138 (12.5%)	358 (32.4%)	533 (48.2%)	1,106
White	52 (6.5%)	108 (13.4%)	265 (33.0%)	378 (47.1%)	803
Black or African American, White	12 (11.3%)	15 (14.2%)	31 (29.2%)	48 (45.3%)	106
Hispanic, Latino/a, or Spanish Origin	1 (8.3%)	3 (25.0%)	4 (33.3%)	4 (33.3%)	12
Other	9 (8.1%)	13 (11.7%)	27 (24.3%)	62 (55.9%)	111
Total	**151 (7.1%)**	**277 (13.0%)**	**685 (32.0%)**	**1,025 (47.9%)**	**2,138 (100.0%)**

Table 26: Proportion of Pathway Weights Completed by Race (Weighted)

Race	0 – 24%	25 – 49%	50 – 74%	75 – 100%	Total
Black or African American	257 (23.2%)	148 (13.4%)	359 (32.5%)	342 (30.9%)	1,106
White	184 (22.9%)	120 (14.9%)	260 (32.4%)	239 (29.8%)	803
Black or African American, White	33 (31.1%)	13 12.3%)	23 (21.7%)	37 (34.9%)	106
Hispanic, Latino/a, or Spanish Origin	5 (41.7%)	3 (25.0%)	2 (16.7%)	2 (16.7%)	12
Other	23 (20.7%)	11 (9.9%)	37 (33.3%)	40 (36.0%)	111
Total	**502 (23.5%)**	**295 (13.8%)**	**681 (31.9%)**	**660 (30.9%)**	**2,138 (100.0%)**

Table 27 shows the average (mean) days to complete a pathway broken down by type of pathway, sorted in descending order (Note, this table excludes incomplete and ongoing pathways). Housing (179 days), tobacco cessation (159 days), and adult learning (138 days) took the longest to complete on average.

Table 27: Mean Days to Completion by Pathway Type

Pathway	n	Mean	Standard Deviation	Minimum	Maximum
Housing	360	179.65	98.43	9	642
Tobacco Cessation	49	159.94	115.425	0	601
Adult Learning	37	138.38	146.2	0	558
Pregnancy	1,314	130.15	60.493	0	255
Employment	176	114.88	68.506	13	356
Behavioral Health	118	76.81	64.036	0	335
Medical Home	322	72.2	96.512	0	538
Developmental Referral	6	62.17	36.373	15	116
Medical Referral	2,180	40.1	54.765	0	553

Postpartum	1,071	39.29	17.886	0	152
Family Planning	861	38.54	48.375	0	409
Immunization Referral	64	33.88	53.759	0	378
Health Insurance	501	30.55	47.601	0	544
Medication Management	2	29	9.899	22	36
Medical Assessment	48	27.23	87.971	0	444
Lead	3	26.67	28.676	0	57
Social Service Referral	14,234	25.56	41.034	0	609
Immunization Screening	97	9.97	25.679	0	160
Education	21,553	0.12	1.997	0	95
Developmental Screening	1	0		0	0
Total	**42,997**	**19.78**	**45.43**	**0**	**642**

What is the relationship between length of enrollment in the HUB and the number of pathways completed? We would expect clients enrolled for a longer time to complete more pathways. A previous evaluation of the HUB's adult client program found a positive relationship between enrollment length and pathways completed. A comparison of the average (mean) number of pathways completed by trimester enrolled indicates that there are substantive and statistically significant differences: earlier enrollment is correlated with completing more pathways and more weighted pathways (Table 28).[1] The relationship between time of enrollment and weighted pathway completion is particularly important because these are more time-consuming pathways to complete but can make larger impacts for clients as a result.

[1] The finding of earlier enrollment being associated with increased pathway completion is supported by a multinomial logistic regression model that held other variables constant (race, ethnicity, and census tract risk level for infant mortality) but should be interpreted with caution due to some dependent variable subpopulations having zero frequencies in some cells, which could not be resolved with the existing data. This model is not therefore included here.

Table 28: Mean Pathways Completion by Trimester Enrolled

Trimester	n	Mean	Standard Deviation	Min	Max	n (Weighted)	Mean (Weighted)	Standard Deviation (Weighted)	Min. (Weighted)	Max. (Weighted)
1st	390	23.34	17.376	0	134	389	65.860	40.499	0.5	368.5
2nd	624	17.69	13.952	0	137	624	54.211	32.501	0.0	301.5
3rd	303	13.38	11.354	0	77	302	45.987	27.928	0.0	185.5
Total	**1,317**	**18.37**	**14.975**			**1,315**	**55.768**	**34.887**		

Participant Survey Data

Respondents were asked which services they have received working with their CHW, and to check all that apply. Table 29 shows that the services most utilized were social/financial support systems, such as WIC, Food Stamps, and TANF, as well as housing assistance. Social service pathways support mirrors trends in the program dataset.

Table 29: Services Utilized by Participants

What services have you received through your participation with the Pathways HUB program (working with your Community Health Worker (CHW)? Please check all that apply.

Service	Yes	n
Accessing social/financial support systems (WIC, Food Stamps, TANF, etc.)	69.6%	80
Housing Assistance	36.5%	42
Accessing medical insurance (Medicaid)	32.2%	37
Accessing mental health services	32.2%	37
Access to education and training opportunities	31.3%	36
Finding a doctor (primary care doctor, OBGYN, Pediatrician)	30.4%	35
Access to transportation	14.8%	17
Other	14.8%	17
Access to employment	13.9%	16

Access to childcare	12.2%	14

The above survey question and the program data provide some understanding about pathway completion/incompletion. The survey also asked about awareness of core HUB pathway services offered to understand a different dynamic pathway underutilization. Respondents were asked whether they were aware of particular services and selected yes or no for each. The results in Table 30 show that the top four (4) services mothers were aware of were: help finding daycare, help talking to doctors and medical care providers, employment services, and career and education support. The services that mothers were least aware of included appliances, furniture, help getting a driver's license, and legal aid.

Table 30: Awareness of Services

Did you know that the Pathways HUB program can help with these things?

Service	Yes	No	n
Help finding daycare	89.3%	10.7%	103
Help talking to doctors and medical care providers	85.0%	15.0%	107
Employment Services	83.2%	16.8%	107
Career and education support	82.9%	17.1%	105
Help finding doctors or medical care providers	74.5%	25.5%	106
Support services for abuse and trauma survivors	72.6%	27.4%	106
Help understanding financial aid for higher education	67.9%	32.1%	106
Help understanding financial aid for higher education	67.9%	32.1%	106
Access to a midwife or doula	67.3%	32.7%	104

Information & access to free healthy living resources such as classes on healthy cooking, weight management, and health maintenance	60.6%	39.4%	104
Assistance with child support and custody	56.2%	43.8%	105
Legal aid	47.2%	52.8%	108
Help getting a driver's license	45.8%	54.2%	107
Furniture	45.1%	54.9%	113
Appliances	36.7%	63.3%	109

One interpretation of a lack of knowledge about certain core services is that their CHW did not tell them about particular resources because they never indicated a need for them when answering checklist questions. Alternatively, mothers may have needs that go unmet due to a lack of awareness. For example, during one interview a mother mentioned struggling with bills in part because her previous landlord kept the entire security deposit without cause. When the research team interviewer mentioned that her CHW could connect her to legal aid, she was unaware that this was a possibility.

Participant Interview Data

The study participants who completed the final interview were asked a variety of broad questions regarding their participation in the Pathways program. One of those questions asked about their overall understanding of the purpose of the program. Table 31 categorizes the 29 responses provided across 13 interviewees. The most common responses given by participants was that the main purpose of Pathways was providing general overall assistance to the individuals participating in the Pathways program. Several mothers also placed emphasis on general resource provision, as well as help finding resources they might not have known about otherwise. Other responses included keeping mothers and babies healthy, as well as helping them to navigate social service programs. One mother remarked, "[My CHW's] focus has been on both my needs and the baby's needs. Before I had the baby, she was making sure that I had what I needed to make sure the baby was safe."

Table 31: Program Purpose

What would you say the main purpose of the Pathways program is?

Perceived Purpose of Pathways	n	Percentage
General overall assistance	8	44.4%
Resource provision	5	27.8%
Keeping babies healthy	5	27.8%
Finding/providing new or unknown resources	4	22.2%
Keeping moms healthy	4	22.2%
Helping to keep all families healthy	4	22.2%
Navigating social programs (WIC, JFS, etc.)	2	11.1%
Childcare	1	5.6%
Total	33	

Mothers were also asked about the biggest benefit they received as part of their participation in the Pathways HUB. Table 32 details the 26 responses provided by the 13 interviewees. The most common responses provided by mothers included resource provision, including receiving diapers, food, baby wipes and clothes from their CHWs. Having the support from a CHW was also one of the most common responses. Additional responses included knowledge of resources, helping to navigate social service programs, receiving a pack and play from their CHW, and general help that they were able to receive.

Table 32: Biggest Benefit from HUB Participation

What was the biggest benefit you got from being a part of the Pathways HUB?

Biggest Benefit of Participating in Pathways	n	Percentage
Provision of diapers	5	38.5%

Support from CHW	5	38.5%
Provision of formula, food for family, baby wipes, and clothes	5	38.5%
General resource provision	3	23.1%
Knowledge of resources	3	23.1%
Help navigating social service programs	2	15.4%
Receiving a Pack and Play	2	15.4%
General help	1	7.7%
Total	26	

Mothers were also asked what advice they had for any future mothers who would go through the Pathways HUB program. Table 33 displays responses given by the study participants. The two most common responses were the general recommendation to do the program, as well as to not be afraid to ask for help. Participants also provided advice to participate in outside programs they had benefitted from, advice to be honest with CHWs, and to take advantage of the help and resources being offered to them. A mother who had been in the HUB with her previous child had the same CHW for both pregnancies. "I did it through pregnancy/infancy with my (previous) son. Then [CHW] would communicate with me but I didn't have needs again until I got pregnant with my daughter. She got me connected to … the STNA classes and clinicals and state test. [That] should help with CHW career path."

Table 33: Advice for Future Clients

Do you have any advice for future mothers who go through the program?

Biggest Benefit of Participating in Pathways	**n**	**Percentage**
Recommendation to do program in general	3	30.0%
Don't be afraid to ask for help	3	30.0%
Other	2	20.0%
Other outside resources (i.e., the Pregnancy Center)	1	10.0%

Be honest with CHW about needs	1	10.0%
Take advantage of the help/resources being offered	1	10.0%
Total	11	

Discussion

Taken together, the results show that clients complete a significant portion of their pathways, which will contribute to a reduction in the risks associated with adverse maternal and birth outcomes. Though high completion rates are partially driven by a near perfect completion rate for education-focused pathways, which may be relatively easier to complete, the lower completion rates for other pathways are not necessarily an indicator of problems with the Pathways HUB. Failure to complete pathways can be driven by larger social dynamics outside the HUB and CHWs control, such as a limited supply of housing vouchers or the inherent difficulty associated with getting mothers to cease an addictive behavior like smoking. One small place for improvement is decreasing gaps between the needs of moms and awareness of the resources that could assist them.

Housing

Survey Data

As reported above, 36.5% of respondents reported utilizing Pathways' housing assistance resources. The survey included additional questions about housing challenges to understand these better. Overall, over one quarter of respondents (27.7%) struggled to find or stay in safe and affordable housing (Table 34).

Table 34: Safe and Affordable Housing

Have you struggled to find or be able to stay in safe and affordable housing?

	n	Percentage
No	81	71.1%
Yes	33	28.9%

Survey respondents were also asked if they had ever been evicted by formal eviction notice. Table 35 shows that 22.9% of respondents had been evicted by a formal eviction notice and 8.3% of respondents were unsure. However, a majority of survey respondents (68.8%) had never been evicted by a formal eviction notice.

Table 35: Eviction

Have you ever been evicted by formal eviction notice?

Evicted?	n	Percentage
No	75	68.8%
Yes	25	22.9%
Not sure	9	8.3%
Total	**109**	**100.0%**

Mothers were asked to indicate barriers they faced in finding safe and affordable housing (Table 36). The most frequently cited barriers were not being able to find affordable housing that fit their income (57.9%) or being able to find housing that was safe (34.2%) or well maintained (31.6%). A mother reported struggling with her housing situation. “We’re still living in the same place. I’m looking for a house. I want a house because [Baby] like to be outside. I don’t feel that it is safe for us to be outside where we are at right now. I heard about violence, such as shootings and arguments.”

Table 36: Housing Issues

What barriers have you faced with finding/staying in housing? (Please check all that apply.)

	n	Percentage
Can’t find anything affordable on my income	44	57.9%
Affordable units are in places I consider unsafe	26	34.2%
Affordable units are poorly maintained and unhealthy for myself and my children	24	31.6%
Housing denied due to poor credit	23	30.3%

Housing denied due to history of eviction	10	13.2%
Housing denied due to criminal history	8	10.5%
Affordable units are in places that limit my transportation options	7	9.2%
Total	**142**	

The survey also asked mothers whether they left a rental due to unsafe conditions that their landlord would not fix, and one-fifth of mothers (20.4%) said yes Table 37.

Table 37: Landlord Issues

Have you left a rental due to unsafe conditions that the landlord would not fix?

	n	Percentage
No	90	79.6%
Yes	23	20.4%

If respondents answered "Yes" to the question above, they were asked to select which conditions the landlord failed to address (Table 38). The most frequently cited condition was noisy or problematic neighbors (40.4%), followed by rodents, mold, and plumbing issues. One mother reported, "The landlord was not on top of maintenance. Out of my $900 deposit I only got back $95. The landlord said, 'take me to court.'"

