

Aligning Health and Social Systems to Expand Evidence-Based Home-Visiting

Strategies to Achieve Alignment, Collaboration, and Synergy Across Delivery and Financing Systems

Research-in-Progress Webinar
August 31, 2022
12-1pm ET

Welcome Glen Mays, PhD – Systems for Action

Panelists Venice Ng Williams, PhD, MPH
Greg Tung, PhD, MPH
Mandy Allison, MD, MSPH, MA
Daniel Olds, PhD

Q&A Carrington Lott, MPH – Systems for Action



Venice Ng Williams, PhD, MPH is an Assistant Professor of Pediatrics at the Prevention Research Center for Family & Child Health (PRC) located at the University of Colorado School of Medicine. Her research is focused on improving maternal-child health through systems integration, cross-sector collaboration, and strengthening the evidence-based of prevention programs like Nurse-Family Partnership. Dr. Williams has a broad background in public health and health services research, with specific training and expertise in program planning and evaluation, mixed methods research, causal inference, and survey research. She is passionate about improving maternal and child health by building on the strengths of families, addressing social determinants of health, and dismantling systems barriers and inequities that are critical to addressing the health of families experiencing adversity.

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Mandy Allison, MD, MSPH, MA is an Associate Professor of Pediatrics at the University of Colorado School of Medicine. Before medical school, she taught public school in Mississippi where she saw the effect of poor health on her students which led to her focus on pediatrics and preventive care. She currently sees patients and teaches residents and students at the Child Health Clinic at Children’s Hospital Colorado, serving a racially, culturally, and linguistically diverse, mainly low-income population. Dr. Allison has conducted immunization delivery, school health, and early childhood development research that has been funded by the NIH, CDC, AHRQ, and foundations. She joined the team at the Prevention Research Center for Child and Family Health (PRC) in 2016 and has led their research about serving mothers with previous live births and mothers with substance use disorder with Nurse-Family Partnership (NFP). Since June 2019, she has been the Co-Director of the PRC with Dr. David Olds, the founder of NFP.

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Greg Tung, PhD, MPH is an Associate Professor in the Colorado School of Public Health's Department of Health Systems, Management & Policy. His research interests relate to how scientific evidence is incorporated into policy and program decision making, with a special emphasis on injury prevention. Dr. Tung works on a diverse range of injury topics, including the prevention of youth violence, suicides, poisonings and child abuse. His research interests also include the integration of health services and public health systems, with a focus on non-profit hospital community benefit activities. Dr. Tung is a mixed methods researcher and utilizes both quantitative (e.g. longitudinal, multi-level, and time-to-event analysis) and qualitative (e.g. case studies) methods. He is also faculty in the Program for Injury Prevention, Education and Research (PIPER).

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David Olds, PhD is professor of Pediatrics, Psychiatry, Preventive Medicine and Nursing. He serves as director of Prevention Research Center for Family and Child Health at the University of Colorado Denver. He is interested in developing and testing interventions designed to improve maternal and child health early in the lives of children.

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PROJECT TEAM & COLLABORATORS

■ Principal Investigator and Co-Investigators

- Venice Ng Williams, PhD, MPH
- Greg Tung, PhD, MPH
- Mandy Allison, MD, MSPH, MA

■ Project team

- Mike Knudtson, MS
- Connie Lopez, BSN, RN, MA
- Carol Franco-Rowe, MA

■ Collaborators/Advisory Committee:

- David Olds, PhD
- Chris Arestides, BSN, RN, MPH
- Jade Woodard, MPA



Health Systems, Management & Policy
colorado school of public health

OUR PROJECT

- Study Purpose:
 - To examine the effects of *multi-sector financing and delivery strategies* in expanding the *reach and impact* of the Nurse-Family Partnership[®] (NFP) program across the United States using a *mixed-methods* approach

