

# What is ACCORDS?

Adult and Child Center for Outcomes Research and Delivery Science

ACCORDS is a 'one-stop shop' for pragmatic research:

- A multi-disciplinary, collaborative research environment to catalyze innovative and impactful research
- Strong methodological cores and programs, led by national experts
- Consultations & team-building for grant proposals
- Mentorship, training & support for junior faculty
- Extensive educational offerings, both locally and nationally



# ACCORDS Upcoming Events – mark your calendars!

January	<ul style="list-style-type: none"><li>• January 12 – ACCORDS Grand Rounds, Bethany-Rose Daubman, MD</li><li>• January 15 – D&amp;I Science Graduate Certificate application launch</li><li>• January 28 – ACCORDS/CCTSI Community Engagement Forum</li></ul>
March	<ul style="list-style-type: none"><li>• March 9 – ACCORDS Highlights, Megan Abbott, MD</li></ul>
April	<ul style="list-style-type: none"><li>• April 8 &amp; 9 – D&amp;I Science for Researchers Workshop</li><li>• April 13 – ACCORDS Grand Rounds</li><li>• April 24 – ACCORDS/CCTSI Community Engagement Showcase</li></ul>
May 20-21, 2026	Colorado Pragmatic Research in Health Conference <i>Pragmatic Research: Methods, Tools, and Technology for Rapidly Changing Contexts</i>

Full list of events and dates are available on ACCORDS Education website



# Studies from the Prevention Research Center for Family and Child Health



**Mandy Allison, MAEd, MD, MSPH**

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CHILDREN'S HOSPITAL COLORADO



# Maternal and Child Health at the Prevention Research Center for Family and Child Health (PRC): *Insights from NFPx and ENRICH*

Mandy A Allison, MD MSPH

Andrea Jimenez-Zambrano, PhD MPH

and team members at the

Prevention Research Center for Family and Child Health

(<https://medschool.cuanschutz.edu/accords/cores-and-programs/prevention-research-center-for-family-child-health>)

[medschool.cuanschutz.edu/ACCORDS](https://medschool.cuanschutz.edu/ACCORDS)







# Prevention Research Center for Family and Child Health

*We are devoted to fostering healthier and more equitable communities for children and families to flourish through evidence-based interventions, programs, and policies focused early in life.*





# Multi-Disciplinary Team

Pediatrics

Caregiver-child  
interactions and  
child development

Developmental  
Psychology

Maternal and early  
childhood home-  
visiting

Maternal perinatal  
health

Community  
engagement

Cross-Sector  
collaboration

Evidence-informed  
policy

Mixed methods,  
pragmatic trials,  
implementation  
science





## Caregiver-child relationships

- DANCE
- PUPPETalk

## Perinatal health

- Pregnancy and Parenting Partners (P3)
- Perinatal workforce (School of Nursing partners)

## Cross-sector collaboration

- Early Intervention, primary care, and home-visiting
- Primary care redesign
- Systems for Action

## Nurse Family Partnership (NFP)

- Original randomized clinical trials
- Global replication
- NFP expansion (NFPx)

## Current NFP implementation and effectiveness

- Black mother's experience in NFP
- Child welfare
- NFP client and nurse retention

## Home-visiting innovations

- Addressing IPV
- ENRICH (cardiovascular health)
- Addressing mental health and substance use







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# NFP<sub>x</sub>

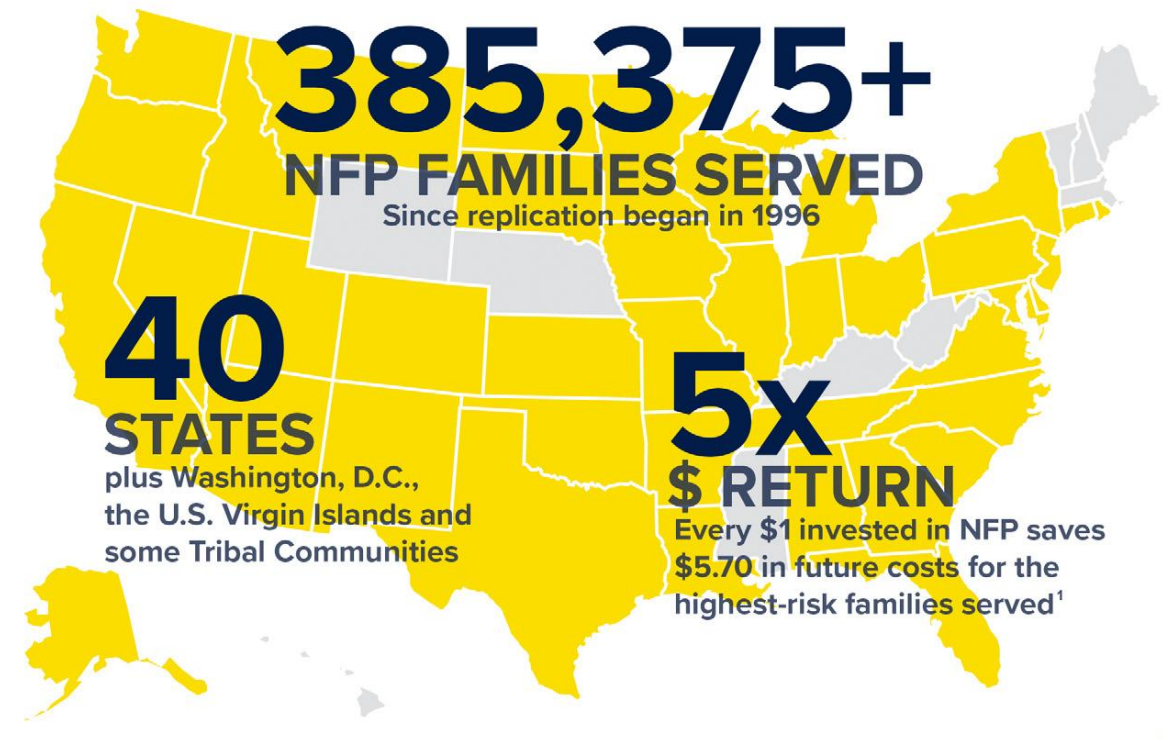






# Nurse-Family Partnership (NFP)

- Prenatal and early childhood home visiting by nurses
- Pregnant individuals
  - No previous live births
  - Enrolled prior to 28 weeks gestation
- Overlapping adversities or risks for poor health outcomes
  - Poverty
  - Low education
  - Young age
  - Chronic illness (mental and physical health)