Table 38: Conditions Unaddressed

What conditions were unaddressed by the landlord?

	n	Percentage
Noisy or problematic neighbors	21	40.4%
Rodents (mice, rats) or other pests (including bugs)	19	36.5%
Mold	17	32.7%

Plumbing issues	14	26.9%
Heating issues	11	21.2%
Chipping paint	8	15.4%
Broken doors or locks	8	15.45%
Broken or leaking windows	8	15.4%
Electricity issues	6	11.5%
Non-working appliances (stove or refrigerator)	5	9.6%
Cooling/air conditioning issues	4	7.7%
Broken stairs or handrails	3	5.8%
Leaking roof	3	5.8%
Total	**127**	

Participant Interview Data

A number of study participants provided in-depth housing information, including whether they had been evicted, their biggest stressors when it came to housing, as well as information on their current and previous landlords (if applicable). Tables 34 through 41 show how study participants responded to these questions.

Table 39 shows that, of the 24 study participants who provided in-depth housing information, a majority (62.9%) had never been evicted. However, Table 40 shows that, of the 12 participants who answered the question regarding landlord discrimination, results were more evenly split, with 41.7% indicating that they had been discriminated against by a landlord.

Table 39: Eviction Status

Evicted?	n	Percentage
Yes	8	33.3%

No	15	62.5%
Not sure	1	4.2%
Total	24	100.0%

Table 40: Landlord Discrimination

Landlord discrimination?	n	Percentage
Yes	5	41.7%
No	6	50.0%
Not sure	1	8.3%
Total	12	100.0%

Table 41 details the 26 responses given by 18 of the study participants regarding experiences with their current landlord for those interviewees living in rental housing. The most common responses were that landlords were un-responsive, or respondents did not frequently see their landlord.

Table 41: Experience with Current Landlord

Experience with Current Landlord	n	Percentage
Non-responsive	5	27.8%
Doesn’t see landlord frequently	5	27.8%
Unfair	4	22.2%
Threatening	3	16.7%

Positive/Nice	2	11.1%
Other	2	11.1%
Fair	1	5.6%
Responsive	1	5.6%
Communication concerns	1	5.6%
Discriminating	1	5.6%
No concerns with landlord	1	5.6%
Total	**26**	

Table 42 displays the 19 responses given by 16 study participants who provided a response regarding experiences they had with a previous landlord (if applicable). Some similar responses were seen, with some respondents answering that previous landlords had been non-responsive, unfair, not seen frequently, positive/nice or discriminating. One mother had previously lived in low-income housing for 2 years. She said, "I liked that it was a townhome in a decent location with a little backyard for the kids. My dislikes were that I didn't feel safe because of the crime, my neighbors were not friendly, and the management was rude. I left because the office manager [did not follow through with notifying JFS about her pay raise]. I ended up owing over $500 which is still on my credit report. It was unfair. I moved before they could evict me."

Table 42: Past Landlord Experiences

Experience with Past Landlord(s)	n	Percentage
No previous concerns	9	52.9%
Non-responsive	3	17.6%
Unfair	2	11.8%
Other	2	11.8%
Doesn't see landlord frequently	1	5.9%
Positive/nice	1	5.9%

Discriminating	1	5.9%
Total	19	

Thirty-six study participants provided information on major housing stressors affecting them. Table 43 displays the 46 responses given by the participants. The most common answer given by participants was that they did not have any concerns regarding their housing situation (43.2%). Other common responses included living in dangerous neighborhoods, issues with landlords, "my landlord is trying to evict me without telling me why," an inability to find new housing to move to, maintenance concerns, being able to pay rent or other living expenses, issues with neighbors, and issues with rodents "I moved from a bad housing situation to a [public housing authority] rental where I still had issues with rodents."

Table 43: Past Housing Stressors

Housing Stressors	**n**	**Percentage**
No concerns	16	43.2%
Dangerous neighborhood	6	16.2%
Landlord issues	5	13.5%
Other	5	13.5%
Unable to find new housing	4	10.8%
Maintenance concerns	3	8.1%
Paying rent	2	5.4%
Paying bills (water, electricity, gas, etc.)	2	5.4%
Neighbors	2	5.4%
Rodents	1	2.7%
Total	46	

Seventeen study participants responded to the researchers' questions on if they had experienced housing struggles during/after their most recent pregnancy. Table 44 displays how these 17 participants answered. Most of the respondents (52.9%) did not experience housing struggles during or after their most recent pregnancy; however, 6 of the 17 respondents had experienced housing struggles during their most recent pregnancy, with one mom stating that she was homeless for at least two years, and when she went to the shelter, she was already seven months pregnant. 2 of the 17 respondents had experienced housing struggles after their most recent pregnancy, with one mom indicating that, after falling behind on rent due to her maternity leave, her landlord was threatening to charge her both a late fee and the cost to file an eviction against her if she did not pay her rent by a certain date and time.

Table 44: Did you have housing struggles during/after your most recent pregnancy?

Housing Struggle during most recent pregnancy	n	Percentage
Yes, during pregnancy	6	35.3%
Yes, after pregnancy	2	11.8%
No	9	52.9%
Total	17	100.0%

Table 45 displays responses from 9 mothers who were asked the same question about their previous pregnancies. A majority did not experience housing struggles or were either pregnant with or had just had their first child; however, one respondent indicated that she had experienced housing struggles during her previous pregnancy. One other respondent indicated that she had experienced housing struggles both during and after her previous pregnancies, mentioning that she had been homeless and living out of her car when she found out she was pregnant with her first baby and had struggled with paying bills and having to walk miles to work while pregnant with her second baby due to not having a car.

Table 45: Did you have housing struggles during/after previous pregnancies?

Housing Struggle during previous pregnancies	n	Percentage
Yes, during previous pregnancy	1	11.1%
Yes, during and after	1	11.1%
No	7	77..8%
Total	9	100.0%

Discussion

Housing is a significant social determinant of health for mothers and their children. The data above indicate that a variety of housing struggles are present for a large, but numerical minority of mothers. Some of these struggles are immediate threats to mothers and children, like persistent mold landlords fail to remove, while others contribute to mental health issues, like the inability to find alternative housing leaving moms to remain in housing in an unsafe and violent neighborhood. The presence of these issues shows the benefits the CHW-based pathway model provides when they can connect mothers to needed resources, but also the limitations of this model within a region and country experiencing an affordable housing crisis. That said, the presence of landlord and housing issues that go unaddressed and are fixable in the short term indicates potential opportunities for CHWs to help mothers advocate for themselves with landlords and rental companies. This is similar to the way CHWs assist with social service enrollment difficulties or attending medical appointments or creating pathway options to help mothers find advocates to assist with their landlord-related housing struggles. One CHW provided information assistance to one of her clients, “she told me about escrow and about how to break the lease legally.”

Participant Attitudes toward Medical Services & Providers

Participant Survey Data

Respondents were asked several questions about their relationship with their primary care and family doctor, Gynecologist (OBGYN), and children's pediatrician. Respondents were asked how much they agree with a series of statements for each type of doctor regarding trust, comfort, and feelings of judgement. For their primary or family doctor, around three-fourths of mothers agree or strongly agree that they receive good medical care, are diagnosed properly, feel comfortable sharing their medical history and needs, and feel heard and validated (Table 46). Additionally, a majority of mothers disagree or strongly disagree when asked if they feel like their doctor judges them because of their race/ethnicity, income, occupation, or education.

Table 46: Participant Attitudes Toward Primary Care/Family Doctor

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
I trust my primary care/family doctor to provide me with good medical care	0.9%	0.9%	13.4%	25.0%	59.8%
I trust my primary care/family doctor to accurately diagnose illness and prescribe appropriate treatments	0.9%	1.8%	15.2%	20.5%	61.6%
I feel completely comfortable telling my primary care/family doctor about my full medical history	0.0%	0.9%	12.5%	14.3%	72.3%
I feel completely comfortable telling my primary care/family doctor about my health concerns and needs	0.9%	0.0%	11.6%	14.3%	73.2%
I feel heard and validated by my primary care/family doctor	8.1%	1.8%	11.7%	22.5%	55.9%

I feel like my primary care/family doctor judges me negatively because of my history and/or current personal struggles	53.6%	9.8%	18.8%	7.1%	10.7%
I feel like my primary care/family doctor judges me negatively because of my race or ethnicity	67.6%	5.4%	14.4%	3.6%	9.0%
I feel like my primary care/family doctor judges me negatively because of my income	66.1%	5.4%	14.3%	7.1%	7.1%
I feel like my primary care/family doctor judges me negatively because of my occupation	67.0%	4.5%	17.0%	5.4%	6.3%
I feel like my primary care/family doctor judges me negatively because of my education	66.1%	6.3%	17.0%	4.5%	6.3%

Mothers were given the same set of statements for their OBGYN (Table 47). A small but meaningfully higher percentage of mothers strongly agree with statements about care, trust, and comfort when compared to their opinions of their family doctor. Similarly, higher percentages of respondents strongly disagree with statements about whether their OBGYN judges them negatively compared to the same statements about their family doctor.

Table 47: Participant Attitudes Toward OBGYN

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
I trust my OBGYN to provide me with good medical care	0.9%	1.8%	8.9%	12.5%	75.9%
I trust my OBGYN to accurately diagnose illness and prescribe appropriate treatments	0.9%	2.7%	14.3%	10.7%	71.4%
I feel completely comfortable telling my OBGYN about my full medical history	1.8%	1.8%	9.0%	6.3%	81.1%
I feel completely comfortable telling my OBGYN about my health concerns and needs	0.9%	3.6%	8.9%	8.0%	78.6%
I feel heard and validated by my OBGYN	8.0%	3.6%	11.6%	10.7%	66.1%
I feel like my OBGYN judges me negatively because of my history and/or current personal struggles	68.8%	4.5%	12.5%	4.5%	9.8%
I feel like my OBGYN judges me negatively because of my race or ethnicity	76.8%	1.8%	11.6%	1.8%	8.0%
I feel like my OBGYN judges me negatively because of my income	76.8%	1.8%	11.6%	1.8%	8.0%
I feel like my OBGYN judges me negatively because of my income, occupation, or education	72.3%	1.8%	14.3%	3.6%	8.0%

Respondents were asked the same questions about their child/children's pediatrician, as reported below in Table 48. Their responses track closely with those for their family care doctor: about three-fourths of mothers agree or strongly agree that they receive good medical care, are diagnosed properly, feel comfortable sharing their medical history and needs, and feel heard and validated. Fewer mothers strongly agree with these statements about pediatricians compared to the same for their OBGYN. Further, most mothers disagree or strongly disagree when asked if they feel like their doctor judges them because of their race/ethnicity, income, occupation, or education, which closely track the percentages for primary care doctors. One response was, "I have had this doctor since my first child [when she was 19 years old – she is 38 now]. I just deal with [local health care system] and it is an awesome health care system. They have this way of answering all your questions and finding solutions until the problem is fixed. My kids have never been in the hospital…never even had chicken pox. I just love them."

Table 48: Participant Attitudes Toward Pediatrician

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
I trust my child/children's pediatrician to provide me with good medical care	1.8%	0.9%	13.6%	15.5%	68.2%
I trust my child/children's pediatrician to accurately diagnose illness and prescribe appropriate treatments	0.9%	0.0%	15.5%	13.6%	70.0%
I feel completely comfortable telling my child/children's pediatrician about my concerns about my children	0.0%	0.0%	11.8%	14.5%	73.6%
I feel heard and validated by my child/children's pediatrician	7.4%	0.0%	18.5%	16.7%	57.4%
I feel like my child/children's pediatrician judges me negatively because of my history and/or current personal struggles	65.1%	0.0%	18.3%	11.0%	5.5%

I feel like my child/children's pediatrician judges me negatively because of my race or ethnicity	72.5%	3.7%	15.6%	2.8%	5.5%
I feel like my child/children's pediatrician judges me negatively because of my income, occupation, or education	70.9%	3.6%	15.5%	4.5%	5.5%

In reviewing the survey data further, cross tabulations were run to compare the racial breakdowns in responses regarding whether mothers felt judged because of their race/ethnicity, income, occupation, or education. The results from these cross tabulations can be seen in Table 49 through Table 59 below. While a majority of respondents did not feel judged in any way by their primary care physicians, OBGYNS, or pediatricians, these cross tabulations provided evidence of racial disparities in how mothers were responding, especially in relation to judgements based on race/ethnicity and history and or/current struggles. Evidence as such is discussed below:

- 10.4% of Black or African American mothers and 12.5% of Multiracial mothers strongly agreed with the statement that their primary care physician judged them based on their race/ethnicity compared to only 6.1% of White mothers.
- This difference was even more pronounced in relation to OBGYNs, with 11.5% of Black or African American mothers either somewhat agreeing or strongly agreeing that they were being judged based on their race/ethnicity, 12.5% of Multiracial mothers strongly agreeing, and only 5.9% of White mothers strongly agreeing.
- This same difference persisted with pediatricians, with 9.4% of Black or African American mothers either somewhat agreeing or strongly agreeing that their child's pediatrician judged them based on their race/ethnicity, 12.5% of Multiracial mothers strongly agreeing, and only 5.8% of White mothers either somewhat agreeing or strongly agreeing.