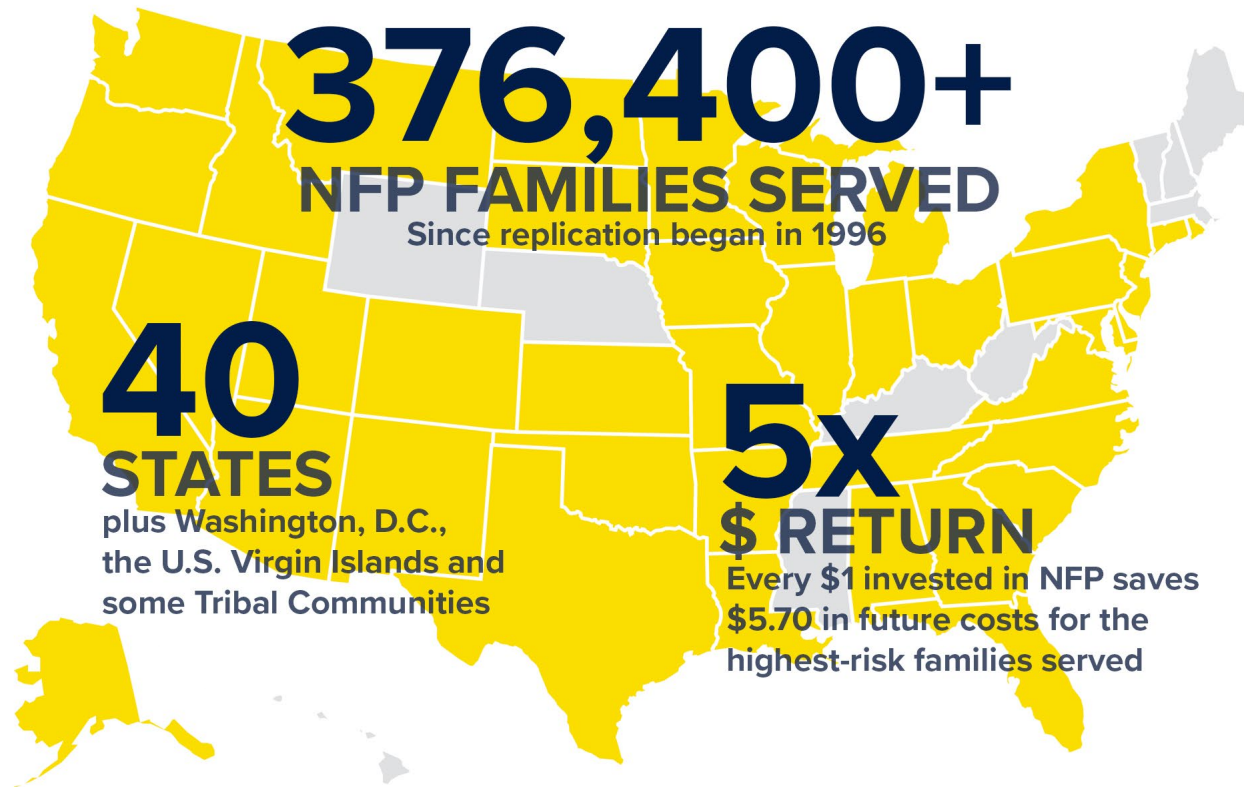


Nurse-Family Partnership

Helping First-Time Parents Succeed®



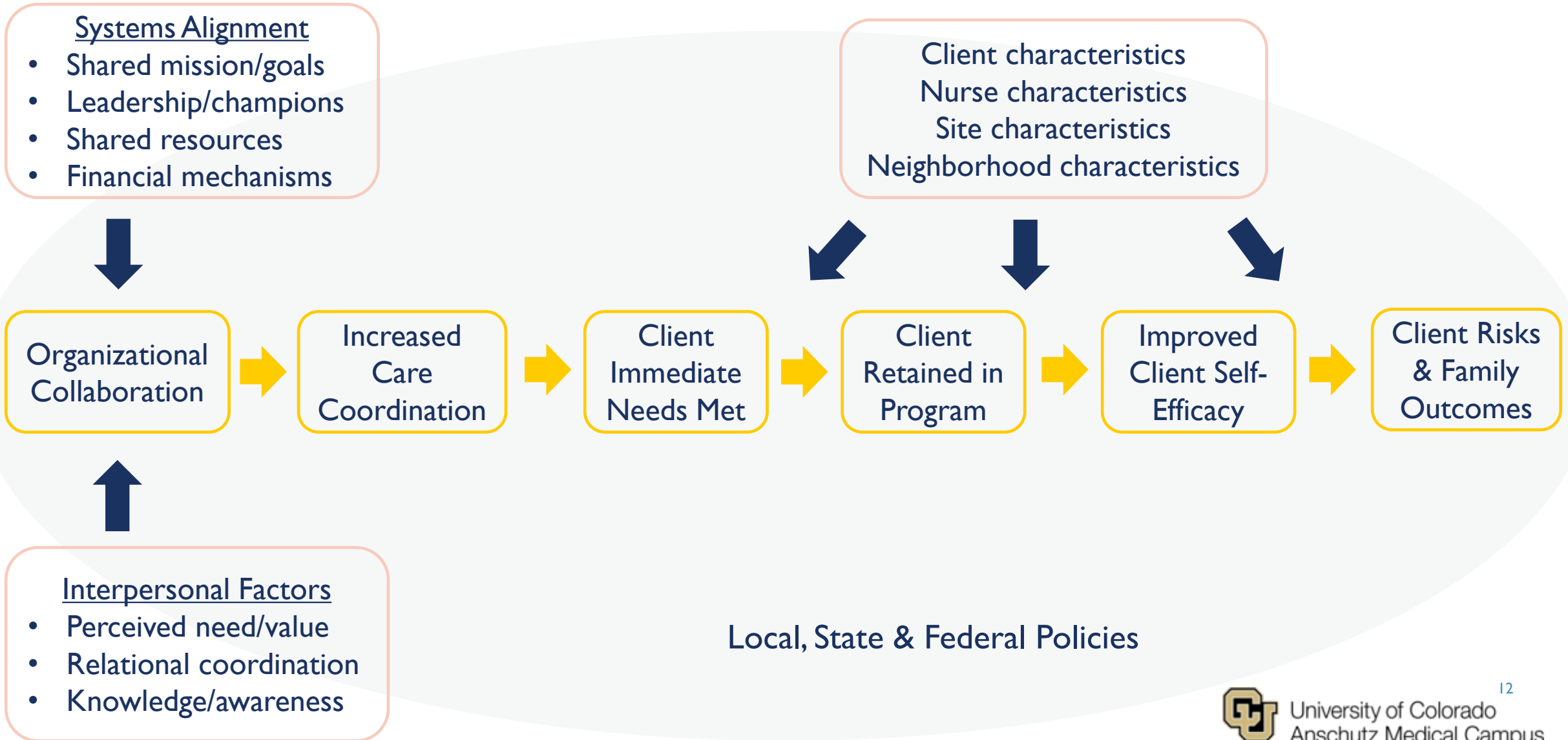
NURSE-FAMILY PARTNERSHIP® IS A COMMUNITY HEALTH PROGRAM THAT TRULY CHANGES LIVES – FOR GENERATIONS TO COME.