# NFP's Three Goals



Improve  
pregnancy  
outcomes



Improve  
child health  
and  
development



Improve  
maternal  
health and  
life-course





# US Randomized Clinical Trials of NFP Program

## Elmira, NY 1977



**N = 400**

## Memphis, TN 1987



**N = 1,138 and  
N=742**

## Denver, CO 1994



**N = 735**





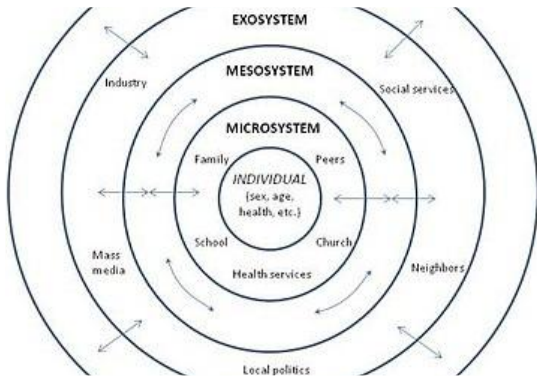


# NFP Expanded Eligibility Initiative or NFPx





# Behavioral and biological reasons why NFP may be different for people with previous live births



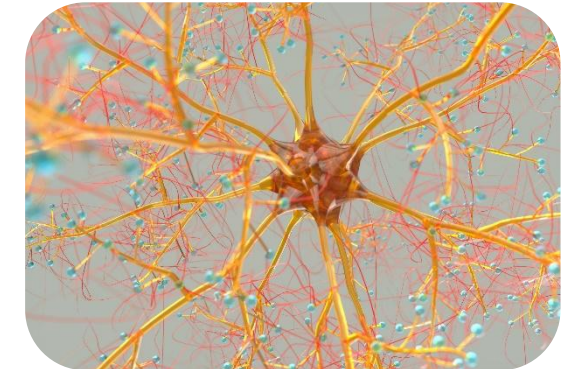
Human Ecology Theory



Attachment Theory



Social Cognitive/ Self  
Efficacy Theory

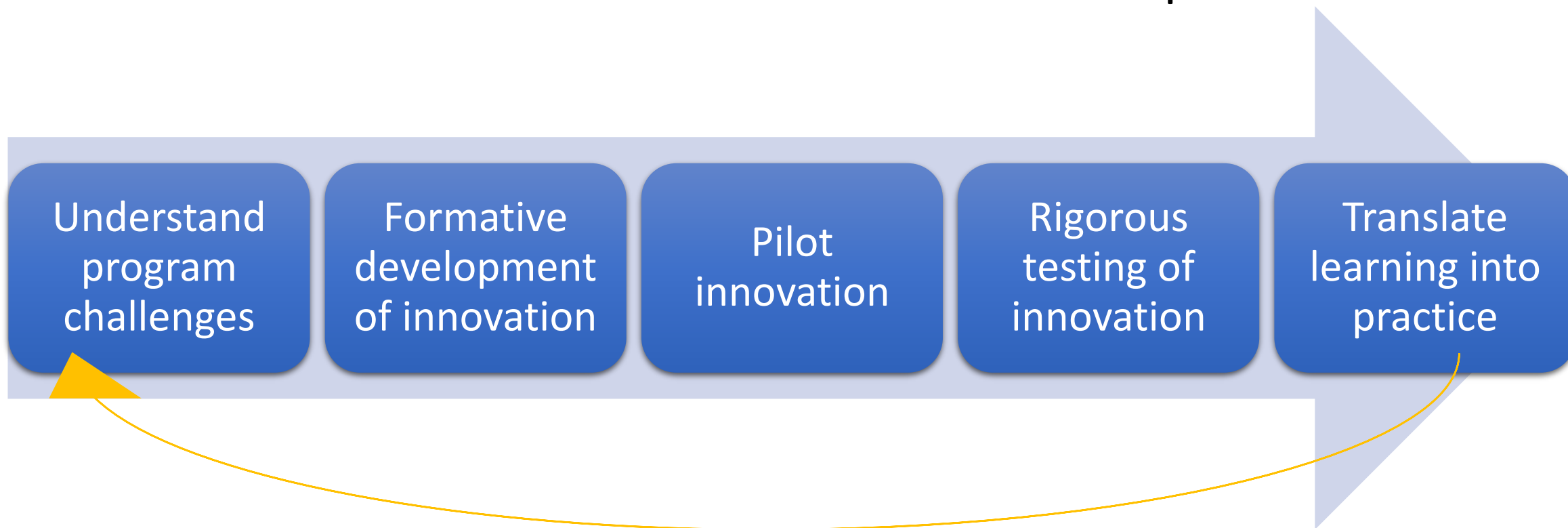


Biology  
(Neuroendocrine  
changes)





# NFP Model for Innovation Development



Olds, Donelan-McCall, O'Brien, MacMillan, Jack, Jenkins, Dunlap, O'Fallon, Yost, Thorland, Pinto, Gasbarro, Baca, Melnick & Beeber (2013). Improving the Nurse-Family Partnership in Community Practice. *Pediatrics*, 132, S110

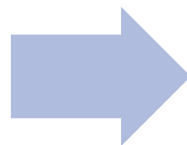






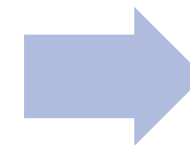
## Formative Study (2017-2021)

- 35 teams in 28 sites in 15 states
- Feasibility
- Acceptability
- Requirements for serving people with previous live births (multiparous or 'multips')



## Quasi-Experimental Design Pilot Study (2020-2022)


- Compared multip NFP clients to similar multips covered by Medicaid
- NFP sites successfully enrolled multips with risk factors for poor outcomes
- NFP did not appear to improve birth outcomes
- Participation in NFP was associated with increased receipt of postpartum visit and recommended well child care



## Florida Pilot focused on 'late' referrals and enrollments (2020-2023)

- Late referrals were more likely to be multiparous, receive late prenatal care, report smoking, be an immigrant
- Late registrants had fewer visits during pregnancy, better retention at 12 months, similar or better rates of screening
- Program outcomes were similar for late registrants and those enrolled prior to 28 weeks

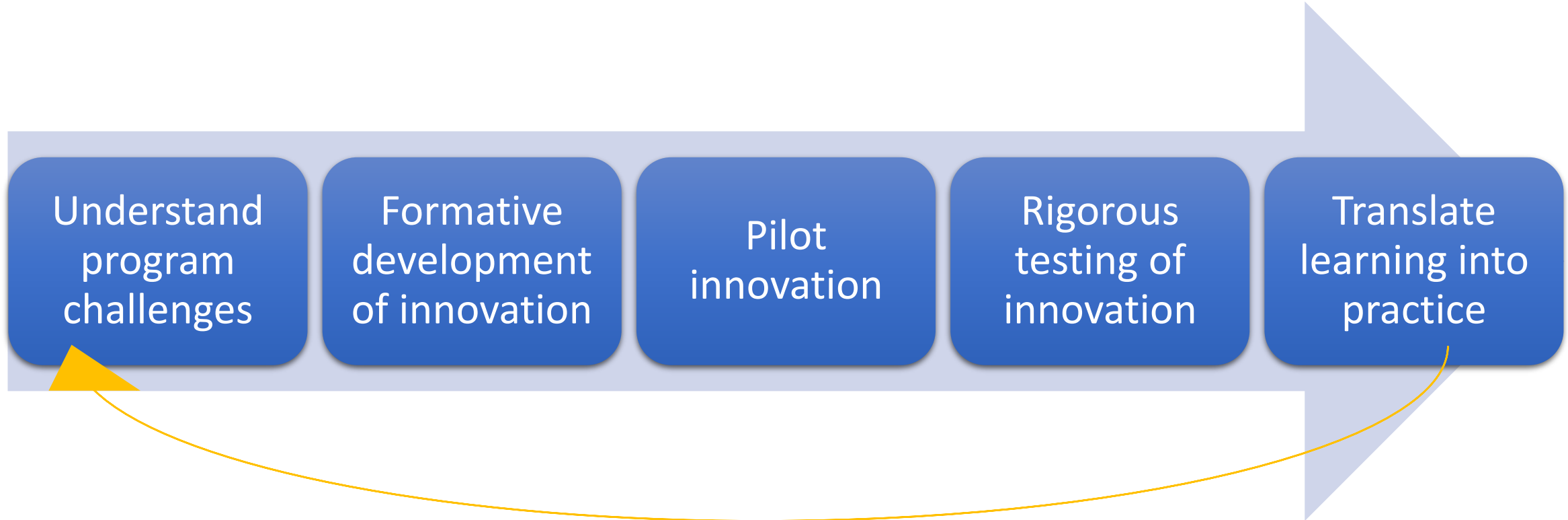


A pregnant woman is shown from the waist up, wearing a dark dress with a white and blue floral pattern. She is holding her large, rounded belly with both hands. The background is a soft-focus green, suggesting an outdoor setting with foliage.