As it relates to whether mothers felt judged based on their history and/or current struggles, racial disparities persisted. 20.9% of Black or African American mothers felt that their primary care physicians judged them based on

their history and/or current struggles, 16.4% answered the same in relation to their OBGYN, and 15.6% felt the same regarding their child's pediatrician. Comparatively, 14.7% of White mothers answered the same in relation to their primary care physician, 11.8% answered the same in relation to their OBGYN, and 14.7% felt the same in relation to their child's pediatrician.

In terms of overall negative experiences, when accounting for all groups, racial disparities are not seen, with a greater percentage of White mothers indicating that they had negative experiences with healthcare providers in the past when compared to Black or African American mothers, multi-racial mothers, and mothers identifying as Samoan. While 50% of respondents identifying as 'Other Asian' also answered that they had experienced negative experiences with healthcare providers in the past, this is based on only two mothers.

After examining the differences seen in the cross tabulations, chi-square tests of independence were run to assess the relationship between race and whether mothers felt judged by doctors because of their race/ethnicity, income, occupation, or education, which showed that most questions did not show statistically significant differences between groups. There were significant relationships only between race and mothers feeling that their primary care physicians judged them negatively based on their race or ethnicity (Pearson Chi Square = 38.296, $p = .001$), between race and mothers feeling that their primary care physicians judged them negatively because of their occupation (Pearson Chi Square= 28.630, $p = .027$), between race and mothers feeling that their OBGYN judged them negatively based on their race or ethnicity (Pearson Chi Square = 64.070, $p < .001$), and lastly, between race and mothers feeling that their child/children's pediatrician judged them negatively because of their income, occupation, or education (Pearson Chi Square = 37.997, $p = .002$).

Primary Care Doctor Judgements Based on Race

Table 49: Cross tabulation comparing the racial differences in responses to the statement "I feel like my primary care doctor judges me negatively because of my race or ethnicity."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	46 (68.7%)	3 (4.5%)	10 (14.9%)	1 (1.5%)	7 (10.4%)	67
Asian and Pacific Islander	1 (33.3%)	1 (33.3%)	0 (0.0%)	1 (33.3%)	0 (0.0%)	3
White	23 (69.7%)	1 (3.0%)	5 (15.2%)	2 (6.1%)	2 (6.1%)	33
Multiracial – White & African American	5 (62.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	8
Total	75 (67.6%)	6 (5.4%)	16 (14.4%)	4 (3.6%)	10 (9.0%)	111 (100.0%)

Table 50: Cross tabulation comparing the racial differences in responses to the statement "I feel like my primary care doctor judges me negatively because of my history and/or current struggles."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	36 (53.7%)	7 (10.4%)	10 (14.9%)	6 (9.0%)	8 (11.9%)	67 (100.0%)
Asian and Pacific Islander	1 (33.3%)	1 (33.3%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	3 (100.0%)
White	19 (55.9%)	2 (5.9%)	8 (23.5%)	2 (5.9%)	3 (8.8%)	34 (100.0%)
Multiracial – White & African American	4 (50.0%)	1 (12.5%)	2 (25.0%)	0 (0.0%)	1 (12.5%)	8 (100.0%)
Total	60 (53.5%)	11 (9.8%)	21 (18.8%)	8 (7.1%)	12 (10.7%)	112 (100.0%)

Table 51: Cross tabulation comparing the racial differences in responses to the statement "I feel like my primary care doctor judges me negatively because of my income."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	45 (67.2%)	4 (6.0%)	9 (13.4%)	3 (4.5%)	6 (9.0%)	67 (100.0%)
Asian and Pacific Islander	1 (33.3%)	0 (0.0%)	0 (0.0%)	2 (66.7%)	0 (0.0%)	3 (100.0%)
White	23 (67.6%)	1 (2.9%)	6 (17.6%)	3 (8.8%)	1 (2.9%)	34 (100.0%)
Multiracial – White & African American	5 (62.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	8 (100.0%)
Total	74 (66.1%)	6 (5.4%)	16 (14.3%)	8 (7.1%)	8 (7.1%)	112 (100.0%)

Table 52: Cross tabulation comparing the racial differences in responses to the statement "I feel like my primary care doctor judges me negatively because of my education."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	45 (67.2%)	3 (4.5%)	11 (16.4%)	3 (4.5%)	5 (7.5%)	67 (100.0%)
Asian and Pacific Islander	1 (33.3%)	1 (33.3%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	3 (100.0%)
White	23 (67.6%)	2 (5.9%)	6 (17.6%)	2 (5.9%)	1 (2.9%)	34 (100.0%)
Multiracial – White & African American	5 (62.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	8 (100.0%)
Total	74 (66.1%)	7 (6.3%)	19 (17.0%)	5 (4.5%)	7 (6.3%)	112 (100.0%)

Table 53: Cross tabulation comparing the racial differences in responses to the statement "I feel like my primary care doctor judges me negatively because of my occupation."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	46 (68.7%)	2 (3.0%)	11 (16.4%)	4 (6.0%)	4 (6.0%)	67 (100.0%)
Asian and Pacific Islander	1 (33.3%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	1 (33.3%)	3 (100.0%)
White	23 (67.6%)	1 (2.9%)	7 (10.6%)	2 (5.9%)	1 (2.9%)	34 (100.0%)
Multiracial – White & African American	5 (62.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	8 (100.0%)
Total	75 (67.0%)	5 (4.5%)	19 (17.0%)	6 (5.4%)	7 (6.3%)	112 (100.0%)

OBGYN Judgements Based on Race

Table 54: Cross tabulation comparing the racial differences in responses to the statement "I feel like my OBGYN judges me negatively because of my history and/or current personal struggles."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	48 (71.6%)	1 (1.5%)	7 (10.4%)	3 (4.5%)	8 (11.9%)	67 (100.0%)
Asian and Pacific Islander	3 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (100.0%)
White	21 (61.8%)	3 (8.8%)	6 (17.6%)	2 (5.9%)	2 (5.9%)	34 (100.0%)
Multiracial – White & African American	5 (62.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	8 (100.0%)
Total	77 (68.8%)	5 (4.5%)	14 (12.5%)	5 (4.5%)	11 (9.8%)	112 (100.0%)

Table 55: Cross tabulation comparing the racial differences in responses to the statement "I feel like my OBGYN judges me negatively because of my race or ethnicity."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	53 (79.1%)	0 (0.0%)	7 (10.4%)	1 (1.5%)	6 (9.0%)	67 (100.0%)
Asian and Pacific Islander	2 (66.7%)	0 (0.0%)	0 (0.0%)	1 (33.3%)	0 (0.0%)	3 (100.0%)
White	26 (76.5%)	1 (2.9%)	5 (14.7%)	0 (0.0%)	2 (5.9%)	34 (100.0%)
Multiracial – White & African American	5 (62.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	8 (100.0%)
Total	86 (76.8%)	2 (1.8%)	13 (11.6%)	2 (1.8%)	9 (8.0%)	112 (100.0%)

Table 56: Cross tabulation comparing the racial differences in responses to the statement "I feel like my OBGYN judges me negatively because of my income, occupation, or education."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	51 (76.1%)	1 (1.5%)	7 (10.4%)	2 (3.0%)	6 (9.0%)	67 (100.0%)
Asian and Pacific Islander	2 (66.7%)	0 (0.0%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	3 (100.0%)
White	23 (67.6%)	0 (0.0%)	7 (20.6%)	2 (5.9%)	2 (5.9%)	34 (100.0%)
Multiracial – White & African American	5 (62.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	8 (100.0%)
Total	81 (72.3%)	2 (1.8%)	16 (14.3%)	4 (3.6%)	9 (8.0%)	112 (100.0%)

Pediatrician Judgements Based on Race

Table 57: Cross tabulation comparing the racial differences in responses to the statement "I feel like my child's pediatrician judges me negatively because of my history and/or current personal struggles."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	44 (68.8%)	10 (15.6%)		7 (10.9%)	3 (4.7%)	64 (100.0%)
Asian and Pacific Islander	1 (33.3%)	1 (33.3%)		1 (33.3%)	0 (0.0%)	3 (100.0%)
White	21 (61.8%)	8 (23.5%)		3 (8.8%)	2 (5.9%)	34 (100.0%)
Multiracial – White & African American	5 (62.5%)	1 (12.5%)		1 (12.5%)	1 (12.5%)	8 (100.0%)
Total	71 (65.1%)	20 (18.3%)		12 (11.0%)	6 (5.5%)	109 (100.0%)

Table 58: Cross tabulation comparing the racial differences in responses to the statement "I feel like my child's pediatrician judges me negatively because of my race or ethnicity."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	48 (75.0%)	3 (4.7%)	7 (10.9%)	2 (3.1%)	4 (6.3%)	64 (100.0%)
Asian and Pacific Islander	1 (33.3%)	0 (0.0%)	2 (66.7%)	0 (0.0%)	0 (0.0%)	3 (100.0%)
White	25 (73.5%)	0 (0.0%)	7 (20.6%)	1 (2.9%)	1 (2.9%)	34 (100.0%)
Multiracial – White & African American	5 (62.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	8 (100.0%)
Total	79 (72.5%)	4 (3.7%)	17 (15.6%)	3 (2.8%)	6 (5.5%)	109 (100.0%)

Table 59: Cross tabulation comparing the racial differences in responses to the statement "I feel like my child's pediatrician judges me negatively because of my income, occupation, or education."

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total
Black or African American	50 (76.9%)	2 (3.1%)	8 (12.3%)	1 (1.5%)	4 (6.2%)	65 (100.0%)
Asian and Pacific Islander	1 (33.3%)	0 (0.0%)	0 (0.0%)	2 (66.7%)	0 (0.0%)	3 (100.0%)
White	22 (64.7%)	1 (2.9%)	8 (23.5%)	2 (5.9%)	1 (2.9%)	34 (100.0%)
Multiracial – White & African American	5 (62.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)	1 (12.5%)	8 (100.0%)
Total	78 (70.9%)	4 (3.6%)	17 (15.5%)	5 (4.5%)	6 (5.5%)	110 (100.0%)

To gain more insight into their feelings about healthcare providers, respondents were asked whether they have had any negative experiences with providers in the past (Table 60). Approximately one-third said they had had a past negative experience.

Table 60: Participants Past Negative Healthcare Experiences

	n	Percentage
No	78	69.6%
Yes	34	30.4%

Table 61 below provides the racial breakdown of how mothers responded to whether they had any negative experiences with healthcare providers in the past. The results indicate that there were significant differences between race and how mothers responded (Pearson Chi Square = 11.002, p = .027).

Table 61: Participants Past Negative Healthcare Experiences by Race

Race	n (No)	n (Yes)	Total
Black or African American	54 (80.6%)	13 (19.4%)	67
Asian and Pacific Islander	2 (66.7%)	1 (33.3%)	3
White	17 (50.0%)	17 (50.0%)	34
Multiracial – White and African American	5 (62.5%)	3 (37.5%)	8
Total	**78**	**34**	**112**

Mothers who answered "Yes" about having a past negative experience were asked about the impact of that experience (Table 62). Respondents were given a list of potential impacts from which they could select all that apply and could choose "other" to provide details. One-third chose "Other," with one mother noting that "It's hard to trust healthcare providers because sometimes they have voiced their personal views out loud. They didn't realize I was there" and another mother indicating that "A nurse yelled at the babies in the NICU for crying. She yelled 'Well it's time for the Methadone." One quarter of respondents reported that their negative experience inspired them to change doctors, one-fifth said they now trust doctors less (20.5%), and almost one-fifth said they have trauma from the event (17.8%).

Table 62: Impact of Past Negative Healthcare Experiences

	n	Percentage
Other	25	34.2%
I switched doctors	19	26.0%
I trust doctors less now	15	20.5%
I have trauma from that event	13	17.8%
I don't go to the doctor as much anymore	8	11.0%
I feel uncomfortable with doctors and other medical staff	7	9.6%
I avoid going to doctors	7	9.6%
I don't trust doctors anymore	5	6.8%
My child has trauma from that event	3	4.1%
I don't trust doctors with my children	3	4.1%
I avoid taking my children to see doctors	2	2.7%
Total	107	

Participant Interview Data

During interviews, the research team asked additional questions about mothers' previous experiences with healthcare providers. Table 63 shows the number of study participants that answered each question and how the questions were answered. Of the 19 study participants who answered whether there had been a time when a doctor confused them, a majority of them (68.4%) answered 'No.' Additionally, 70.6% of the 17 respondents who answered the question regarding whether there had been a time when they asked for an explanation of something they didn't understand answered that they had. 64.7% never experienced a time in which a doctor made them feel uncomfortable; however, one-third had (35.3%), with one mother mentioning not feeling comfortable getting the

COVID-19 vaccine until after her baby was born to her OBGYN. Her OBGYN proceeded to tell her, “not to call when she was on her death bed and her baby had Covid because it would be her fault for not getting the vaccine.” While the table also shows that most respondents (66.7%) had never experienced a situation in which a doctor made a decision for them that they did not agree with, there was a more even split between the 16 respondents who answered whether they had ever felt not heard by a doctor. Just over half of respondents (56.3%) had never felt not heard by a doctor; however, 43.8% had felt not heard by a doctor. During an interview one mother said, "After my daughter’s birth, the surgeon asked about a tubal ligation and decided no for me. He shrugged me off and said I was too tired from the birth.” Given that about a third of mothers have had times they have had negative experiences like feeling uncomfortable or not listened to, interviewees were asked whether they felt that they could speak up to their doctors in situations in which they felt like they were not being heard. Over three quarters of interviewees (77.8%) felt that they could speak up to their doctors in these situations. However, 22.2% of mothers felt that they couldn’t speak up to doctors, with one mother stating that she didn’t feel comfortable asking her doctor things because her doctor blew her off.