OUR PROJECT

- Aim 1. Assess degree of collaboration by site between NFP and cross-sector providers including healthcare systems and social services
- Aim 2. Estimate the relationship between site-level collaboration and program outcomes
- Aim 3. Identify and disseminate best practices of successful collaboration with health systems and social services

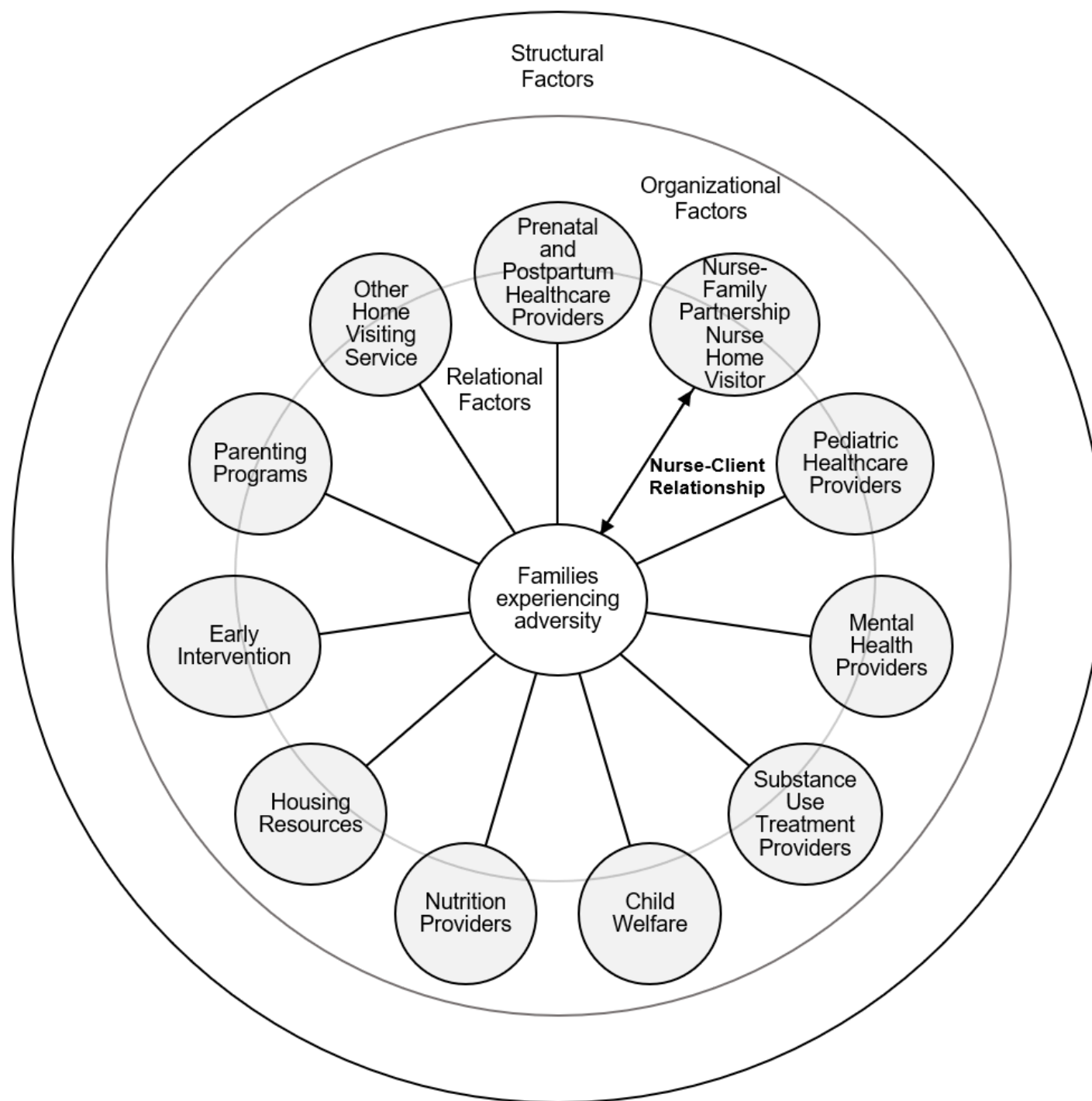
Conceptual Model/Theory of Change



AIM I: COLLABORATION CHANGES OVER TIME

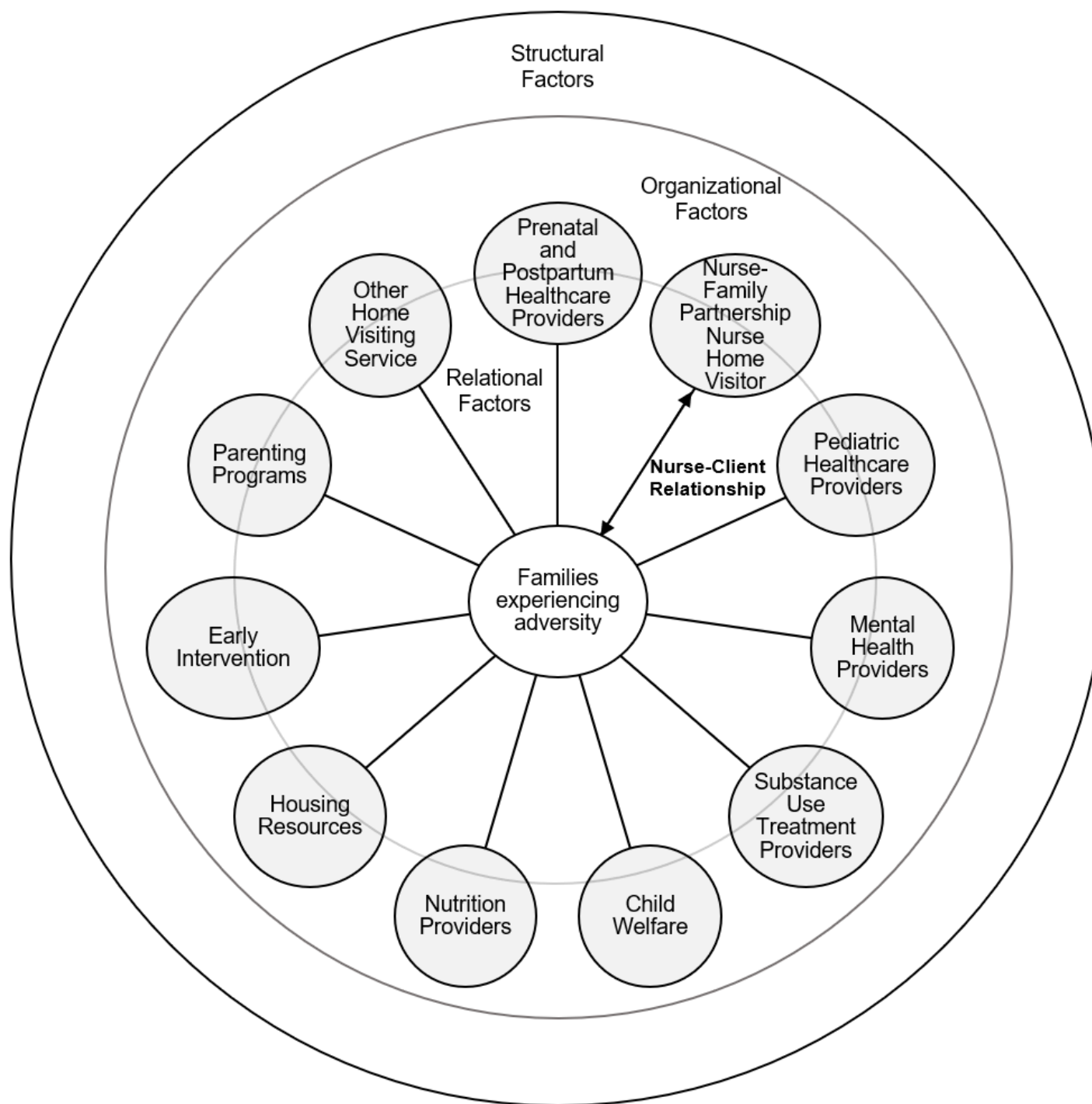
Research Question: *Has systems-level collaboration between NFP and other cross-sector providers changed in response to “naturally-occurring” efforts to facilitate enhanced collaboration?*