When do we  
have enough  
data to decide if  
expanded  
eligibility for NFP  
should become  
standard of  
practice?



# NFP Model for Innovation Development



Olds, Donelan-McCall, O'Brien, MacMillan, Jack, Jenkins, Dunlap, O'Fallon, Yost, Thorland, Pinto, Gasbarro, Baca, Melnick & Beeber (2013). Improving the Nurse-Family Partnership in Community Practice. *Pediatrics*, 132, S110







## What do we know now that we did not know in 2017?

- NFPx meets community need and reaches those at risk for poor health outcomes
- Serving multiples and late registrants is feasible and acceptable
- Requirements for serving multiples and late registrants
- NFP is associated with increased receipt of preventive care for multiples
- NFPx does not appear to affect 'standard' NFP delivery

## What are the research gaps?

- Impact of NFP for people with previous live births on:
  - Maternal stress/maternal flourishing
  - Birthing and postpartum experience
  - Tobacco and other substance use
  - Parenting and home environment
  - Injury prevention for index child
  - Behavior and development of index child
- Effect of home-visiting on siblings in the home
- Return on investment





# Randomized Clinical Trial of NFP Impact in Ohio

Recruiting 500 pregnant people with previous live births (multips)  
experiencing risk factors for poor maternal-child health outcomes

Brighter Futures NFP, Dayton,  
OH

Center for Family Safety and Healing NFP,  
Columbus, OH/ Nationwide Children's Hospital

Parent Advisory Board

Help Me Grow—Coordinated Intake  
and Referral System



Randomized

250 Multips referred to NFP  
250 Multips receive 'usual care' including referrals to other community resources (comparison group)

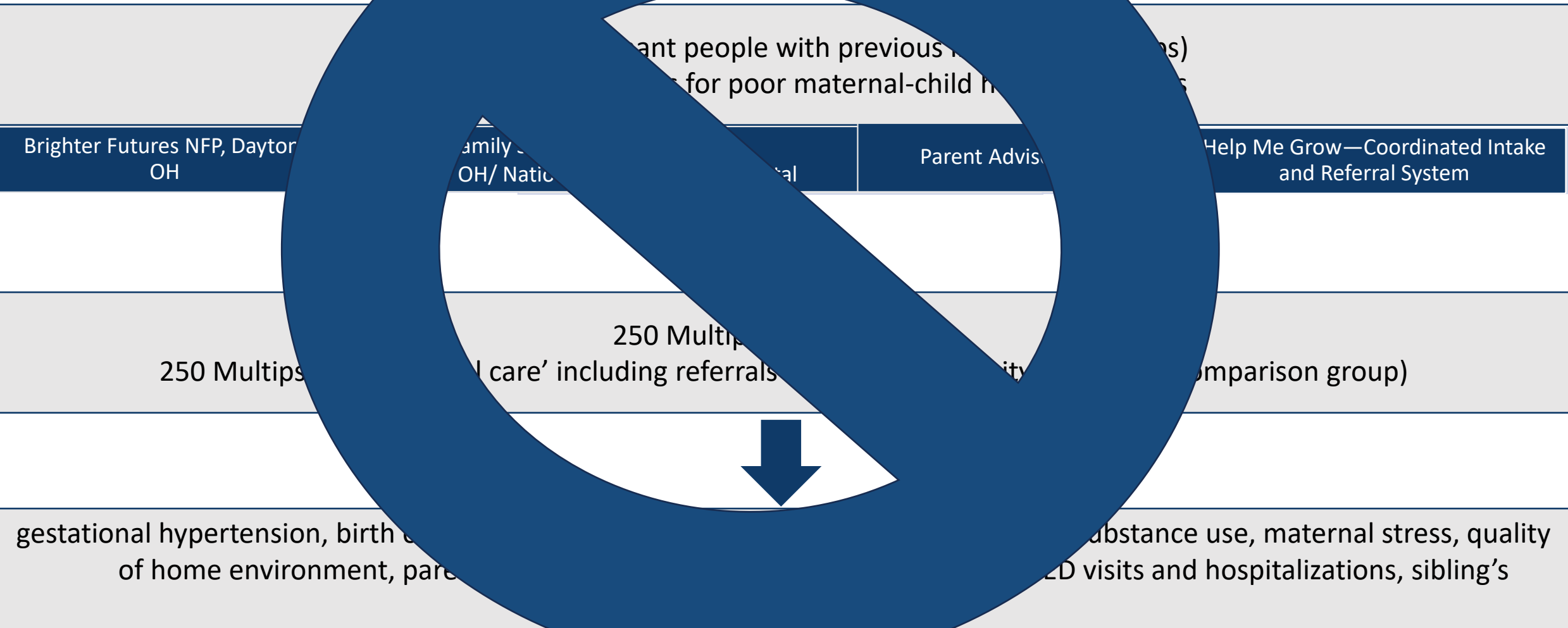


Data collection visits: baseline, 36 weeks pregnancy, postpartum, 6 months, 12 months, 18 months, 24 months  
Outcomes: gestational hypertension, birth outcomes, breastfeeding, maternal tobacco and other substance use, maternal stress, quality of home environment, parent-child interaction, child's development, child ED visits and hospitalizations, sibling's cognitive development





# Randomized Controlled Trial in Ohio







Challenges to individual randomization and lower than expected enrollment in NFP

Roll out design? Cluster design?  
Quasi-experimental design

Challenges to recruitment

Increase number of recruitment sites by  
switching to remote data collection

Time required to measure child development outcomes  
for intervention starting in pregnancy