Table 63: Questions about Previous Experiences with Healthcare Providers

Question	n	Percentage “Yes”	Percentage “No”
Has there ever been a time when a doctor confused you?	19	31.6%	68.4%
Has there ever been a time when you asked for an explanation of something you didn’t understand?	17	70.6%	29.4%
Has there ever been a time when a doctor made you feel uncomfortable?	17	35.3%	64.7%
Have you ever felt not heard by a doctor?	16	43.7%	56.3%
Do you feel like you can speak up to your doctors in these situations?	18	77.8%	22.2%

During and after delivery, when mothers are at their most vulnerable, the mothers surveyed and interviewed indicate fairly positive experiences with their doctors and hospital staff during delivery (Table 64). A majority of the 21 participants who provided information on their delivery experience were satisfied with their delivery, making up 57.1% of respondents. However, 6 of the respondents, or 28.5% of them were either unsatisfied or very dissatisfied with their deliveries, with one mother noting that after her baby was born with the umbilical cord wrapped around their neck, and had their arm broken during delivery, the doctors mentioned that if they would have done an ultrasound like she had asked for when she came in, they would have known to do a caesarean section.

Table 64: Delivery Experience Satisfaction

Delivery Experience Satisfaction	n	Percentage
Satisfied	12	57.1%
Mostly Satisfied	3	14.3%
Unsatisfied	2	9.5%
Very Unsatisfied	4	19.0%
Total	21	100.0%

Tables 65A through 65C provide further details, which were coded from open-ended interview questions asking study participants to describe their delivery experiences. Respondents provided information on how they felt about both their hospital experiences as well as experiences with medical staff within the hospitals. They also provided information on the labor process itself, as well as if they needed induced. Table 65A provides general answers given by study participants, Table 65B provides positive responses regarding delivery experiences given by study participants, and Table 65C provides negative responses regarding delivery experiences given by study participants.

Table 65A: Information Regarding Delivery Experience (General Information)

Delivery Experience (General)	**n**	**Percentage**
C-Section was needed	7	35.0%
Needed induced	4	20.0%
Other	3	15.0%
Long/Drawn out labor	1	5.0%
Total	15	

Table 65B: Information Regarding Delivery Experience (Positive Experiences)

Delivery Experience (Positive)	**n**	**Percentage**
Positive Staff/Doctor Experience	7	35.0%
Smooth Delivery	4	20.0%
Total	11	

Table 65C: Information Regarding Delivery Experience (Negative Experiences)

Delivery Experience (Negative)	**n**	**Percentage**
Negative hospital experience	5	25.0%
Unexpected medical issues regarding self	5	25.0%
Negative staff/doctor experience	2	10..0%
Health concerns regarding baby	1	5.0%
Total	13	

Interviewees were also asked how well they were treated at the hospital during and after their delivery. Table 66 displays how study participants responded. Overwhelming, participants answered that they were treated well, with

76.2% of the 21 respondents indicating that they had been treated well. Only 3 respondents explicitly mentioned having not been treated well, and only 2 respondents mentioned that they were neither treated well, nor unwell, during their delivery experiences. A mother who had a very positive experience with a previous birth at another hospital said her experience with the most recent birth was "horrible. Before I was more comfortable with a midwife. But at [local] hospital things were a lot slower, there were delays and they were short staffed. After giving me an ultrasound, they induced me. I stayed much longer (after the birth) because of my blood pressure. The doctor said it was normal." She also noted "the nursing staff and doctors treated me well." Another example of a horrible experience was, "[Dr. wanted to induce. She did not want that.] "I had him on the 3rd of the month but was admitted on the 1st of the month. My OB was worried about me having pre-eclampsia. I felt like I was able to advocate for myself when it came to being induced. When I got my epidural – they couldn't find the correct spot and they had to poke me a couple of times. Thirty minutes after the first epidural – only half of my body was numb. The doctor ended up having to come back and try to fix the epidural. By the time I gave birth, the epidural was only partially working."

Table 66: Participants Treated Well at Hospital

Treated Well at Hospital	n	Percentage
Yes	16	76.2%
No	3	14.3%
Neither	2	9.5%
Total	21	100.0%

Discussion

Overall, a majority of mothers have positive opinions of their healthcare providers and have had positive experiences in the healthcare system, though they have slightly more positive opinions of their OBGYN than their primary care doctors or child's pediatrician. That said, a smaller but significant number of mothers have neutral or negative opinions of doctors. More significantly, one third of mothers indicated having had traumatic experiences

that have altered their trust toward doctors and/or caused them to switch doctors, with significant racial disparities being seen in how mothers responded to this question. In relation to past negative healthcare experiences, one survey respondent wrote that, "I lost a child in 2018, and if I was heard properly by doctors, it may have saved my baby. I had a blood clotting disorder that went unnoticed, and I continuously was sent home by providers and told it was nothing even though I was bleeding out." Additionally, statistically significant racial differences were seen in how mothers felt judged by their doctors, specifically when it came to mothers feeling that they were being judged negatively based on their race by their primary care physicians and their OBGYNS. One survey participant noted that "As a Black woman, I don't trust them, and it just comes from the history of Black people and doctors. Many Black women have died because doctors weren't listening to their pain and just brushed them off like they could handle it." One third of interviewees had previous negative experiences with doctors including feeling uncomfortable, confused, and not listened to, as well as having decisions made for them that they did not agree with. One mother reported during an interview that, "my OB lied to me about using forceps and connecting wires on to the baby's head." She also stated that she hated the hospital where her baby was delivered with a passion.

Enrollment & Birth Outcomes

The data provided includes 1317 pregnancies (or pregnancy pathways opened) that have corresponding birth outcome data between July 2017 and September 2020. Of these, 34 are twin births and 1 is triplets for a total of 1352 children.[1] Additionally, the dataset includes a second (127), third (4), or fourth (1) pregnancy for some moms, so there are repeated observations of some clients when they enrolled in a new pregnancy pathway (total 123 moms, 270 pregnancy pathways). Almost half of the pregnancies were in mothers living in census tracts with very high risk for infant mortality (Table 67).

Table 67: Census Tract Risk

Risk Level	n	Percentage
Low	127	5.8%
Mid	755	34.3%
High	255	11.6%
Very High	2,203	48.4%
Total	2,203	100.0%

A majority of the births were black or African American (51%), followed by white (36.7%) as seen in Table 68, and 11.9% were of Hispanic, Latino, of Spanish descent.

Table 68: Baby's Race

Race	n	Percentage
Black or African American	672	51.0%
White	483	36.7%
Multiracial – Black or African American and White	52	3.9%
Multiracial – Black or African American and Hispanic	31	2.4%
Hispanic	20	1.5%
Other	59	4.5%
Total	1,317	100.0%

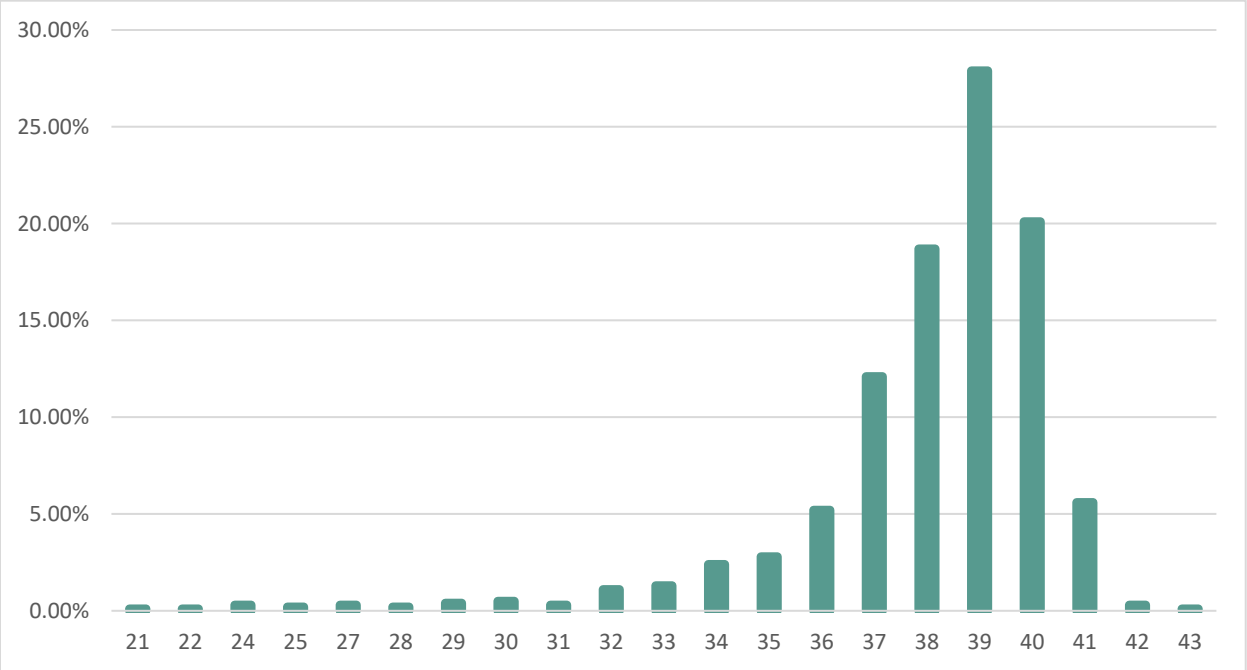
The data provided includes measures for when mothers enrolled in the program and their birth outcomes. Slightly less than half of pregnancies (47.4%) were enrolled during the second trimester, with the remaining enrollment split almost evenly between the first (29.6%) and third trimester (23.0%) (Table 69).

Table 69: Trimester Enrolled in HUB

Trimester	n	Percentage
1st	390	29.6%
2nd	624	47.4%
3rd	303	23.0%
Total	1,317	100.0%

Chart 2 shows the gestational age at birth, with a mean of 38.1 (SD 2.46, range of 36.7).

Chart 2: Gestational Age at Birth (Weeks)



Two key factors associated with infant mortality are preterm birth and lower birth weight (Ohio Department of Health, 2018) (Table 70). Of these pregnancies, 202 (15.3%) resulted in babies that were low birth weight, 193 (14.7%) were preterm, and 218 (17.6%) resulted in the need for special care, like a stay in a neonatal intensive care unit (NICU).

Table 70: Birth Outcomes

	n	Percentage
Low birth weight	202	15.3%
Preterm	193	14.7%
Special care	218	17.6%

Examining how these birth outcomes vary by race shows that there is a weak, but statistically significant relationship between a client's race and the likelihood of both preterm (Pearson Chi Square=12.259, p=.016) (Table 71) and low weight birth (Pearson Chi Square=11.439, p=.022) (Table 72). Each show that Black or African American clients have about 5% more preterm and low birth weight pregnancies than white clients.[2]

Table 71: Preterm Birth by Race

	Full Term	Preterm	Total
Black or African American	555	121	676
% within race	82.1%	17.9%	100.0%
% within term	51.1%	63.4%	52.9%
% of total	43.4%	9.5%	52.9%
White	410	60	470
% within race	87.2%	12.8%	100.0%
% within term	37.7%	31.4%	36.8%
% of total	32.1%	4.7%	36.8%

[2] We also created logistic regression models for each birth outcome to determine the independent effects of demographic and risk level variables. These models did not indicate statistically or substantively significant results for any variables.

Black or African American & White	52	4	56
% within race	92.9%	7.1%	100.0%
% within term	4.8%	2.1%	4.4%
% of total	4.1%	0.3%	4.4%
Hispanic, Latino/a, or Spanish Origin	4	0	4
% within race	100.0%	0.0%	100.0%
% within term	0.4%	0.0%	0.3%
% of total	0.3%	0.0%	0.3%
Other	66	6	72
% within race	91.7%	8.3%	100.0%
% within term	6.1%	3.1%	5.6%
% of total	5.2%	0.5%	5.6%
Total Count	1,087	191	1,278
Total % within Race	85.1%	14.9%	100.0%
Total % within Term	100.0%	100.0%	100.0%
% of Total	85.1%	14.9%	100.0%

Table 72: Low Birth Weight by Race

	Full Term	**Preterm**	**Total**
Black or African American	551	125	676
% within race	81.5%	18.5%	100.0%

% within term	51.0%	63.1%	52.9%
% of total	43.1%	9.8%	52.9%
White	409	61	470
% within race	87.0%	13.0%	100.0%
% within term	37.9%	30.8%	36.8%
% of total	32.0%	4.8%	36.8%
Black or African American & White	50	6	56
% within race	89.3%	10.7%	100.0%
% within term	4.6%	3.0%	4.4%
% of total	3.9%	0.5%	4.4%
Hispanic, Latino/a, or Spanish Origin	4	0	4
% within race	100.0%	0.0%	100.0%
% within term	0.4%	0.0%	0.3%
% of total	0.3%	0.0%	0.3%
Other	66	6	72
% within race	91.7%	8.3%	100.0%
% within term	6.1%	3.0%	5.6%
% of total	5.2%	0.5%	5.6%
Total Count	1,080	198	1,278
Total % within Race	84.5%	15.5%	100.0%
Total % within Term	100.0%	100.0%	100.0%
% of Total	84.5%	15.5%	100.0%

Infant Mortality Data for the NW Ohio Pathways HUB

In addition to the birth outcomes noted above, data on incomplete pregnancy pathways was analyzed. Table 73 below indicates that there were 34 incomplete pregnancy pathways, with over half (55.9%) of those pregnancies having ended in a miscarriage before 20 weeks. Other pregnancies were marked as still birth or fetal death, which

indicates that a pregnancy ended at 20 weeks or more, and these incomplete pathways made up 29.4% of the cases. Lastly, 14.7% of pregnancy pathways were incomplete due to termination of the pregnancy.