- Longitudinal survey methodology
- NFP nurse collaboration with other healthcare and social service providers
- Measures relational coordination and structural integration



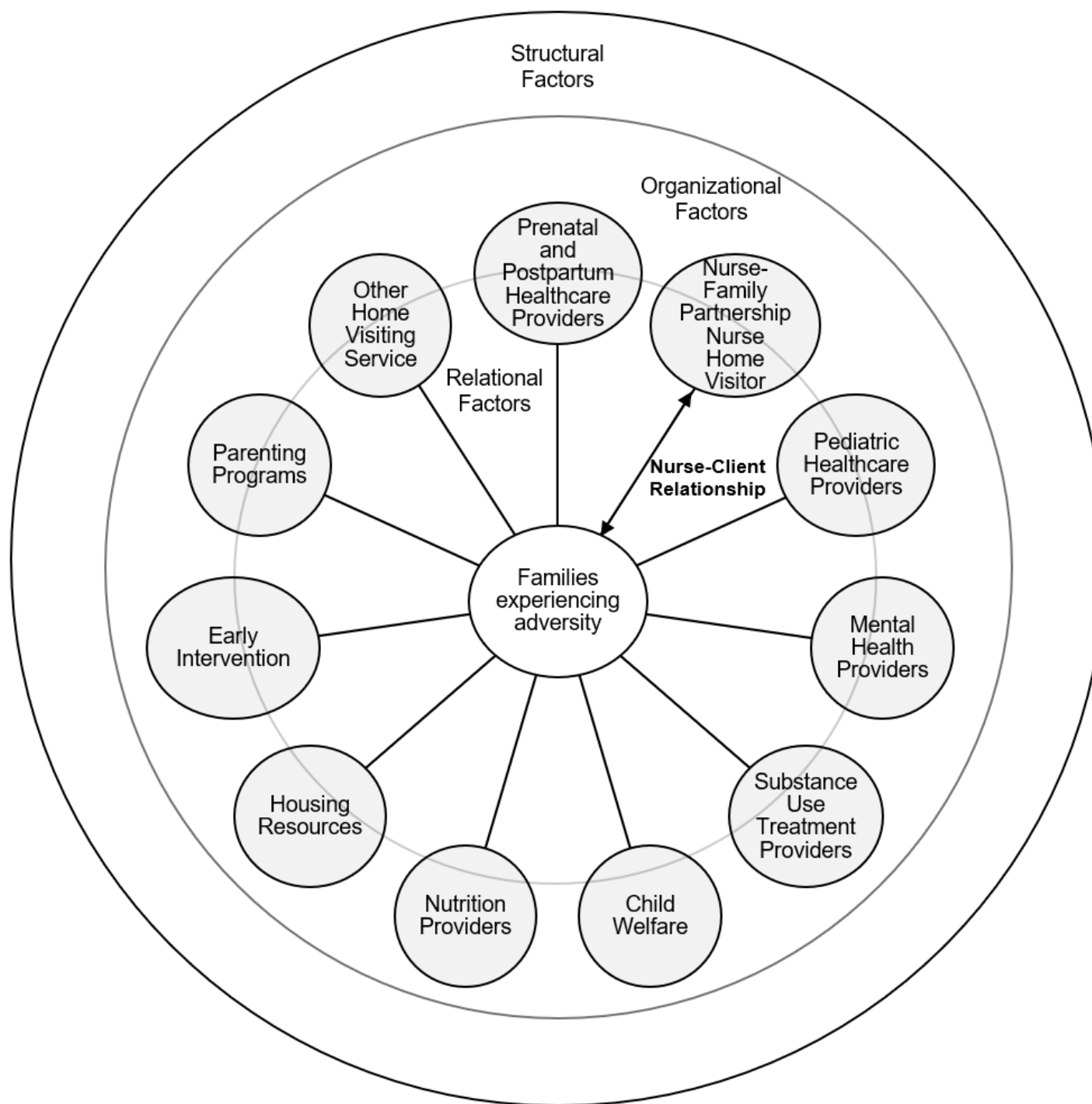
Relational Factors

High quality
communication +
High quality
relationships



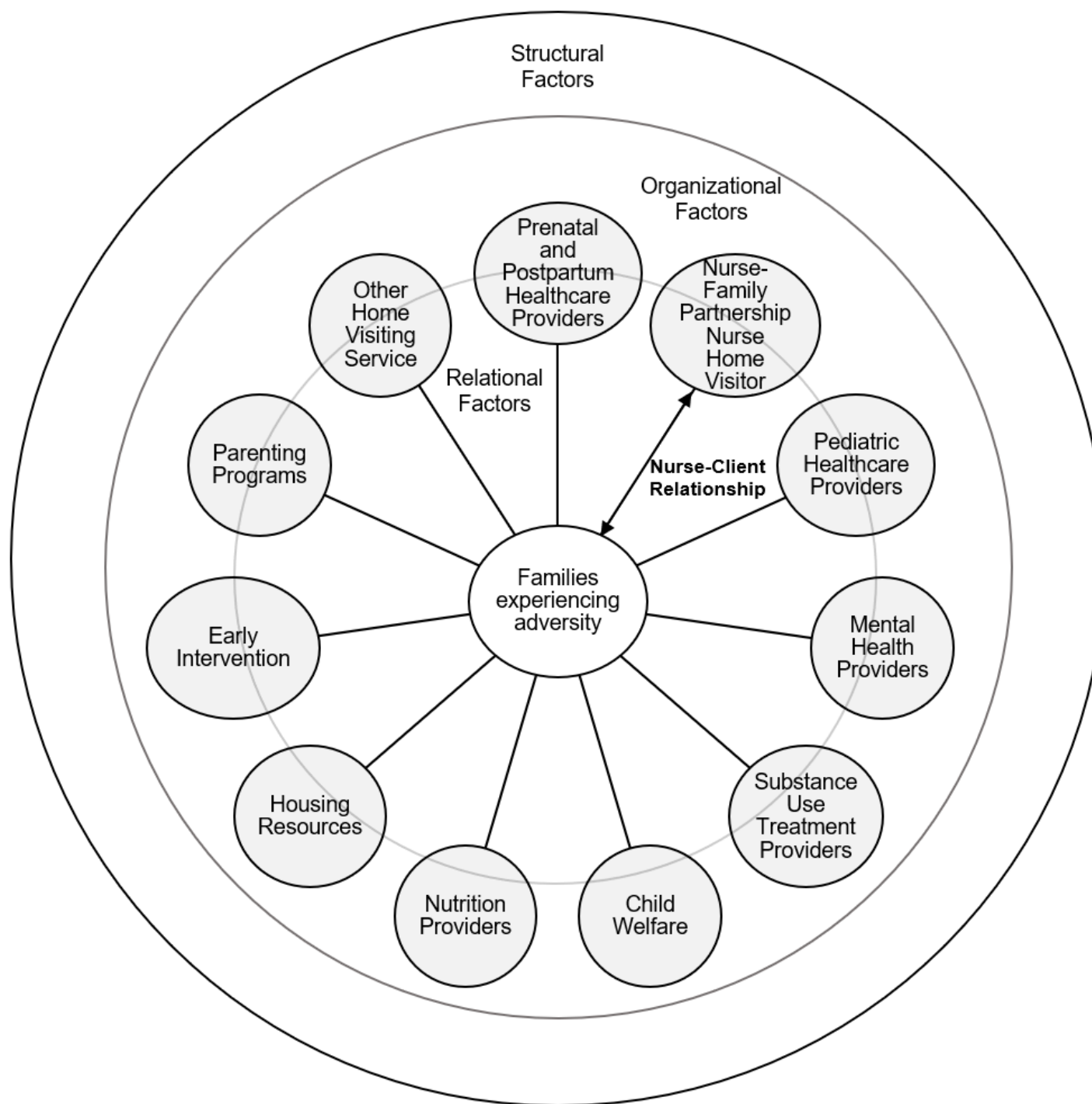
Relational Factors

High quality
communication +
High quality
relationships



Organizational Factors
Shared policies
Shared funding

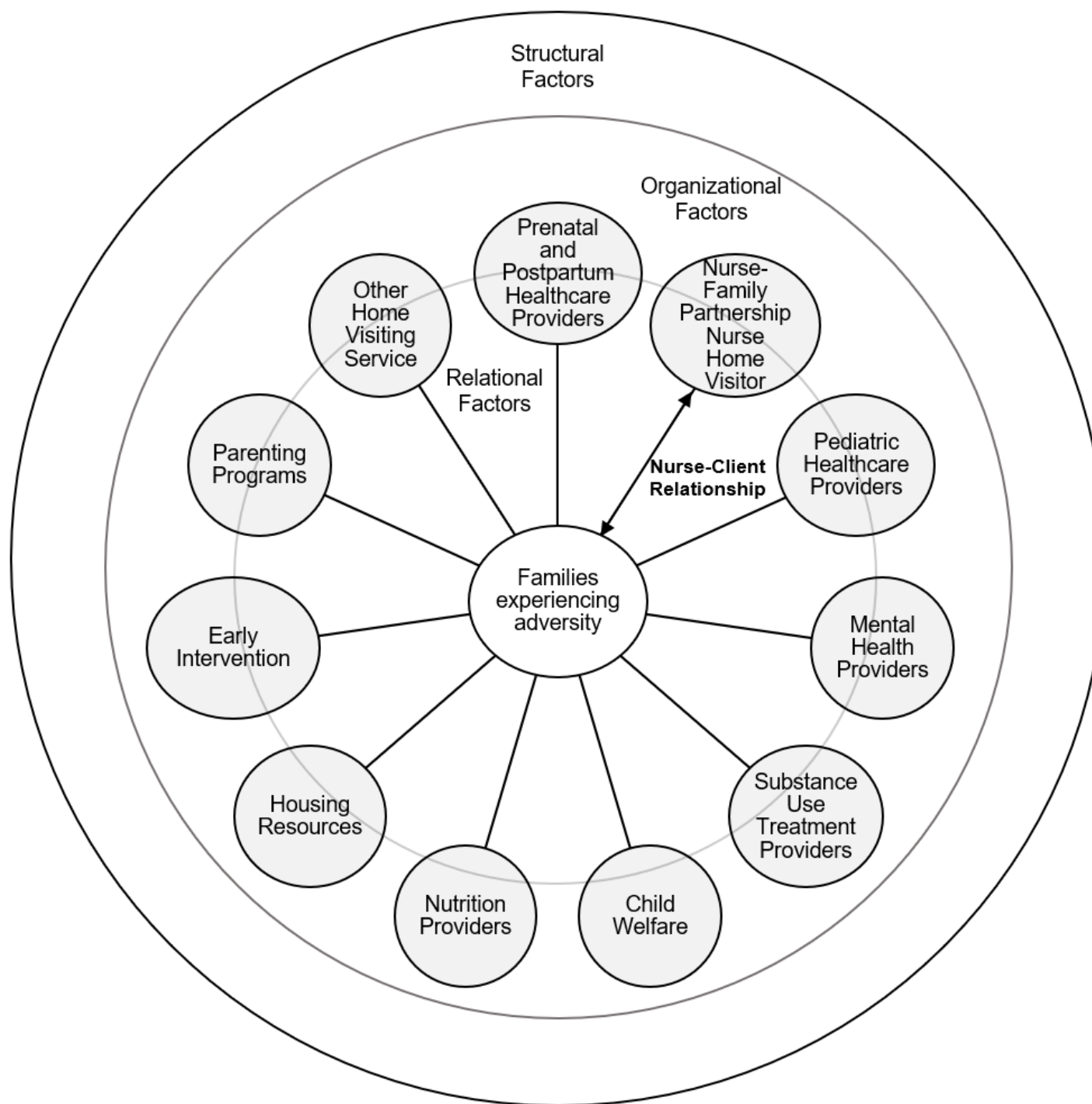
Relational Factors
High quality
communication +
High quality
relationships



Structural Factors
Shared space
Shared data

Organizational Factors
Shared policies