Shift primary focus to caregiver-child interaction  
measures

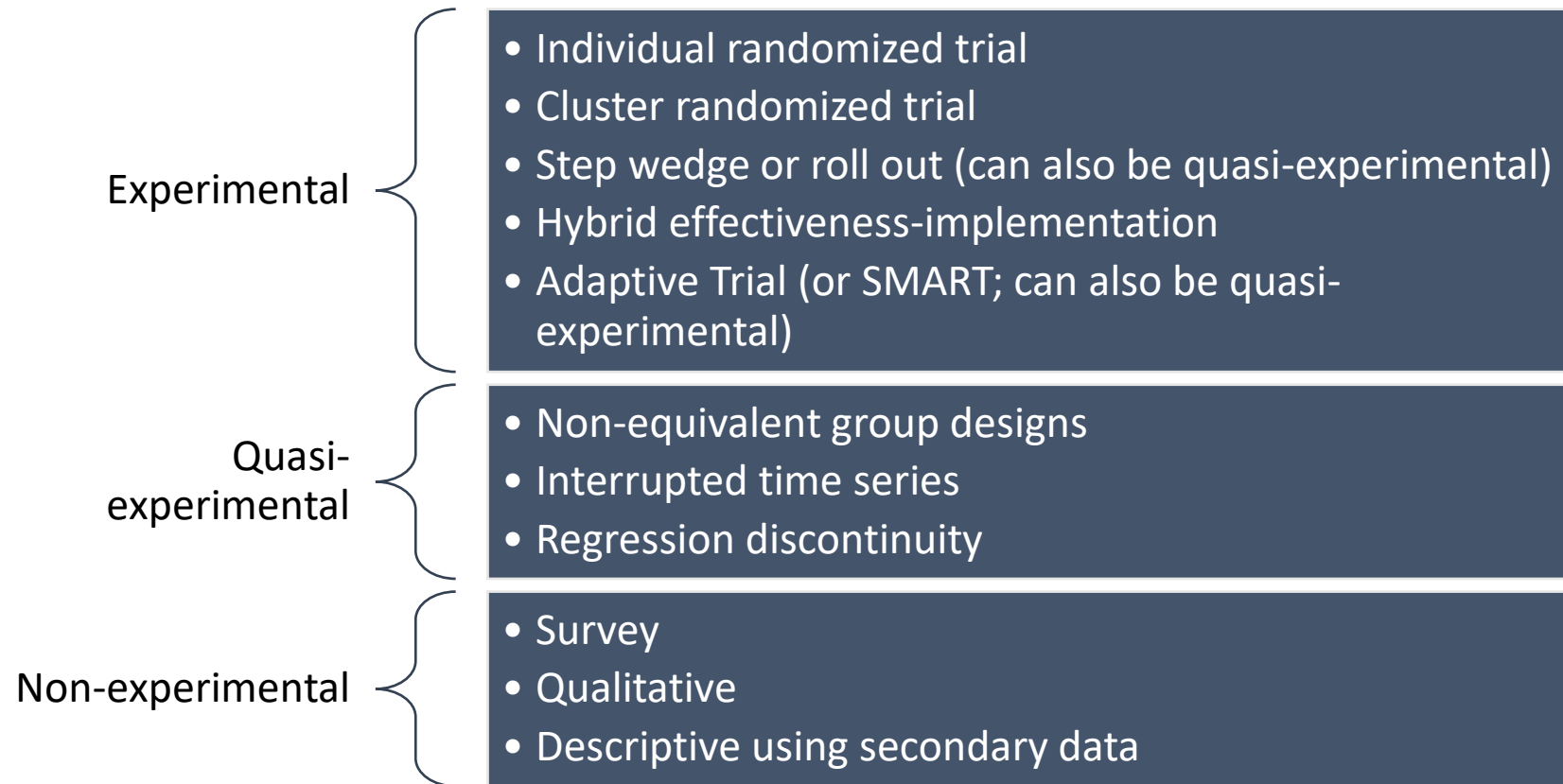
Expense

Smaller sample size (different primary outcomes)  
Shorter timeline and fewer data collection visits  
Less expensive measures (less staff time)





# Research Methods





# Revised Trial of NFP for People with Previous Live Births

Recruiting 250 pregnant people with previous live births (multips)  
experiencing risk factors for poor maternal-child health outcomes

7 existing NFPx sites around the country (with additional pending) and 'matched' community partner such as centralized intake and referral, WIC, community health center serving pregnant women



125 Multips enrolled in NFP are recruited soon after NFP enrollment  
125 Multips receiving 'usual care' including referrals to other community resources (comparison group)



Data collection visits: baseline, postpartum, 6 months, 9 months  
Primary Outcomes: appropriate gestational weight gain, birth experience, breastfeeding, caregiver-child interaction, sibling behavior and socio-emotional development







# Design aspects to increase validity of quasi-experimental design



**Ensure that program and comparison groups are highly similar in observable pre-program characteristics**

Recruiting participants from 'matched' geographic areas

Use of baseline covariates

Some outcomes measured before and after intervention delivered



**Study design and primary analysis pre-specified**



**Outcome data collected in the same way for both groups**



**Follow the same practices that a well-conducted randomized controlled trial follows to produce valid results (other than the actual random assignment)**