Table 73: Reasons for Incomplete Pregnancy Pathways

	n	Percentage of Incomplete	Percentage of Overall Pregnancy Pathways (1,317)
Miscarriage (pregnancy and spontaneously before 20 weeks)	19	55.9%	1.4%
Stillbirth or fetal death (pregnancy ended at 20 weeks or more)	10	29.4%	0.8%
Termination of Pregnancy	5	14.7%	0.4%
Total	34	100.0%	2.6%

Table 74 provides further details on the nine cases of infant mortality based on data from the health department for years 2018-2019 (2020 is not yet available). A majority of the cases' (44.4%) causes of death were unknown.

Table 74:

	n	Percentage
Unknown	4	44.4%
Prematurity, low birth weight, lungs	1	11.1%
Cord prolapse, multiple fetal anomalies	1	11.1%
Emergency C-section	1	11.1%
Not listed	1	11.1%
SIDS	1	11.1%
Total	9	100.0%

Discussion

Previous research on low birth weight and preterm birth shows persistent racial disparities, with black mothers significantly more likely than white mothers to have preterm and low birth weight pregnancies (Ohio Department of Health, 2018). While the racial gaps in HUB client birth outcomes above are smaller than we would expect from the general population, part of this is driven by higher rates of preterm and low birth weights among whites in the sample above rather than lower than expected rates among black or African American mothers. Further, the above analysis is bivariate and does not control for other variables, so any conclusions are suggestive, and should be subject to further, more robust analysis, and compared against rates in the general population in the same region before concluding there are any effects related to participation in the Pathways HUB. Another explanation for these differences might be that the HUB's impacts on Black births are slightly more positive than those for White births.

Table 75: Low Birth Weight and Pre-Term Birth Rates for Northwest Ohio Pathways HUB Clients Compared to Lucas County Residents

Race	Low Birth Weight Rate for Pathways HUB Participants for 120+ Days	Low Birth Weight Rate in Lucas County	Pre-Term Birth Rates for Pathways HUB Participants for 120+ Days	Pre-Term Birth Rate for Lucas County
Black or African American	11.0%	14.2%	10.4%	14.6%
White	10.8%	8.0%	11.0%	9.9%
Other	5.5%	9.5%	7.3%	8.9%

Pathways HUB Organizational Analysis

Perspectives on the organizational and programmatic functionality of the Pathways HUB were derived from Interviews with CHWs, a survey with agency partners, and a focus group with HCNO staff along with ongoing dialogue with HNCO and ProMedica research partners and insights from monthly CHW meetings. Though each form of stakeholder engagement was different and included a unique set of questions due to the differing roles of

the stakeholder group in the HUB and Pathways implementation, several core research questions framed each of these discussions and inquiries.

1. What aspects of the Pathways HUB model work best? (Strengths)
2. What aspects of the Pathways HUB model do not work well? (Weaknesses)
3. Where are things evolving and changing, for better or worse? (Opportunities and Threats)
4. What barriers or challenges contribute most to client drop-out and incomplete pathways?

SWOT

To begin analyzing the rich data collected from these engagements the results were first organized into a SWOT analysis to pull out the strengths and weaknesses of the program as identified by participating stakeholders and also to identify opportunities for programmatic improvement and threats to future sustainability and programmatic success. Using Nvivo software the most frequent responses to each type of question were identified. Those results are listed below in Table 76. Further discussion on the most significant of these findings is included in the next section.

Table 76: SWOT Analysis of Pathways Program

Strengths
• Does well at obtaining, maintaining, and distributing funding • Developed a broad and comprehensive network of partners to provide and distribute resources • Ability to procure additional resources for clients • Manages CCS well • Excellent maternal care program • Creativity of staff to directly address social determinants of health • Advocacy of the Pathways HUB Model • Understanding of social and healthcare systems • Ability to work with managed care to get contracts • Quality assurance • Monthly CHW meetings
Weaknesses

- Information access for program participants
- Lack of universal understanding of the program among clients
- Uneven participant benefits – depending on CHW and agency employing them
- Employment and Training Pathways are difficult to complete
- Confusion around use of CCS and which checklists are reimbursed
- Referral system misses women without a primary care physician or OBGYN

Opportunities

- New supportive legislation
- Local initiative around childcare and transportation
- Ongoing evaluation
- Improved software (CCS system)
- Improved cross-system coordination (agency to agency data sharing)
- Improved CHW Career Pipeline

Threats

- Funding (reliance on grant funding)
- Distrust between partner agencies
- Different organizational/professional approaches between Public Health and Social Work agencies and practitioners
- Increased demand and need for services
- COVID-19
- Client ability to access needed information
- Clients dire level of need, survival thinking, and past trauma (unwilling or unable to accept help or accurately identify needs)
- Not enough CHWs and CHW turnover

1 CHW Interviews *2 Agency Survey* *3 HCNO Focus Groups* *4 CHW Monthly Meetings*

In assessing the data around these core research questions several key programmatic and organizational aspects of the Pathways HUB model emerged as having the greatest impact on HUB functionality. These aspects are the networked system design, the CCS data system, the CHW model, the client-driven approach, and the referral process. Stakeholder feedback around each is provided in the following sections.

Core Aspects of the HUB Model

Networked System Design and Coordination

The networked design of the Pathways program is essential to its function as a coordinated care system. However, like all networked systems, there are both benefits and costs of the model. Finding the balance between uniformity and autonomy is the inherent struggle of network design, and Pathways continues to work toward that balance. Both CHW interviews and the agency survey responses expressed a desire to see improved cross-system coordination. Suggestions for improved coordination include increased agency to agency data sharing, increased access to information about programs and resources available to clients, and the ability for supervisors to access information about clients and CHWs served by other agencies.

The agency survey responses indicated a need for more frequent meetings with partner agency supervisors to better understand service availability and approaches to the work. One agency representative expressed a desire to "see which organizations are better at closing different pathways and how they are doing it, discussing the differences will let us see how they can all be strengthened." Though the CHWs and CHW supervisors from all the agencies are invited to attend the monthly CHW meetings, this platform focuses on sharing HUB information, training materials, and other supports aimed directly at CHWs rather than the agencies in which they work. Higher-level agency to agency connection is lacking. Both CHWs and agency representatives expressed concern that agencies approach the work differently, creating inconsistencies around outcomes for clients and making cross-agency collaboration difficult. These differences were attributed to some additional concerns by both groups including reduced client understanding of the Pathways program and confusion about CHWs. All groups studied, including clients and HCNO personnel, expressed that clients often do not understand that they are enrolled in the Pathways program and that their CHW works to deliver this program through one of the partner agencies. The lack of recognition of the Pathways HUB program is a concern for clients_' _ability to stay connected to the program in meaningful and intentional ways. Further, there does seem to be some confusion on the part of clients as to the role of the CHW based on the types of organizations that they work for: according to one survey response, "some think that CHWs are nurses and others think they are case workers." This skewed conceptions of the CHW in some accounts have led to unrealistic or improper expectations of the CHWs' abilities and authority.

Communication and Responsiveness

When asked specifically about communication, information sharing, and responsiveness the results were mixed. On the one hand, 4 out of 5 agency representatives agreed that communication (information and feedback) between Hub administrators and agency personnel is effective. However, 2 out of 5 agencies surveyed said that they did not think that they had adequate information to serve their clients well. The commentary around communication and information concerns seemed to be largely pandemic related and caused, at least partially, by quickly changing information, safety protocols, and remote working on behalf of the Hub management at HCNO. However, 2 out of 5 agencies surveyed also said that they did not think that HUB administrators are responsive to their concerns. The commentary around this question suggested that the system is very bureaucratic and slow to address needed changes. An example cited was the transition to Pathways 2.0. The respondent noted that it "has been operational for a year and it has not been implemented or even introduced."

Care Coordination Systems (CCS)

The CCS software system is another essential piece of the Pathways program design as a coordinated care system. This software allows all participating agencies and their CHWs to complete client needs assessments, and to track services rendered, and resources distributed. In turn, the system is also used to track billable activity for insurance providers, grant funders, and other oversight needs. As such, this system is extremely important to the work that is being done across the HUB and partner agencies. However, nobody seems to be particularly happy with it. The CHWs interviewed and the agency representatives surveyed found the system to be difficult to navigate and learn as well as very time consuming. Agency representatives said that they often are "not sure what Pathways, Checklists, and Tools are reimbursed" and therefore are not clear on what they should be inputting into the system. One respondent said "(you) have to consider families identifications of needs, then translate to what the HUB wants - who is auditing--and Medicaid who is auditing them…feels like a lot of trial and error to get it right." This group also commented that they "feel some of the questions are not helpful or appropriate and that they wish "some of the questions could auto populate on the checklists." One CHW commented that "whoever is changing our system does not do the work" as they are making it "more convenient for pulling data but harder for us to input, more confusing and time consuming. Some CHWs worried that the clients would get overwhelmed,

exhausted, or disinterested in the questions. One CHW suggested that a "group of CHWs be consulted to give feedback on the intake process."

The agency representatives and the CHWs were not the only ones with complaints about CCS. The HCNO staff focus group also provided information on frustrations with CCS from the administrative side. The staff found it difficult to harvest data from the system to capture needed statistics in a way that could be used for research or evaluation. The difficulty of the system was indicated by the fact that only one of the 5 staff present was able to pull data and reports from the system with confidence. Despite these difficulties with the CCS system, currently there is not a viable alternative available on the market. Given this reality the only option for addressing these issues may be to consult a trainer to provide some assistance to the various user groups and for the groups to try to communicate better their distinct system needs and frustrations to find a workable solution within the constraints of the system.

CHW Model

As discussed previously, the CHW is the heart of the Pathways HUB program, providing clients with essential resources, information, and support. This research has shown that the CHW role goes far beyond the technical aspects of care coordination and, for many clients, provides an essential support system that mirrors that of a friend, sister, aunt, or mother. The evidence provided by our client interviews indicates that the technical and emotional support of the CHW may be the leading cause of the reduced feelings of stress and isolation, and increased feelings of safety and hope felt by the mothers participating in the Pathways program. The CHWs that we interviewed expressed a deep commitment to the work, using terms such as calling, purpose, and "God's work" to describe their profession. They were clear that not all their colleagues felt this way but believed that the majority were very committed. Despite these feelings, most of them also expressed concern around burnout and 70% of those interviewed said that they were either considering a career shift now or anticipating that they would need to within the next few years. The CHWs, agency representatives, HCNO staff, and even some clients interviewed expressed concerns over CHW turnover, and throughout the course of our study several of our respondents lost their CHW to turnover.

Burnout & Turnover

The causes of CHW burnout and turnover, according to the CHWs interviewed and the agency survey responses, are caseloads, compensation, benefits, and working conditions (Harrell et al., 2020). The concerns about working conditions were related to the home visiting aspect of the work. CHWs were concerned about the miles that they were putting on their personal vehicles to conduct the visits and in some cases about their personal safety when conducting the visits. The clients of the program are low income and, in many cases, live in subsidized or Section 8 housing. Some CHWs expressed concerns about the safety of some of these neighborhoods and complexes due to high crime rates. One CHW also voiced a safety concern about being in the homes with clients' domestic partners: she said, "sometimes the partners don't like them being in the program and they don't like us coming around and asking all of these questions." CHWs, HCNO staff, and the mothers we interviewed all indicated that domestic violence, abuse, and trauma were not uncommon in the lives of Pathways clients, and the nature of CHWs work, at times, puts them uncomfortably near these events.

The nature of the work is difficult due to the complexity of the social service systems that CHWs are assisting clients to navigate as well as the ever-changing pool of community resources available. Agency representatives and CHWs interviewed indicated that it is a "steep learning curve" and that it often takes years for a CHW to really have a full grasp on all the systems. Many CHWs interviewed indicated that CHWs are very reliant on each other to share information and assist with systems navigation. Agency representatives wrote in their survey responses that failure to see how difficult CHW work is on behalf of HUB staff was a source of contention. The respondent said ...

> *"Staff does not account for the steep learning curve for CHWs. HUB staff are familiar with the system far better than a CHW, but they assume CHWs are as familiar and able to navigate a case through the system. There's lots to learn – resources and contacts constantly changing – it is hard to keep up."*

One CHW commented that it is "sink or swim – they just threw us in the field to follow other CHWs to see how they conduct visits." The training of CHWs and comfort level with training was quite variable. Some had quite different feelings than the CHW above, expressing a high level of confidence in understanding and navigating the system.

Like many things with the HUB, their experience was very dependent on the agency that the CHW was working with.

Because the CHWs are employees of the agencies, and the agencies are autonomous organizations that function quite differently, the experience of the CHWs was also quite different. Four of the CHWs interviewed worked for more than one agency under pathways and expressed differences in training, resources, support, culture, caseloads, and compensation as reasons for preferring one agency over the other. One agency representative noted that the "newness" of the CHW profession was part of the issue with variability. The comment suggested that more standardization and professionalization of the field was needed.