Shared funding

**RELATIONAL
COORDINATION**
measures Relational
Factors



**STRUCTURAL
INTEGRATION**
measures Structural
and Organizational
factors

COLLABORATION SURVEY

- Census of all NFP nursing supervisors from active NFP implementing sites in 2018 (RR=71%), 2020 (RR=85%) and 2021 (RR=74%)

	2018	2020	2021
Survey participants (n)	263	316	307
Nurse Supervisor (n, %)	250 (95%)	300 (95%)	285 (93%)
Other: Nurse Home Visitor, Administrator (n, %)	13 (5%)	16 (5%)	22 (7%)
Localities represented			
Teams (n)	257	301	298
Sites (n)	199	229	227
States and Territories (n)	39	39	42
Agency Type			
Public Health Department (n, %)	137 (52%)	162 (52%)	153 (50%)
Health System (n, %)	50 (19%)	70 (22%)	67 (21%)
Community-based organization (n, %)	68 (26%)	74 (23%)	76 (25%)
Other (n, %)	8 (4%)	10 (3%)	11 (4%)



OVERALL FINDINGS

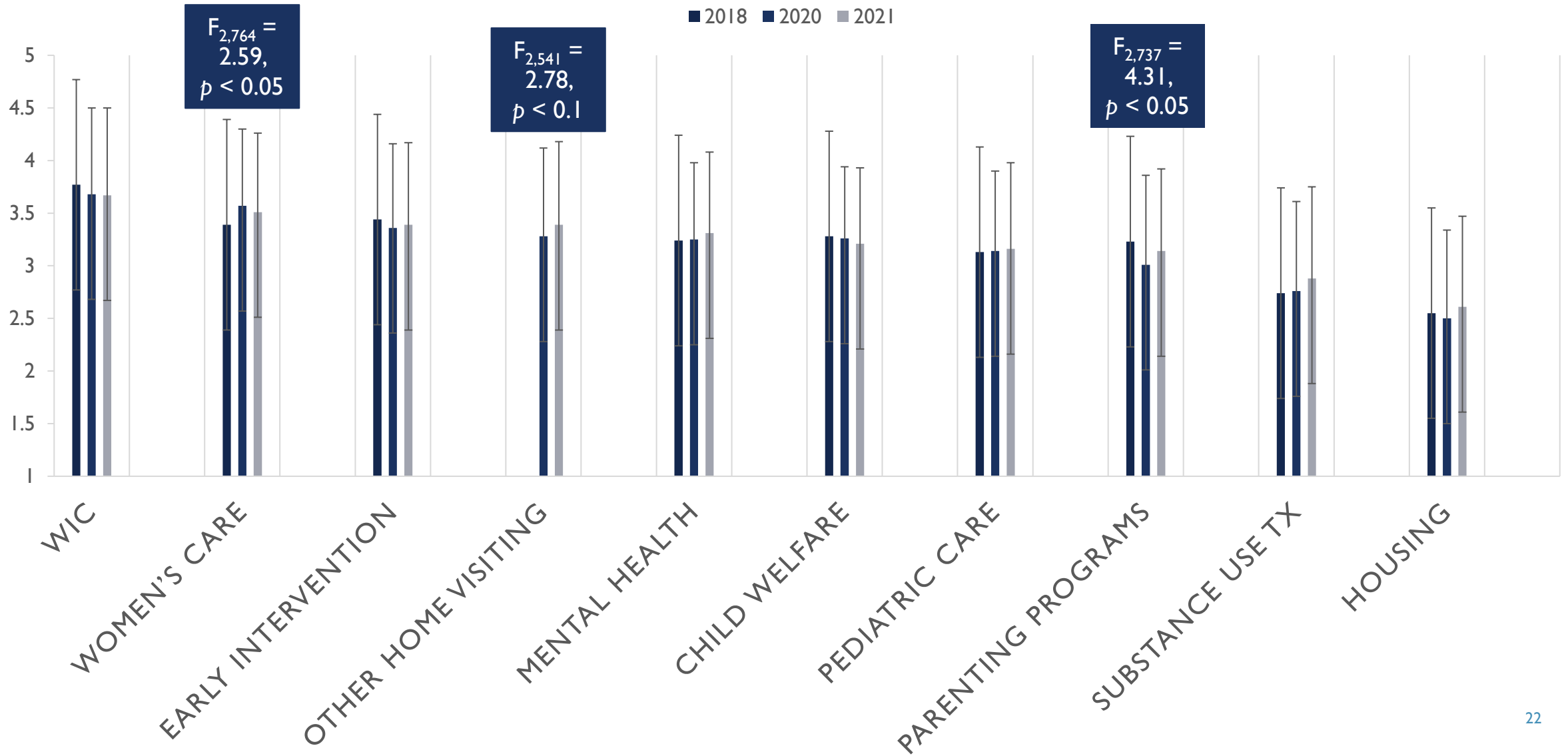
- **Moderate relational coordination** among all providers (M=3.21, M=3.21, M=3.23; $p>0.1$)
- **Highest coordination** with WIC and women's care
- **Lowest coordination** with substance use treatment providers and housing
- **Little shared resources** among all providers (Mean Sum=6.07, Mean Sum=6.02, Mean Sum=6.07; $p>0.1$)
- **Greatest integration** with other home visiting and WIC
- **Lowest integration** with substance use treatment providers and housing