Prevent attrition

Intent-to-treat analyses





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# Next steps



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# The ENRICH Study

*Early Intervention to Promote Cardiovascular Health of Mothers and Children*

*MPIs: Mandy Allison, MD, MSPH and Kate Sauder, PhD*

*ESI: Andrea Jimenez-Zambrano, PhD, MPH*



# What is ENRICH?

## *Evidence-Based Home Visiting*



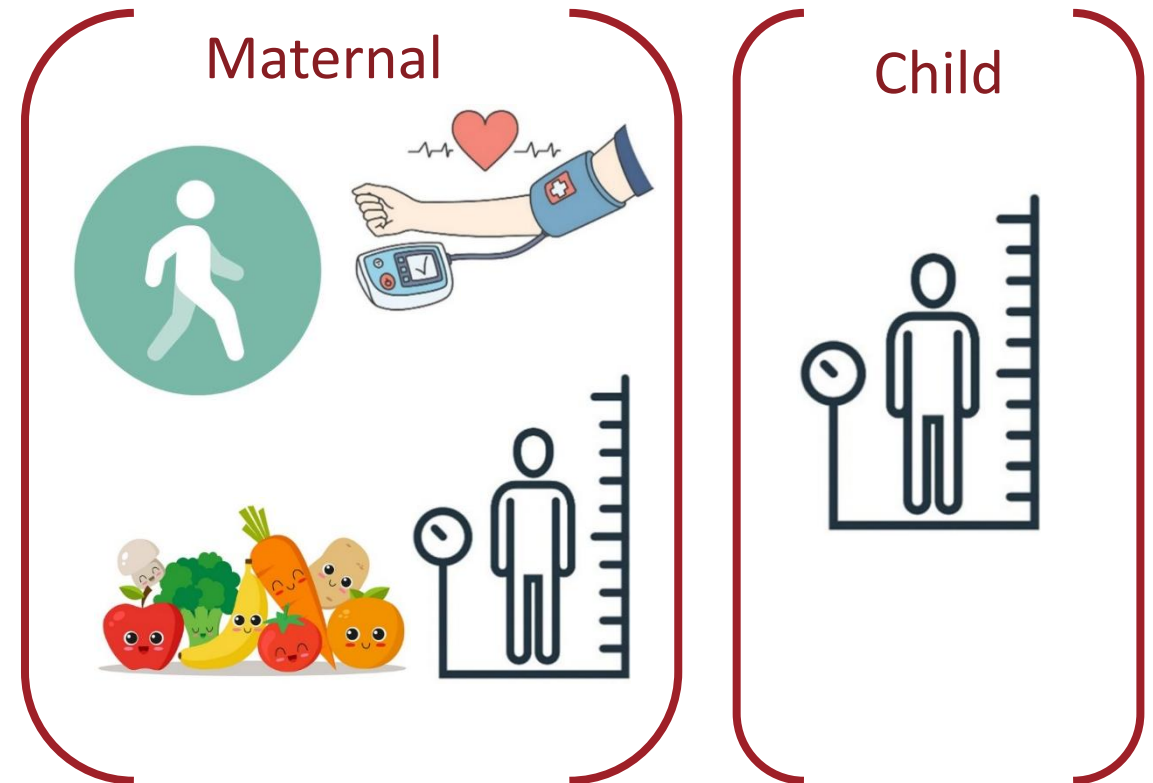


# Who is participating in the study?



# Primary Study Aims

- Evaluate CVH among adults who receive HV enriched with CVH promotion content in the prenatal and postpartum periods compared to adults with HV without enriched content.
  - MEPA diet quality score
  - Time spent in moderate and vigorous physical activity
  - BMI
  - Blood Pressure (BP) at 12 months postpartum (primary endpoint)
- Evaluate CVH among children who receive HV enriched with CVH promotion content in the postpartum period compared to children with HV without enriched content.
  - BMI z-scores at 24 months postpartum (secondary endpoint)



# Implementation Study

- What intervention components and how much of the intervention (dose) did participants receive as part of ENRICHed HV?
- What was the context of the HV agency and service delivery system?
- To what extent did supervisors and HVerS adopt (deliver) ENRICHed HV?



Construct	# Items	Measure	Participant	Timepoint	
				Baseline	12m
Implementation Outcomes (RE-AIM)					
Reach	TBD	Aggregate level site/model data	N/A	Final year of ENRICH	
Adoption	15	Evidence-Based Practice Attitude Scale <sup>271</sup>	HVer, S	X	X
	3	Organizational Readiness to Change Assessment <sup>272</sup>	HVer, S	X*	X*
Implementation	N/A	ENRICHed HV Content Visit Log	HVer	Every home visit	
	N/A	Length of HV Enrollment	HV admin data	Final year of ENRICH	
Maintenance	40	Program Sustainability Assessment Tool <sup>273</sup>	HVer, S	Final year of ENRICH	
Implementation Context (PRISM)					
Intervention					
Participant Perspectives	TBD	Satisfaction with ENRICHed HV Intervention	ENRICH participant	At 24 mo outcomes data collection	
Organizational Perspectives	4	Mission Alignment <sup>274</sup>	HVer, S	X*	X*
	12	Innovation <sup>275</sup>	HVer, S	X*	X*
	4	CFIR Inner Setting Measure: Implementation Climate <sup>276</sup>	HVer, S		X
	9	Organizational Readiness for Implementing Change (ORIC) <sup>277</sup>	HVer, S	X*	X*
Recipient Characteristics					
Participant	N/A	Participant level demographics, SDOH, and psychosocial measures collected as part of main trial, as detailed in Section 9.1, Table 9.1	ENRICH participant	N/A	N/A
HV Agency Staff	13	Staff demographics (e.g., race, ethnicity, educ, time in role, height and weight)	HVer, S	X	
	3	Self-Efficacy <sup>274</sup>	HVer, S	X*	X*
	9	Maslach Burnout Inventory – General Survey – Short Form <sup>278,279</sup>	HVer, S	X	X
	24	CFIR Inner Setting Measure: Culture; Learning Climate; Leadership Engagement; Available Resources <sup>276</sup>	HVer, S	X	
HV Agency	7	HV Agency Characteristics	Lead	X	
Implementation Strategies (Section 7, Figure 7.1)					
Training	N/A	Interactive Training Content Checklist	ENRICH Trainers	Every Interactive Training	
	N/A	HV Model-Specific Community of Practice (CoP) Session Attendance	ENRICH Trainers: HVer, S	Every model-specific CoP session	

HV: Home Visiting; HVer: Home Visitor; S: Supervisor; Lead: HV Agency Leadership; 12m = 12 Months Following Completion of Training

\*For ENRICHed HV Staff only. Not applicable for Usual HV staff

# Study Design

## **UG3: planning and pilot study**

### **Years 1 & 2**

- Develop new ENRICH-specific intervention materials and integrate with HV intervention
- Evaluate recruitment and data collection procedures
- Gather feedback from participants and local partners
- Work alongside coordinating center and clinical sites to develop common protocol and harmonize intervention

## **UH3: full trial**

### **Years 3-7**

- Enrollment and baseline data collection prior to 34 weeks gestation
- Randomization to ENRICHed HV or standard HV
- Program delivery prenatally through 24-months postpartum
- Outcomes data collection at 12 and 24 months postpartum





## ENRICH Intervention Timeline: Enrollment < 28 Weeks



Start Here

Know Your Health During Pregnancy

Then prioritize the key Physical Activity and Healthy Eating & Weight Modules. (dark pink)

Other Topics:

6 sleep health modules to choose from!

Smoking and Tobacco Use During Pregnancy

4 mental health & stress modules

Physical Activity:

Getting Active

Focus on Your Fitbit (Incentive!)

Plus an additional 9 modules to choose from!

Select among Sugar Sweetened Beverages, Fried Foods, Ultra-Processed Foods, or Restaurant Eating

Healthy Eating & Weight:

Healthy Weight During Pregnancy

Portion Sizes for a Healthy Weight

My Healthy Eating Plate

The client's choice between 4 topics

Plus an additional 20 modules to choose from!

Start with Metabolic Health and Child Modules postpartum, then work in additional parent-focused modules with the child modules based on client's needs

Metabolic Health:

Know your Health Postpartum

BP Check Month 1

BP Check Month 3

15 months

18 months

Child Modules:

1 month

3 months

6 months

9 months

12 months

Consider subbing in ENRICH child materials in place of NFP monthly memos you would typically use!

Tip: Between 12-18 months postpartum may be another opportunity to discuss maternal cardiovascular health topics!

NFP enrollment

Birth of baby

6 months

12 months

18 months

NFP Graduation

Prioritize 'Know Your Health During Pregnancy' then key Physical Activity and Healthy Eating and Weight modules (dark pink)

Each hashmark on the timeline represents 1 NFP visit.



# Current Status

Recruitment  
N=140

Baseline Data  
Collection  
N=127

Implementation  
of Intervention



# Ancillary Study

## Understanding Social Drivers of Cardiovascular Health in the ENRICH Trial Population

# Background

- Promoting and maintaining cardiovascular health (CVH) from pregnancy onward is essential to reducing the intergenerational burden of cardiovascular disease.
- Children born to women with gestational diabetes or other indicators of poor CVH show higher rates of obesity and hypertension at increasingly younger ages, suggesting that risk trajectories begin early in life.
- Social drivers of health—including social support, cultural norms, healthcare access, nutritious food availability, and safe environments for physical activity—strongly influence CVH.
- Although addressing unmet social needs in chronic disease management improves outcomes, current CVH guidelines do not adequately emphasize tailoring interventions to meet these needs.