Caseloads

Caseload was an important variable for all the CHWs interviewed. The average caseload for the CHW's interviewed was around 40 with a range from _2_0_-50. When asked about the optimal caseload the response across the CHWs was about 30. One CHW commented that when she experiences a lighter case load, she feels "more of a connection with clients, can address needs in timely manner, know what is up with them, don't feel mentally overworked (can be mentally draining)." Another commented that without adequate time to connect with each client that it is hard to "build good client relationships and establish trust" and it can be hard to "get them to answer intrusive questions." Another important consideration pertaining to case load is that most of the agencies will not pay overtime, so CHWs must "prioritize clients by needs." Some commented confidentially that they just continue working past their hours and simply forgo the pay calling this "karma time" or working on "god's time."

Compensation & Benefits

Compensation was a concern for all the CHWs that were interviewed. Some indicated that the pay was low enough that they were receiving the same benefits as their clients. One CHW said "although we are employed and mobile, we relate because lots of us are on Medicaid, SNAP, and rental assistance too." The agency survey responses included similar concerns that "financial stability is a struggle for anyone working in a CHW capacity". Differences in pay and benefits were one of the motivations for CHWs to move from one agency to another. The pay is variable because it is determined by the employing agencies, but few are content with the pay range available, and the

turnover rate supports this conclusion. Benefits are a substantial concern for CHWs. Of the CHWs interviewed only two agencies provided health insurance and retirement benefits for their CHWs. Some CHWs had medical benefits through a spouse but others relied on Medicaid or went without insurance. One commented on the irony of their situation, saying "how do we tell our clients to go to doctor when we can't go to the doctor ourselves?."

Client Driven Approach

A distinct feature of the Pathways program is the client driven approach. This approach means that the CHW focuses resources and support services based on the needs identified by the client. The CHW assists the client in identifying needs by going through the checklist with them each month. The checklist covers a broad array of client needs and conditions to link clients to available services. The checklists ensure a level of consistency in the care coordination approach while allowing the client to determine what it is that they see as their current needs. This approach gives clients agency in determining the services and support they will receive, while also avoiding overwhelming them with options. Generally, all groups engaged in this study are supportive of the client driven approach.

However, there are some concerns about the approach that are worth noting. As discussed earlier, due to the various agency affiliations of the CHWs, the clients often have a difficult time identifying the Pathways HUB as the program they are participating in, and subsequently have some difficulty articulating exactly what it is. Though our survey data discussed previously showed that most mothers were aware of most of the services available to them, some were aware of most of the services available to them, some were not. Frequently, during the monthly interviews with clients, the research team would uncover client needs that they were unaware their CHW/the HUB could help with. This lack of consistent programmatic understanding and knowledge may impact the effectiveness of the client driven approach. As one CHW articulated "some clients just don't know what they need; and they don't know what is available to them through Pathways." Feedback from CHWs and agency representatives indicated that the provision of welcome packets to all clients in 2020–2021 as a response to COVID-19 seemed to help create better client understanding of the program. The focus group with HCNO staff suggested that this may become a permanent feature of the program. Based on the feedback from CHWs and agency representatives this

would be a welcome addition. In response to the question asking what would most improve the Pathways program one agency representative said …

> *"better information distribution, marketing and communications are needed. If we were able to break down the Pathways information to be clearer and more conclusive to the people that we are serving, I think that would help a lot."*

Another aspect of the program that complicates the client driven approach is the circumstances of the clients themselves. Feedback from CHWs suggest that for many of the clients asking for and accepting help is difficult and emotionally complicated. The CHWs described this phenomenon in a myriad of ways. Some clients were described as having pride or shame and perceiving themselves as not truly needy or worthy of assistance saying things like "I don't need it because someone else needs it more." Some clients were described as reluctant to accept assistance out of fear of repercussion …

> *"feels like they get confused on who CHWs are and what they do. Moms get worried that what they will tell their CHW they are struggling that will get reported and they will lose their kids."*

Many clients were described as simply overwhelmed with the number of problems that they need to address. One agency representative described the experience of her CHWs trying to navigate this with her clients.

> *"she has a difficult time getting residents in need of services to fill out the applications…, because they have another concrete need and needs this thing fixed immediately without the paperwork."*

Some CHWs and mothers interviewed called this "survival mode" or "trauma thinking," meaning there is a need to focus on immediate threats and other things get postponed or put out of mind. One mother described it as a means of keeping calm, "if I think about everything, I will go crazy with worry. I just need to focus on one thing at a time." The result of this phenomenon, regardless of cause, is that clients sometimes choose not to ask for things

that they need, or do not identify a need util it is a crisis. This was a source of frustration for CHWs because it left them scrambling to find resources quickly or in some cases made it impossible to find the resources in time.

Referral Process

A final piece of the program model that warrants some discussion is the client referral process. The primary means of recruitment for program participants is through referral. According to HCNO staff, most clients are screened and referred to the Pathways program through their primary care physician / "medical home" or their OBGYN. This is an excellent way to ensure that pregnant women and mothers with needs are connected to needed support services. The problem with this approach, according to the staff, is that women without a "medical home" are not referred, and mothers who do not see an OBGYN early in their pregnancy are referred later in their pregnancy than would be ideal. One HNCO staffer said that new moms are often not getting enrolled until the second or third trimester.

> *"We are just kind of missing a small group of people in the area that don't go to the doctor or very rarely go to the doctor or when they do go, they don't follow up. So, there is a small group we have a hard time getting to"*

CHWs also canvas the community, and clients promote the program to family, friends, and neighbors who self-refer by reaching out directly. However, this activity accounts for a small proportion of the clients served and the estimation is that about 80% of clients come from referrals, while 15% are self-referrals, and 5% come from canvassing. According to HCNO staff, this is largely a product of demand and capacity.

> *"There is such a demand from provider's offices with the number of referrals we get and the number of CHWs we have..., I know one of the goals is trying to get clients out on the street, but I don't know if we have the capacity to get to that point."*

Barriers to Success and Threats to Pathways Completion

The Pathways program has enjoyed considerable success in address the causes of infant mortality and in providing support and resources to women and children in need. However, as this research has explored there is still

opportunity for growth and improvement. Across the data instruments, stakeholders were asked to assess barriers and threats to Pathways success from an operational and organizational perspective. This question was framed in three ways; barriers to achieving HUB goals, barriers to success for Pathways participants, and threats to Pathways completion.

Barriers to Success in Achieving HUB Goals

When asked to identify barriers or threats to successful achievement of the Pathways HUB's goals, stakeholders identified accountability, trust, and resources as the greatest concerns. Concerns about trust emerged in the agency survey responses and were focused not on the HUB itself or HCNO's management of the HUB, but on agency-to-agency relationships. Agency representatives claimed that some agencies were not serving clients well and/or managing their CHWs appropriately and that there needed to be better accountability to address this problem.

> *"The lack of trust with the partnership agencies due to lack of accountability. I believe the HUB needs to set standards that agencies should adhere to and if not, the partnership needs to be ended. I believe there are too many agencies with lax supervision."*

The focus group with HCNO staff addressed this concern as well, explaining that the HUB historically took a very hands-on approach to management and did a lot of administrative work on behalf of the agencies; however due to program growth, some of these responsibilities have been delegated down to agencies to manage themselves. The HUB now focuses on goal achievement and performance metrics for accountability rather than a process-based approach.

> *"We do make an effort to standardize as much as we can across the hub to promote transparency and clarity. In terms of goals and metrics, we standardize as much as we can. But in terms of implementation and progress, that is up to the agencies. It is kind of hard to standardize every process of an agency. We have some agencies with 1 CHW and others with 4 or 5. So support looks different*

> *to different agencies. We as a HUB have tried to give a standardized case load and different metrics to hit as best as they can. We create goals because we want to keep growing. Every CHW has their own way of doing things. It is hard to standardize."*

According to the agency survey and HCNO focus group feedback, some agencies have resisted taking on these responsibilities, which is causing some friction across agencies. One agency representative perceived this change as an unfunded mandate, commenting that the problem for them was a lack of funding to complete this additional work...

> *"I believe the first thing needs to change is to assure income for supervision to get great overall performances from agencies. Due to the HUB no longer completing tasks that should have been agency driven from the beginning the agency should receive supervision funding to assure performance is maximized."*

The HNCO staff said that they have addressed this with a stipend system based on performance. Stipends go to the agencies to distribute however they want. From the HUBS perspective, Pathways is designed to be a self-sustaining program. "Supervisors must understand that if they don't provide the outcomes, then they won't get paid."

As with funding concerns, resource concerns are also seen as a barrier to Pathways' success. Toledo has abundant resources to address some needs, but very few resources to address others. Transportation is an example of a resource problem that has been cited by all the stakeholder groups. The public transportation system is limited and difficult to navigate, this is well known but there is not a solution within the grasp of Pathways agencies to be able to address this issue. Similarly, the limited availability of affordable housing has long been a concern in the community. New policies at the city level promise to address this problem, but in the interim, it continues to be a barrier to Pathways program success without a tangible solution.

Barriers to Success for Pathways Participants

The barriers to Pathways completion identified by stakeholder groups are client overwhelm, issues with communications, housing instability, family issues, and transportation. Table 77 below shows the results of the survey of agency representatives. Cumulatively they ranked overburden, housing insecurity/address change, and telecommunications as the top three reasons that clients fail to complete pathways or maintain a strong working relationship with their CHW. These were followed by family issues, employment, and transportation.

Table 77: Ranking of Barriers to Pathways Completion (Agency Survey)

	Meaning	A	B	C	D	E		Cum. Ranking
1	Transportation	9	5	3	6	9	6.4	7
2	Communication (telephone issues)	3	1	4	7	10	5	3
3	Technology/Internet	4	7	5	5	8	5.8	6
4	Housing insecurity/mailing address change	8	2	7	4	4	5	2
5	Overburdened	5	3	1	1	6	3.2	1
6	Don't see the value in the Pathway (unsatisfied)	2	10	8	8	11	7.8	9
7	Citizenship status	12	9	9	9	2	8.2	10
8	Family issues (illness, caretaking, childcare)	7	4	2	2	12	5.4	4
9	Employment (schedule conflict)	6	6	6	3	7	5.6	5
10	CHW incompatibility	11	11	10	10	5	9.4	12
11	Language barriers	10	8	11	11	3	8.6	11
12	Other	1	12	12	12	1	7.6	8

As previously discussed, overwhelm, survival thinking, and past trauma have real effects on clients' ability to accurately identify and prioritize needs, and can hinder clients' willingness and ability to accept help. Additionally, some CHWs indicated that for young moms there can be a lack of understanding of systems and a tendency to get frustrated with the slow pace and bureaucratic nature of support systems. The CHWs emphasized the need for a

"strong bond and trust" between CHW and client to help overcome these patterns of thinking. Many of the CHWs having been Pathways clients previously ensure a level of understanding and empathy for the client's circumstances. This helps to overcome this barrier.

> *"You have to be honest with them, walk them through things and break it down. Set the expectations for communication. I tell them they are free to call or text me any time, and I always get back to them. The way you talk to them, follow through, and offer praise helps keep them engaged. Help them find some resources while you work on the bigger things, this helps them see you really can help."*

Communications barriers and loss of contact with the CHW is the second most prevalent barrier. This comes in the form of housing insecurity and the loss of a mailing address, the loss of a phone or phone number, and lack of access to internet. Without consistent and reliable communication, it is hard for CHWs to keep up with clients and clients may not be able to contact their CHW to provide current information. Throughout the course of this study the research team experienced this with several of the respondents. Some were able to acquire new communication pathways and find their way back to the study, but some were lost and never returned. Another barrier to success in completing pathways cited by the CHWs was access to the internet, word processing, and printing capabilities. Without access to these basic office resources completing applications, forms, and petitions becomes difficult and very time consuming. Access to library resources is limited by work schedules, transportation, and in the past couple of years by Covid-19.

Transportation, Employment, and Childcare are also identified as prominent limitations to Pathways completion and client success. One CHW called these the "prongs of the vicious cycle on no escape". Without reliable transportation and childcare, the clients can't work and without work they cannot afford transportation of childcare. If housing instability is also present the chances of changing circumstances become very slim. Housing and transportation are two of the most difficult pathways to address due to lack of resources in the Toledo area.

Conclusion: Implications & Recommendations

A succinct summary of the conclusions detailed throughout this report and recommendations for action or further research are grouped below using the key themes developed in the report.

Risk Factors

- The Pathways HUB is working with a high-risk population, as indicated by the presence of numerous risk factors for clients who enroll, which are consistent across racial groups.
- Stress reduction due to program enrollment is a clear and consistent finding from the data. Almost all clients surveyed and interviewed reported a decrease in stress after enrollment and/or over the course of their enrollment. The interviews with mothers indicate that their relationship with their CHW and the emotional support and support accessing resources are the central driver in this stress reduction. This finding is important given the link between stress and risky birth outcomes (pre-term and low weight birth), particularly for black mothers.
- In addition to stress reduction, a large majority of mothers surveyed reported HUB participation increased or significantly increased their feelings of security, safety, and hope.
- A small, but significant percentage of mothers reported persistent problems with housing and their landlord.

Recommendations

- Given the central role of CHWs in addressing client risk factors, particularly stress, it is essential CHWs be given or can maintain a client caseload that allows them the time to form meaningful relationships with clients.
- Consider adopting additional education and/or pathways to assist clients with issues related to landlords.