COLLABORATION CHANGES OVER TIME

- **Improved coordination** with Women's Care
- **Decreased coordination** with Parenting Programs
- **Less integration** with Parenting Programs

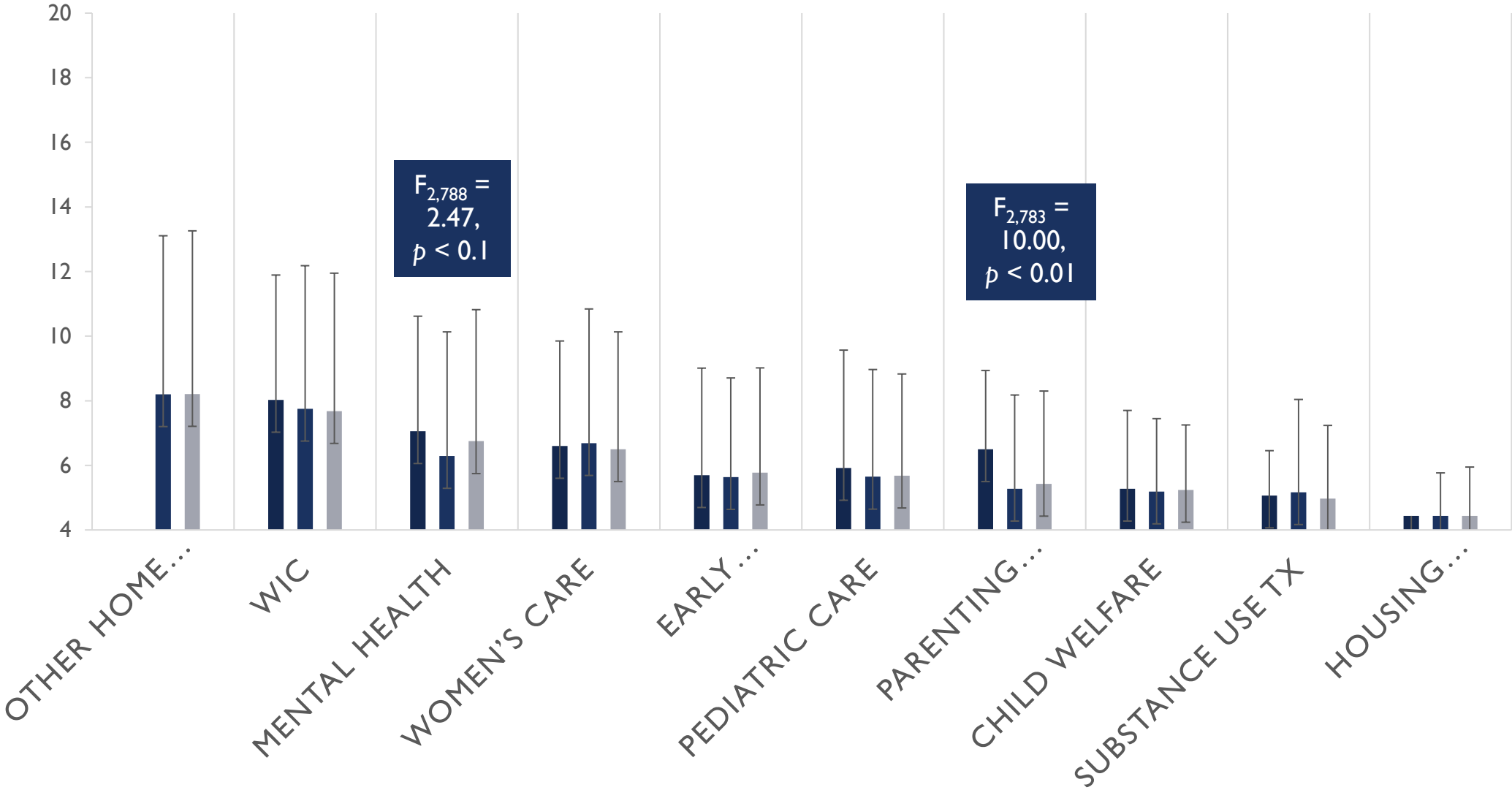


MEAN RELATIONAL COORDINATION SCORES BY YEAR



MEAN STRUCTURAL INTEGRATION SCORES BY YEAR

■ 2018 ■ 2020 ■ 2021

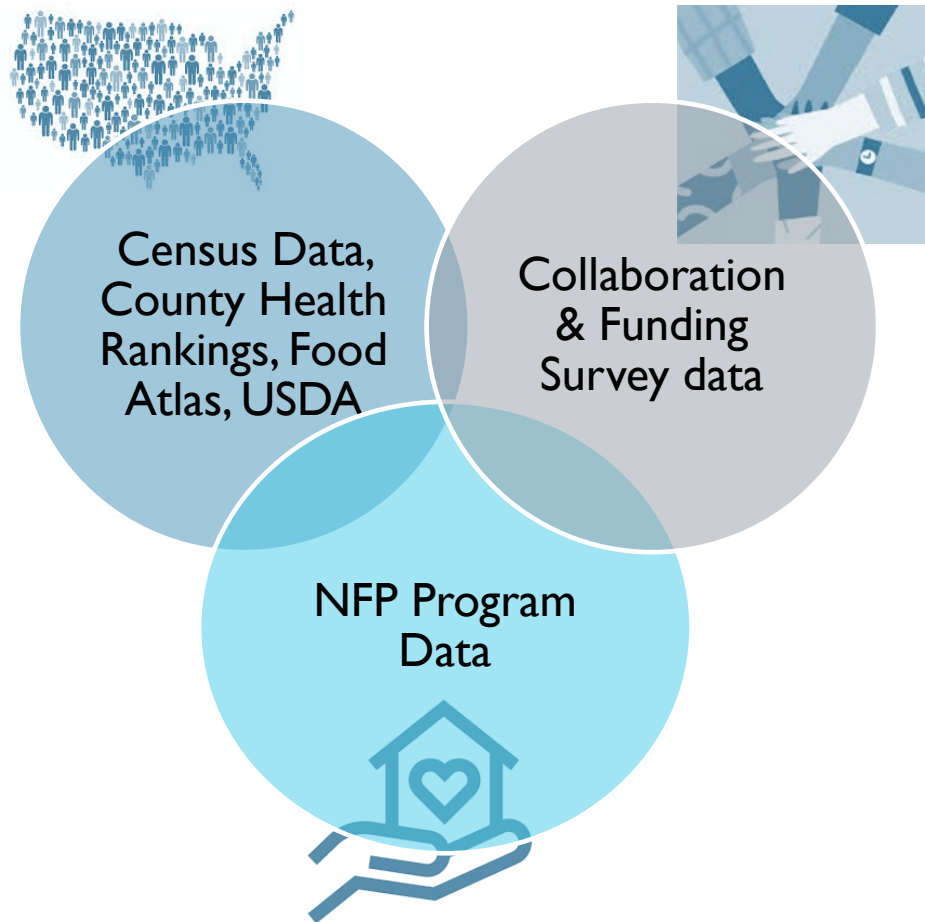