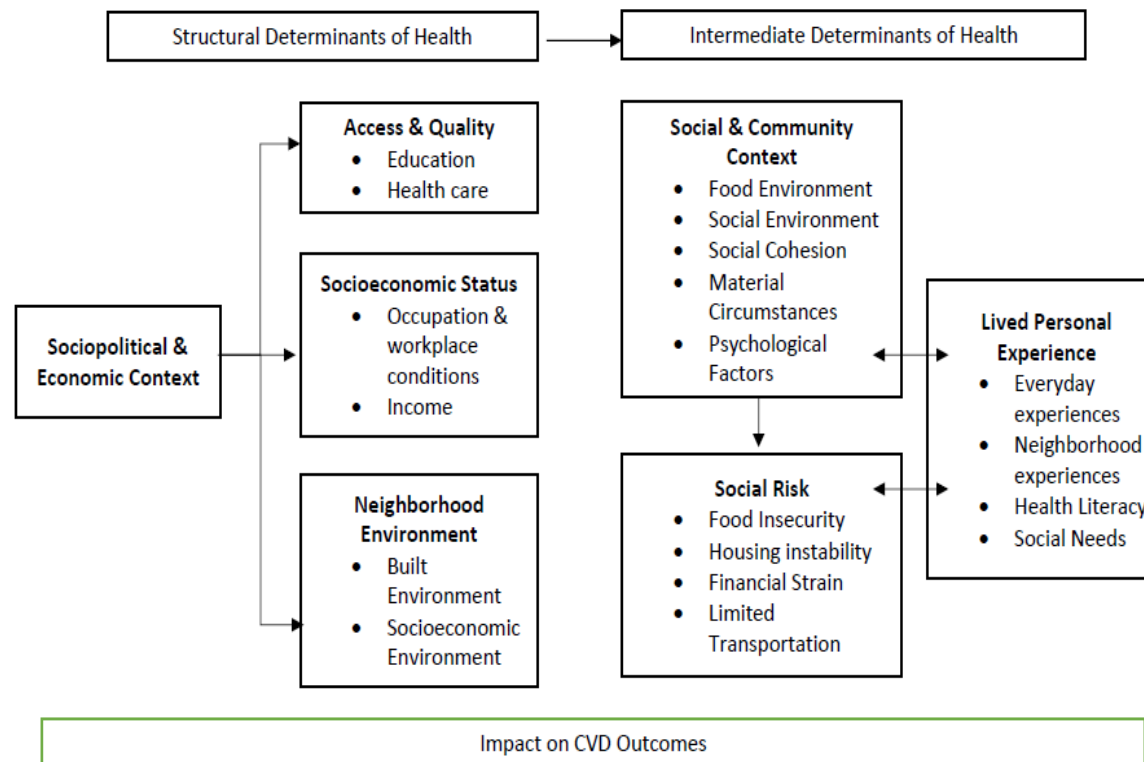


# Aims

1. Characterize the social drivers of health and unmet social needs that may influence NFP clients' ability to engage in CVH promoting behaviors including diet, physical activity, and sleep.
2. Deepen understanding of how social drivers of health and unmet social needs affect NFP clients' ability to engage in CVH promoting behaviors.

# Theoretical Underpinnings

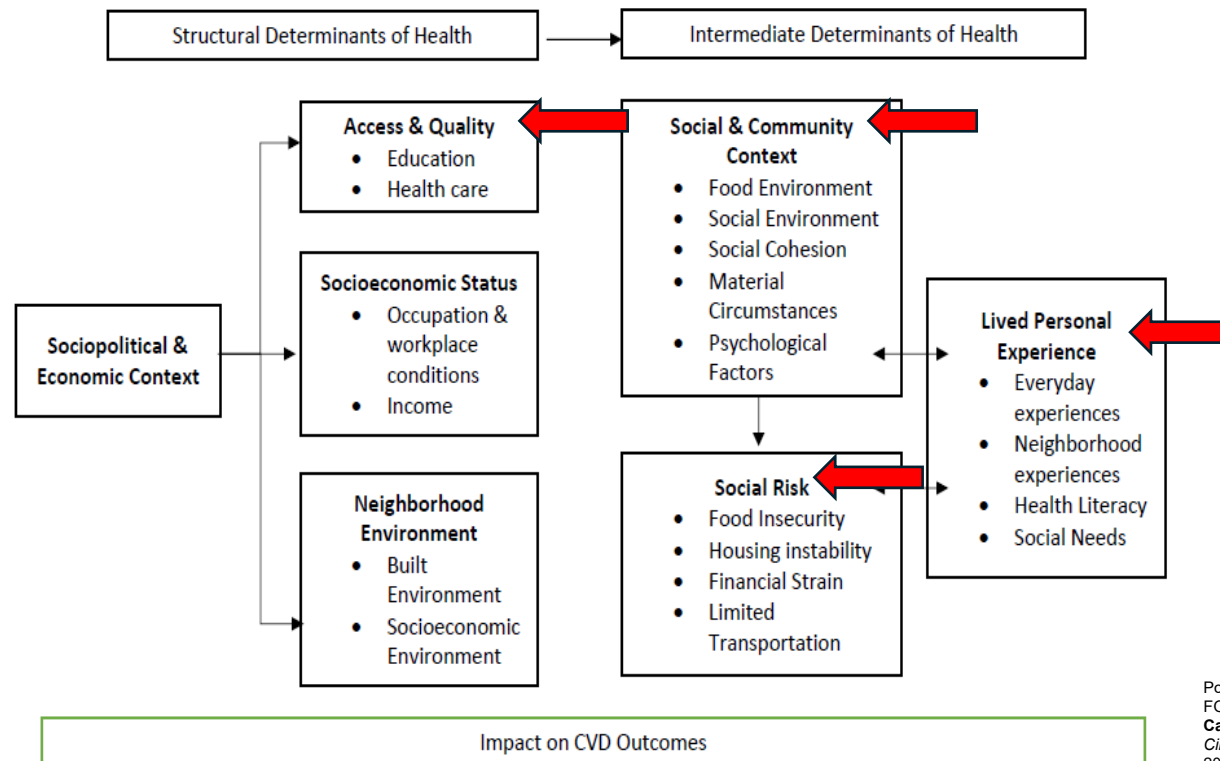
## Critical Framework of Social Determinants of Health (CFSDH)



Powell-Wiley TM, Baumer Y, Baah FO, et al. **Social Determinants of Cardiovascular Disease.** *Circulation Research.* 2022;130(5):782-799. doi:10.1161/circresaha.121.319811