Pathway Knowledge, Completion, & (Under)Utilization

- The Pathways HUB model reduces many of the above risks by assisting clients with completing pathways. Nearly three-quarters of the over 58,000 pathways opened during the period studied were completed, and completion rates are consistent across racial groups.
- There are a variety of barriers to pathway completion, both internal and external to the program. For example, large CHW caseloads may not leave them enough time to assist with less pressing pathway completion. Externally, overwhelmed social service systems and a community-wide lack of affordable housing and inadequate supply of housing vouchers make closing these pathways more difficult (AHRQ, 2021).
- A related, but distinct, problem to incomplete pathways is pathway underutilization, which results from a lack of awareness of resources available and a client focus on immediate needs. Additionally, the stress and trauma from client interactions with healthcare providers may lead to medical pathway underutilization and/or completion. Relatedly, when mothers spend time having to find a new doctor after bad experiences with a previous one, doing so takes time away from opening/completing other pathways for both the CHW and client.
- Education pathways drive completion rates given that these are the most frequently opened pathways and completed at the highest rates. Given external barriers, lower completion rates for other pathways are not necessarily a reflection on the quality of the Pathways HUB program/model.

Recommendation

- HUB staff currently have target metrics to prioritize overall programmatic resources. It is recommended to continue doing so and to determine the highest impact pathways for improving pregnancy outcomes and focusing resources there.
- The HUB could also consider adopting new ways to address pathway underutilization through client/CHW education or additional checklist questions to uncover unmet needs.

Medical Services

- Overall, a majority of mothers have positive opinions of their healthcare providers and have had positive experiences in the healthcare system, though they have slightly more positive opinions of their OBGYN than their primary care doctors or child's pediatrician.
- A smaller but significant number of mothers have neutral or negative opinions, and more significantly, have had traumatic experiences that have altered their trust toward doctors and/or caused them to switch doctors.
- One third of interviewees had previous negative experiences with doctors including feeling uncomfortable, confused, and not listened to, as well as had decisions made for them that they did not agree with.

Recommendations

- At an individual level, the HUB could consider developing a medical advocacy educational pathway to help clients respond to poor treatment.
- At a programmatic level, the HUB could consider finding ways to help mothers have advocates attend important medical visits to make sure clients have support.

Birth Outcomes

- HUB clients are a high-risk population for risky birth outcomes and infant mortality, given that many clients live in high, or very high-risk, census tracts.
- The HUB's annual reports indicate that infant mortality rates for mothers enrolled in the HUB are consistently lower than rates for mothers in the same region that are not enrolled.
- The fact that the rate of preterm births and low birth weights are similar to the expected rates for black or African American mothers and slightly higher than expected for white mothers, but the infant mortality rates are lower suggesting potential positive influence of the program.

Recommendations

- Given the strong relationship between stress and risky and negative birth outcomes, particularly for black mothers, and the clear finding above that HUB participation reduces stress, the future research by HUB

staff or in partnership with external academic and/or medical research partners should further investigation this relationship in a more robust way.

Birth Outcomes

- SWOT analysis indicates a variety of strengths, weaknesses, opportunities, and threats for the Pathways HUB.
- The growth of the HUB clientele indicates that the HUB is successful in recruitment, though staff are aware of recruitment improvements in both the number of mothers enrolled and the timing (trimester) of enrollment.
- Stakeholder input revealed challenges in balancing partner agency autonomy with standardization across partners, as well as communication difficulties created in a networked model.
- The CCS software presents several challenges for HUB staff, partners, and CHWs for inputting, understanding, and analyzing client data.
- The CHW model has clear benefits for client stress and risk reduction, but is challenged by burnout, turnover, caseloads, and poor compensation and benefits.

Recommendations

- To the extent recruitment problems result from a capacity issue, the HUB should consider broadening their partnerships with relevant community groups, churches, and schools to promote the program, developing volunteer outreach programs, or applying for grants that could fund expanding outreach capacity.
- The Hub should work to provide a platform to improve cross-system coordination to address communication and standardization challenges.
- The HUB should work with partners to find improvements within CCS to address identified challenges and/or consider alternative systems.

- The HUB should assess CHW performance and longevity across partners to determine how the most successful agencies reduce CHW challenges and try to implement them more widely to the extent feasible.

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Appendix I: CHW Interview Questions

Part A. Preliminary Questions

Intro: I would like to start off by talking a little bit about your experience with the HUB and the Pathways program.

1. How long have you been a CHW with the HUB?
2. Were you a client in the HUB before becoming a CHW?
3. Do you have any previous job experience related to your current position?

Part B. HUB Processes and Management

Intro: I would like to talk a little bit about the HUB and the way that the Pathways program works and is managed by HCNO.

1. What are your likes and dislikes about the Pathways HUB program?
2. Talk to me about the process of outreach and communication between CHW's, caseworkers, and clients. What are the types and frequencies of communications?
3. Do you think the process of sharing information and feedback from HUB administrators to frontline health workers and vice versa is effective?

Part C. Client Interactions, Service, and Retention

1. How many cases do you manage on average?
2. What level of interaction and understanding does this load allow you to have with your clients?
    a. Is this case load optimal?
3. Do you think that the HUB retention system, as currently designed, works very well?
4. Do you feel like you have the training and knowledge to be successful as a CHW?
5. Does NW Ohio have the services your clients need?
6. Are there client needs you feel the HUB is not meeting well?

7. Does your organization/the HUB struggle to recruit mothers to be in the program? Does outreach effectively reach all groups?
8. Do you feel valued by the HUB?

Part D. Clients/Pathways

1. Do you have any thoughts about why clients do not complete their pathways?
2. What would you say are the greatest challenges you face in working with mothers to complete pathways?
3. Are there some pathways that are especially hard for you and mothers to complete?
4. Are there pathways clients need that they tend to avoid?
5. Are there any new pathways you think are needed based on your experience?
6. We know people of color, particularly black mothers, have higher rates of pregnancy issues. Based on your experience, why do you think that is?
    a. Do you have any suggestions to help address these issues based on your experience with the HUB?

Part E. Overall Assessment

1. If you could change one thing about the program Pathways HUB that would help it work better for your clients, what would that be?
2. Is there anything I did not ask you about that you want me to know?

Appendix II: Interview Questions for Pathways HUB Graduates/Past Participants

Reminders

1. *Thank you for your time to interview. This should take only about 45 minutes-1 hour but let me know if you need to leave at any time.*
2. *You will receive a $50 gift card for your time. Maddi will text you after to coordinate this.*
3. *We are taking notes and recording. Will delete the recording after.*
4. *The interviews are confidential, so please be honest. Your CHW, nor the Pathways HUB will know how you answer.*

Intro

1. How did you first hear about the Pathways HUB program?
    a. Can you explain when/how you enrolled?
2. Baby Questions
    a. When was your baby born?
    b. What is your baby's name?
    c. Did you have any health complications or concerns with your pregnancy?
    d. Did you have any complications or concerns about the baby's (name) health or development?
    e. How is your baby's health now?
3. How have things been going for you since you completed the Pathways HUB program?

CHW

4. Tell me about your relationship with your community health worker.
    a. Do you remember their name?
5. Did you feel comfortable asking your CHW for help?
    a. Were you ever uncomfortable asking for anything?

Needs

6. Tell me about how your life was going when you were in the Pathways HUB.
7. What were the main needs you worked on with your community health worker [Insert CHW name]?
8. Which needs were the most helpful?
    a. Why?
9. Did your CHW tell you about additional needs/pathways that Pathways HUB offers?
10. Are there any needs you started working on but did not complete? a. Which ones? b. If so, why?
11. Are there needs you thought about starting to work on but did not? a. Which ones? b. If so, why?
12. Are there any needs that you finished working on that you did not feel were helpful or worthwhile? a. Which ones?

Barriers

13. What were the biggest barriers/challenges to addressing your needs?
    a. If interviewee needs prompting or concrete examples...
    b. Was childcare a challenge while you were in the HUB?
        i. Was transportation...?
        ii. Was housing...?
        iii. Was employment...?
        iv. Was paying the bills...?
        v. Any additional challenges?
14. What did/would help overcome these barriers/challenges? Overall Satisfaction and Thoughts
15. What was the biggest benefit you got from being a part of the Pathways HUB?
16. Do you feel that your quality of life improved because of the help you got to address your needs?
    a. How?
    b. Why or why not?
17. Do you feel that your stress level was impacted by the help you got to address your needs?
    a. How?

18. If you could change one thing about the help you received that would have made your pregnancy/experience, be less stressful, what would it be?
19. Advice for future mothers who go through the program?
20. Is there anything else that I didn't ask about that you would like to tell me?

Lastly

- Demographic questions
    - Age, Race, Ethnicity, baby birth date, any other kids?
- Gift card preference (if don't have already)
    - Email address for electronic card
    - Mailing address for physical card

Appendix III: Interview Questions for Current Pathways Participants

General Demographic Questions:

- What is your race/ethnic identity?
- How old are you?
- Are you currently pregnant?
    - If yes, how far along?
    - If delivered, how old is your baby?
- Do you have any other kids?
- How many children are in your household and/or under your care? - Any addition to your own?
- How many people live in your household (children and adults) and what are your relations to them?
- What is your current Marital/Partnership status?
    - If yes, what is your partner's employment status?
    - Do they live with you and the baby/kids?
- Do you rent your residence, own the residence, or share housing with relatives and friends?

Questions for Moms Who Have Delivered:

- How is baby doing?
- Was he/she born on schedule and at a healthy weight?
- Any complications during current pregnancy?
- How was your delivery?
- Did you like the hospital where you delivered?
- Do you feel like the staff treated you well at the hospital?

Questions for All Moms:

- How is baby doing?
- Any complications or concerns about the baby's health or development?

- Any concerns about the baby's growth or development?
- Have you had any check-ups or appointments for the baby?
- What things concern you most about your baby?
- What things are you currently most concerned about?

Questions for Moms with other children or pregnancies:

- Did you have any complications or were deemed high risk with other kids?
    - If yes, what was going on?
- How many other pregnancies?
- Were any of those pregnancies deemed high risk or did you have any complications?
- Were you under the care of an OBGYN or a family doctor while pregnant?
    - If no, why not?
- Were any of your pregnancies deemed high risk?
    - If so, how many?

Housing Questions:

- How long have you lived at your housing location?
- How do you feel about your current housing situation?
- Do you feel that your housing is affecting (or affected) your pregnancy in any way?
- What are your likes/dislikes?
- What are you currently most worried/stressed about related to your housing situation?
- What help, if any, has your CHW provided to help with your housing needs?
- Do you feel like you are able to stay on top of your housing needs?
    - Does your CHW help you stay on top of these?
- Can you tell me about your housing history/experience before your current location?
- Have you had housing struggles during/after your most recent pregnancy?
- Did you have housing struggles during/after your previous pregnancies?

- (If currently renting) - Tell us about your experience with your current landlord.
- (If rented in the past) - Tell us about your experience with previous landlords.
- Do you feel like landlords have treated your fairly?
- Do you think landlords have discriminated against you in any way?
- Have you ever been evicted?
    - If so, can you tell us about that experience?
- Does your housing situation affect your participation in the Pathways program?

Employment Questions:

- What is your current employment status?
    - Has this changed in the last 6 months due to Covid-19 or other circumstances?
    - What type of job do you work?
- How do you feel about your current employment situation?
- Do you feel that your employment is affecting (or affected) your pregnancy in any way?
- Does your employment situation affect your participation in the pathways program?

Transportation Questions:

- What is your current transportation situation?
- How do you get around most frequently?
- Do you feel that your transportation is affecting (or affected) your pregnancy in any way?
- Does your transportation situation affect your participation in the pathways program?
- Does transportation affect your ability to get to doctors' appointments?

Childcare Questions:

- If you already have children or have given birth, what is your current childcare situation?
- Do you feel that concerns are childcare are affecting (or affected) your pregnancy in any way?
- Does your childcare situation affect your participation in the pathways program?

General Check in Questions:

- How have you been doing since we last spoke?
- How is your current stress level on a scale of 1-10?
- What things cause you the most worry or concern in your daily life?
    - Are you receiving any help regarding those things?
    - Are there people that you can talk to about those things?
- Is there any kind of help or support that you feel you need, but aren't getting?
- Can you give me an update on your progress of the pathways you were working on last month?
- Have there been any major changes in your life that you would like to share? (Housing, Transportation, Childcare, Partnership Status, Employment, etc.)

Support Network Questions:

- How would you describe your support network?
- Other than your CHW, do you have people in your life that you feel you can turn to for help and emotional support?
- Do you know other moms in Pathways that you can talk to or go to for support?
- Do you know other moms NOT in pathways you can talk to or go to for support?
- Would it be helpful to be connected to other Pathways mom?

CHW Questions and Current Pathways Updates:

- What is the name of your CHW?
- Has your CHW talked with you all the different needs/pathways the HUB can help you with?
- How is your relationship with your CHW?
- Do you feel like you have been getting the help you need from your CHW?
- What has been going well for you and your CHW in the Pathways program while working on your needs?
- What is not going well?
- Do you feel like you have been getting the help you need from your CHW?

- Have you started working on any new needs or goals with your CHW?
- Are there any needs or goals you have thought about starting on?
- Are there any pathways/needs that you started on but haven't made much progress with? Why?
- How many times have you made unscheduled calls/texts to your CHW in the last month? What were these specifically for?
- Do you ever worry that you are asking too much from your CHW?
- Does that keep you from asking for more?
- Are there things you are reluctant/don't want to ask about?
- Can you describe how a typical call/meeting with your CHW goes?
    - Have you been talking only over the phone?
    - Has this affected the strength of your relationship?
- When working with your CHW, is their style more tough love or more friendly?
- Have you had any disagreements with your CHW?

General Pathways Questions:

- How long have you been enrolled in the Pathways HUB/Working with your CHW?
- How did you learn about the HUB?
- Do you anticipate or did you anticipate when starting pathways, that the program would assist you with your stressors?
- Can you explain your enrollment process?
- Can you tell me what you remember from your first week in the program?
    - First weeks after pregnancy?
    - What helped/worked well with your CHW during that time?
- What assistance or help from pathways has been particularly effective?
- Do you have any current needs that pathways/HUB can't seem to address?

- Are there any pathways/programs/applications that you complete that you did not feel were helpful or worthwhile?
- Which pathways are you currently working on?
- Do you feel like you understand the pathways program?
- Do you understand the resources it offers?
- What's confusing about your CHW/Pathways?
- Do you feel that you have been getting the help you need from the agencies and programs in your pathways?
- What programs, services, and/or agencies have you had the most contact with? What are they helping you with?
- Have you explored any services or programs outside of the help you are getting from your CHW?

Perspective on Pathways/Big Picture Questions:

- What do you think are the goals of the Pathways program? Or what would you say is its main purpose?
- Do you think it has served this purpose for you personally?
- Who you think the pathways program is designed to serve? Who does it serve best?
- Did you receive an informational or "welcome" packet in the past few months?
    - If yes, did this give you a good idea of what pathways is all about?
- What has been the hardest part about being a mom in your particular circumstances?
- If you could go back to your early pregnancy or pre-pregnancy (first) what do you wish someone could have helped you do differently?
- Is there anything the Pathways could have offered that would have made things different for you and your children?
- What was the biggest benefit you got from being part of the Pathways HUB?
- Do you feel that your quality of life improved because of the help you got to address your needs?
- Do you feel that your stress level was impacted by the help you got to address your needs?

- If you could change one thing about the help you received that would have made your pregnancy/experience less stressful, what would it be?

Education Questions:

- What is your highest level of school you finished?
- Can you tell me about why you stopped school at that point?
- Did anything make it hard for you to keep going to school?
- When you stopped, did you want to continue?
- Do you feel like you get treated differently based on how much school you finished?
- Have you ever had to choose getting a job instead of doing more school?
- Is it a goal for you to do more school at some point in the future?
    - Why or why not?
- Have you ever talked with your CHW about doing more school?
- What barriers would get in the way of you continuing with more school?
- What kind of supports would you need to make going to school easy to do?
- Are you currently enrolled in any education or training programs?

Family Planning Questions:

- What or who influences your family planning choices?
- How does your CHW approach family planning?
- Does the perspective of doctors, case workers, support agencies, friends, or family influence your decisions on family planning?

The Impact of Medical Care and Medical Experiences Questions:

- Have any experiences with medical care you have received affected your personal views or feelings about pregnancy?

- Have any experiences with medical care you have received affected your personal feelings about healthcare providers, whether that be primary care physicians or OBGYNs?
- Do you feel like your OBGYN listens to you?
- Do you feel like you understand what your OBGYN tells you?

General Practitioner Questions:

- Do you currently have a general practitioner doctor you see for your personal health needs?
- If yes:
- How did you find them?
    - How long have you been seeing them?
    - What is your doctor's race and gender?
    - What do you like about them?
    - What do you dislike about them?
    - Do you trust them?
    - Do you feel like they communicate well?
    - Do they listen to you?
    - Do you understand what they tell you?
    - Do you like the staff in their office?
    - Was it easy to get an appointment?
- If no:
    - If not, why not?
    - Why did you leave your previous doctor?
    - Did insurance or lack of insurance prevent you from seeing one?
- Have you ever talked with your CHW about finding a doctor?
    - How was that experience?
- What do you/did you look for in a doctor?

OBGYN Questions:

- (Most interviews combined the questions above for OBGYN questions, too)
- Do you currently have an OBGYN you see or one you saw while pregnant?
- How did you find them?
- How is your relationship with your OBGYN?
- What did you look for in a doctor?
    - How long have you been seeing them?
    - What is your doctor's race and gender?
    - What do you like about them?
    - What do you dislike about them?
    - Do you trust them?
    - Do you feel like they communicate well?
    - Do they listen to you?
    - Do you understand what they tell you?

Baby's Pediatrician Questions:

- If delivered, do you have a doctor for the baby?
- How did you find them?
- If you have other kids, do they all see the same pediatrician?
- How did you find your pediatrician?
- What do you/did you look for in a pediatrician?
    - How long have you been seeing them?
    - What is the doctor's race and gender?
    - What do you like about them?
    - What do you dislike about them?
    - Do you trust them?

- Do you feel like they communicate well?
- Do they listen to you?
- Do you understand what they tell you?

Medical Advocacy Questions:

- Has there ever been a time when a doctor (GP, OB, or Pediatrician) confused you?
  - If yes, please explain.
  - If yes, what did you do?
- Have you ever asked for an explanation of something you didn't understand?
- Has there ever been a time when a doctor made you uncomfortable?
  - If yes, please explain?
  - If yes, what did you do?
- Has there ever been a time when you felt a doctor made a decision for you that you did not agree with?
  - If yes, please explain.
  - If yes, what did you do?
- Have you ever felt not heard by a doctor?
- Do you feel like you can speak up to your doctors in these situations?
- Have you ever had an issue with a doctor that you discussed with your CHW?
- Has there ever been a time you couldn't get ahold of a doctor when you needed to? Or couldn't make an appointment?
  - If yes, explain the situation and what you did.
- What do you do if you can't get ahold of a doctor?
- Are you aware of a nurse hotline after hours?
- Have you ever used telemedicine?
- How confident do you feel to ask questions of a doctor?
- How confident do you feel to make decisions for yourself?

Appendix IV: Agency Survey ***Introduction Letter (Email)***

Dear____,

As an agency who works with clients in the NW Ohio Pathways HUB program, we would like to invite you to participate in a research study Creating Stronger Pathways to Infant Vitality through Participant Research ("Stronger Pathways") funded by the Ohio Department of Higher Education. The goal of the research is to assess the Pathways HUB to improve program performance and deliver even better results for mothers and babies in NW Ohio. This study is being conducted through a partnership between HCNO, Bowling Green State University, and ProMedica.

Pathways Agency partners are being invited to participate in the Stronger Pathways Study in two distinct ways. First, we are recruiting Community Health Workers from across partner agencies to participate in paid interviews with our researchers about their work with the HUB. Second, we are surveying partner agency personal to gather the agencies perspectives on the HUB.

CHW Participation:

Currently, your agency is well/moderately/underrepresented in our CHW cohort. As a result of this underrepresentation study results may not accurately reflect the perspective and work of your agency. We would like to encourage you to ask your CHW's to participate, and if you see fit, to nominate a couple to participate as agency representatives. CHW's interested in participating in interviews or recruitment, or who would like further information about doing so can also contact us by email at info@strongerpathways.org or calling (567)-698-8010. For your convenience we have attached a CHW recruitment information JPEG to this email.

Agency Personnel Survey:

We would like to ask your help in identifying the appropriate personnel, names and emails, from your agency to respond to our partner agency survey. The survey will focus on agency-HUB relationships, agency perspectives on the pathways model, HUB management, coordination, and client support. You may recommend more than one survey recipient. If you have any questions or concerns about study participation, please reach out to Dr. Nichole Fifer fifenic@bgsu.edu or Dr. Justin Rex jmrex@bgsu.edu.

Agency Survey Recipients:

	Name	**Email**
1		
2		
3		
4		
5		

Appendix V: Agency Survey

Introduction

1. Name
2. Organization
3. What is your current role in your organization?
4. How long have you been working with the HUB at your current position and in any other capacity?
5. In your current role how much of your work consists of interactions and case management from HUB clientele?

HUB Processes and Management

6. Do you feel that you understand the Pathways HUB as it currently operates? (YES/NO)
    a. IF YES
        i. What do you think are the strengths of the Pathways HUB as it currently operates?
        ii. What do you think are the weaknesses of the Pathways HUB as it currently operates?
        iii. Are there any changes you would recommend to the way that the HUB is structured or operates in general?
7. Do you think communication (information and feedback) between HUB administrators and agency personnel is effective? Please explain.
    a. What do you think would make this communication more effective?
8. Do you think that HUB administrators are responsive to your concerns? Please explain.
9. What do you see as the greatest challenges of the HUB, now and in the future? Please explain.
10. What do you think “success” looks like for the Pathways HUB? Please explain. a. What would it take for the Pathways HUB to be successful in this way?

Client Interactions, Service, and Retention

11. Do you think that the HUB referral system, as currently designed, works well? Please explain.

12. Do you feel that you have access to all the information and resources that you need to serve your clients well? Please explain.
13. Is there any additional support or resources that the HUB could provide to help you serve your clients well? Please explain.

Clients/Pathways

14. Do clients in your organization have specific barriers to completing Pathways? If so, please explain.

Overall Assessment

15. If you could change one thing about the program that would help it work better for your clients, what would that be?
16. Is there anything we haven't asked you about that you would like to tell us?

Appendix VI: Focus Group Questions for HCNO Staff

I. Explanation and Participation: (2 minutes)

Thank you for joining us today for this focus group. We appreciate your willingness to participate. As part of the Stronger Pathways Research Study, we are conducting this focus group to inform our evaluation of the Northwest Ohio Pathways HUB. We need your input and want you to share your honest and open thoughts with us so that we can gather more information about your important work.

Here are a few guidelines for our discussion today:

1. We want you to do the talking. We would like everyone to participate.
2. There are no right or wrong answers. All experiences and opinions are important. Please speak up whether you agree or disagree. You can address each other if you like. We are only here to assist in the discussion.
3. We emphasize that what is said in this room should remain here. You should feel comfortable to share anything if sensitive issues come up. Please don't disparage another participant's remarks and let's have just one speaker at a time.
4. The discussion will last for about one hour. Please silence your mobile phones. Please give everyone the chance to express his/her opinion during the conversation. You can address each other if you like. We are only here to assist in the discussion.
5. The discussion will last for about one hour. We will record this session as we want to capture everything you have to say. We don't identify anyone by name in our findings. You will remain anonymous. Audio recordings will be summarized, and the recordings secured by the PI, Dr. Nichole Fifer/Dr. Justin Rex. Are there any questions?

II. Introductions: (5 minutes)

Can you please tell us your name, your position at HCNO, your primary function in the Pathways Program and how long you have worked with Pathways?

III. Questions and Discussion: (60 minutes)

A. Client Interactions, Service, and Retention

Intro: We would like to better understand the way that clients interact with the HUB and Pathways personnel.

1. How are participants recruited to the program?
    a. Is there a set structure for communication with new participants?
2. What are the main recruitment barriers?
    a. What could the organization do better to recruit more clients? (opportunity)
3. Why do you think some mothers do not complete all their pathways? Why do they fall out?
4. What is the process for responding to a mother who hasn't been in contact?
5. Are participants given direction on what to do if their CHW stops communicating?
6. From your perspective, what are the benefits to mothers for staying in the program? What are the incentives for them?

B. Program Implementation and HUB Operations:

Intro: Now we would like to talk a little bit about the way that the HUB operates and the way that the Pathways program works and is managed

1. What is in the Welcome Packet? Who designed the packet and was there any alternative before the current packet?
    a. Why create a standardized welcome packet rather than leave to discretion of individual organizations/CHW's?
2. What is your understanding of the "mom driven approach"?
    a. How much driving is the mom doing vs. the CHW in theory and in reality?
3. From your perspective does the home agency of the CHW have a great impact on outcomes for program participants?
4. How well does information flow across HUB stakeholders internal and external?
    a. In your opinion, how well does the HUB communicate with participants/clients? Why?

   b. In your opinion, how well does the HUB communicate with partners?

   c. In your opinion, how well does the HUB communicate with CHW's?

5. Do you feel that you have access to all the information and resources that you need to do your job well?
6. How would you describe the HUB's decision processes?
   a. Mostly top-down or bottom-up? Why?
7. Does the system, as designed, pivot well to meet challenges and changing conditions? (Example COVID-19)

C. SWOT:

Intro: We would like to talk a little bit about the HUB's strengths, weaknesses. Additionally, we would like to explore what you see as the opportunities, and threats the HUB is facing.

1. In your opinion, what are the strengths of the Pathways HUB as it currently operates?
2. In your opinion, what are the weaknesses of the Pathways HUB as it currently operates?
3. Is there anything about HUB structure/processes that prevents it from achieving its goals?
4. How would you improve the structure/processes of the HUB?
   a. Where/how do HUB processes excel? What is the best/most successful part of the process?
   b. Where/how do the HUB processes miss the mark? What are some areas of improvement?
5. Is there anything that you can think of that would be a threat to the continuation or sustainability of the Pathways Program as it is today?
6. Are there any opportunities that you think the HUB should be focused on to improve, expand, or change in the near future?

D. Wrap Up Questions

Intro: We are almost finished with our questions, just a few more and then we will ask you or any final thoughts you may have.

1. If you could change one thing about the way the HUB operates, what would that be?
2. Do you have any other comments or thoughts that we did not address in the questions we've asked?