# Theoretical Underpinnings

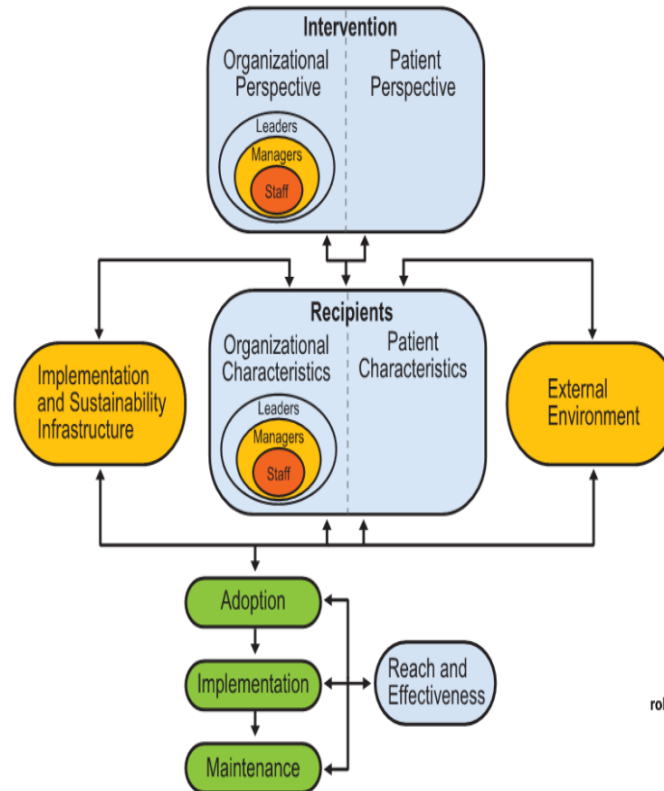
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# Theoretical Underpinnings

## Practical, Robust implementation and Sustainability Model (PRISM)

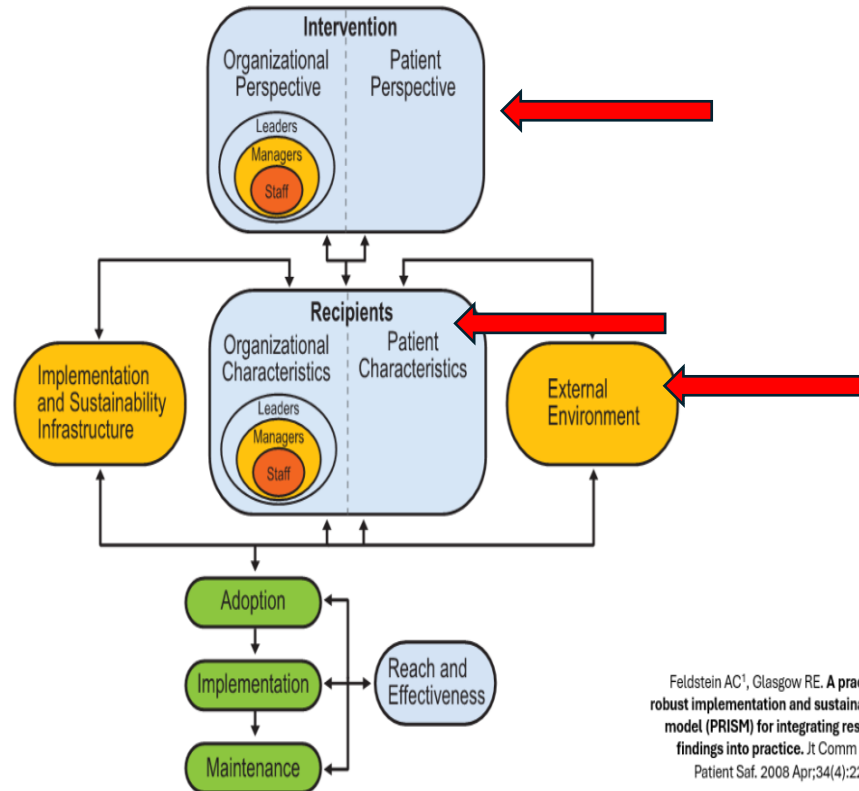


Feldstein AC<sup>1</sup>, Glasgow RE. **A practical, robust implementation and sustainability model (PRISM) for integrating research findings into practice.** *It Comm J Qual Patient Saf.* 2008 Apr;34(4):228-43.



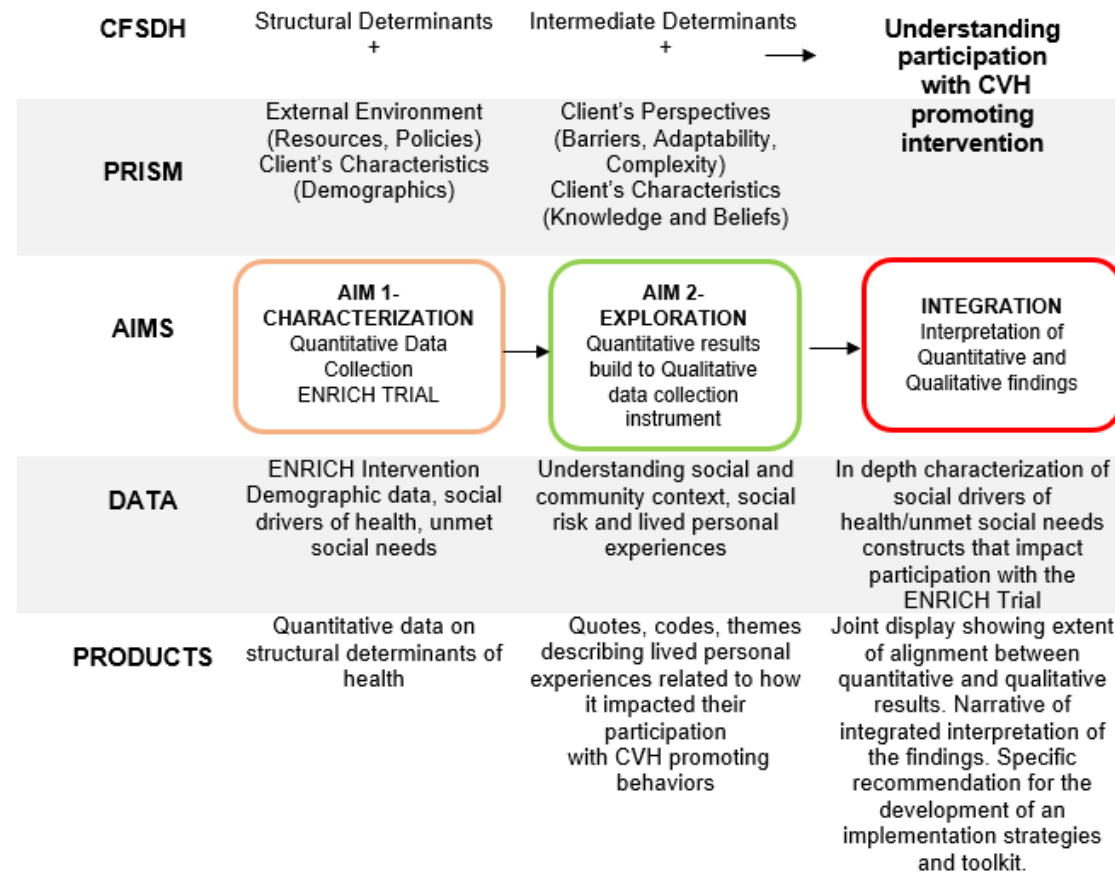
# Theoretical Underpinnings

## Practical, Robust implementation and Sustainability Model (PRISM)



Feldstein AC<sup>1</sup>, Glasgow RE. **A practical, robust implementation and sustainability model (PRISM) for integrating research findings into practice.** *It Comm J Qual Patient Saf.* 2008 Apr;34(4):228-43.

# Experimental Design + Methods



# Aim 1- Quantitative Data Collection

## Social Drivers of Health Drivers

- Food Insecurity: *Household Food Security Scale*
- Nutrition Security: *Nutrition Security Survey*
- Discriminatory Experiences: *Everyday Discrimination Scale*
- Childhood experiences: *Adverse childhood event*
- Socioecological Factors: *Social Vulnerability Index*

## Baseline survey variables

- Education
- Income
- Health insurance
- Living situation
- Household composition
- Marital status

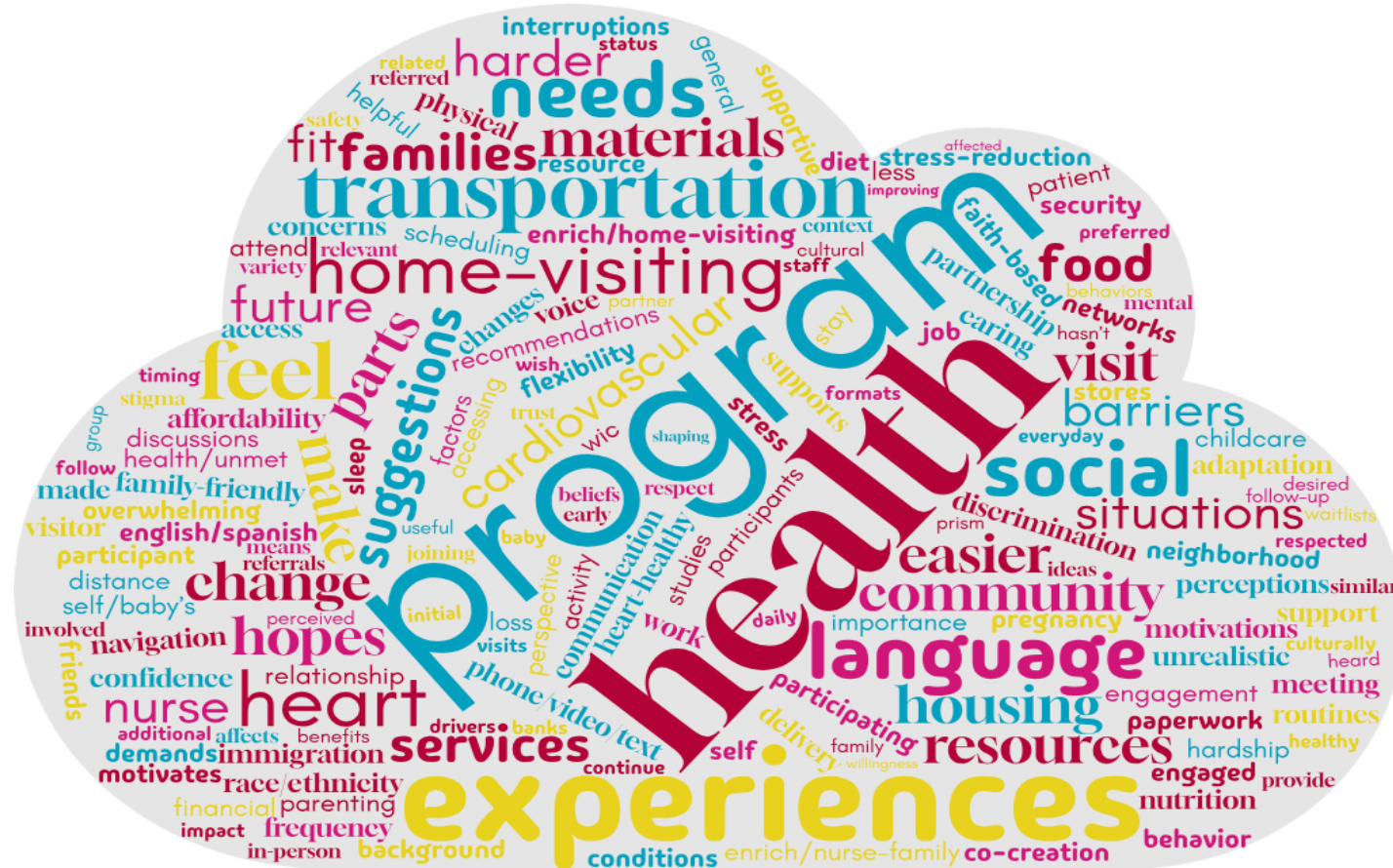


# Aim 2-Qualitative Data Collection

- Conduct semi-structured interviews
  - Participants who have been enrolled in ENRICH for over a year.
  - Participants who are  $\geq 18$
  - Either speak English or Spanish



## Aim 2-Qualitative Data Collection





# Next Steps

Dec 25

- Quantitative Data Analysis
- Interview guide development based on quantitative data

Jan 26

- Recruitment of interview participants
- Start collecting Qualitative Data
- Continue to refine Specific Aims Page for R01 Implementation Grant

May 26

- Qualitative Data Analysis

June  
26

- Submission of R01 Implementation Grant

# Thank you!

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303-724-1083



# Secondary Study Aims

- Evaluate if adults receiving ENRICHed HV, compared to those receiving usual HV, have differences in:
  - Primary outcomes at 24 months
  - A composite score of CVH using the American Heart Association's Life's Essential 8 (LE8)
  - Individual health behaviors and factors at 12 and 24 months postpartum (i.e., 281 MEPA diet quality score, time spent in moderate and vigorous physical activity, 282 sleep, tobacco use, BMI, BP, blood glucose, and blood lipids)
- Evaluate if children receiving ENRICHed HV, compared to those receiving usual HV, have differences in:
  - A composite score of CVH using modified LE8 scoring criteria for children to include sleep, diet, and physical activity/screen time at 24 months
  - Growth trajectories as measured using BMI z-scores over the first 24 months of age
- Assess implementation outcomes of ENRICH and the context in which ENRICH is implemented (*Implementation study*).

# ENRICH Training for Home Visitors



At your next visit, you check in on the SMART goal she created on page 3. She states she hasn't been able to make much progress with this goal and you perceive she is feeling discouraged about getting more active.

Let's pick up the scenario at this home visit and listen in on the conversation between Rachelle and the home visitor:

HV: It sounds like you are feeling a bit discouraged with your goal to do an online workout video.

Rachelle: Yeah, I've been feeling extra tired lately and I don't really have much time to do one.

HV: It sounds like you are having a hard time finding the energy to try something new and fit it in to your schedule.

Rachelle: Exactly. I know it's important to exercise but don't know what to do when I just want to sleep when I am not at work.

HV: Well, maybe we should start with something simpler. I noticed on page 3 of Getting Active During Pregnancy you checked "Walking the dog" as an activity you do regularly. Can you tell me more about that?

Rachelle: Oh yeah, I walk my roommate's dog before I head into work around noon, since my roommate works full time and I work part time. We usually just go around down the street and back.

HV: How is that for you?

Rachelle: Not bad... Peanut (the dog) is cute and I guess it's nice to get some fresh air before going to work inside for 4 hours.

1. What would you say next to continue this conversation with Rachelle?
2. What did the home visitor do to support Rachelle during this discussion?
3. What techniques (Motivational Interviewing, etc.) might you use to incorporate Rachelle's motivations and overcome barriers in support of her goal?
4. What would you do differently to discuss Rachelle's barriers and motivation for change?
5. Write an example of a SMART goal Rachelle may create at the end of this visit.