AIM 2: COLLABORATION & OUTCOMES

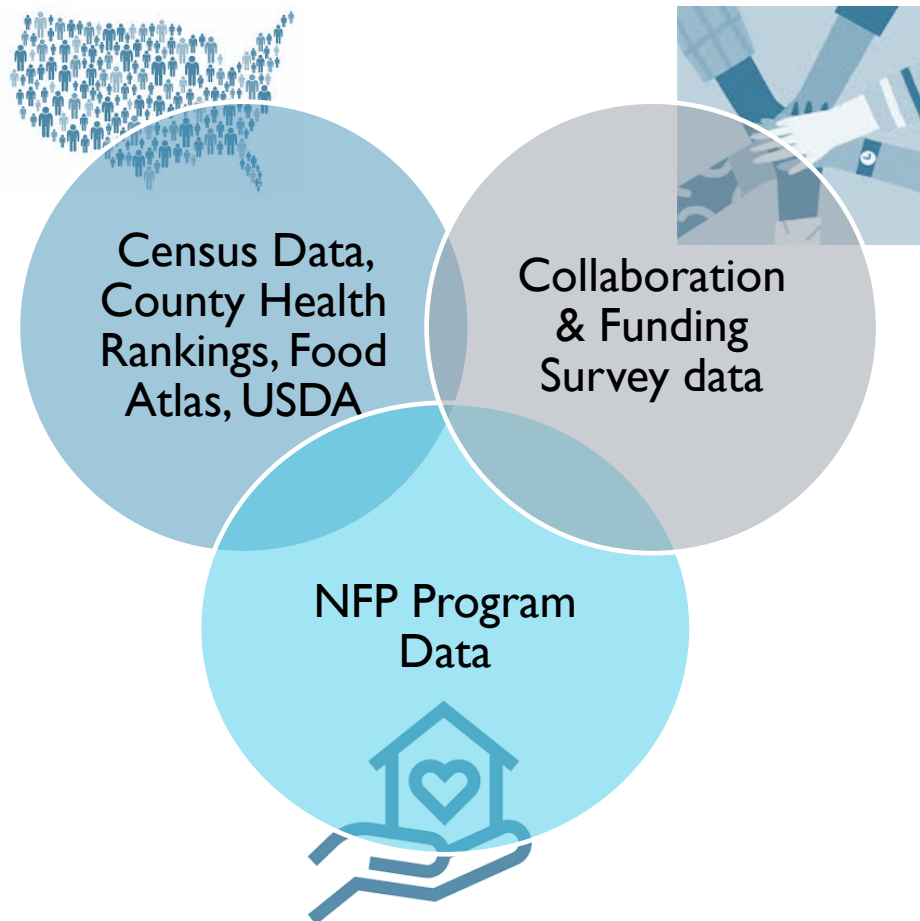
Research Question: ***What is the relationship between improved NFP-community provider collaboration and program outcomes?***

- Random effect (mixed) models with client-, nurse-, and site-level factors
- Compare healthcare-financed sites vs. social service-financed sites

DATA

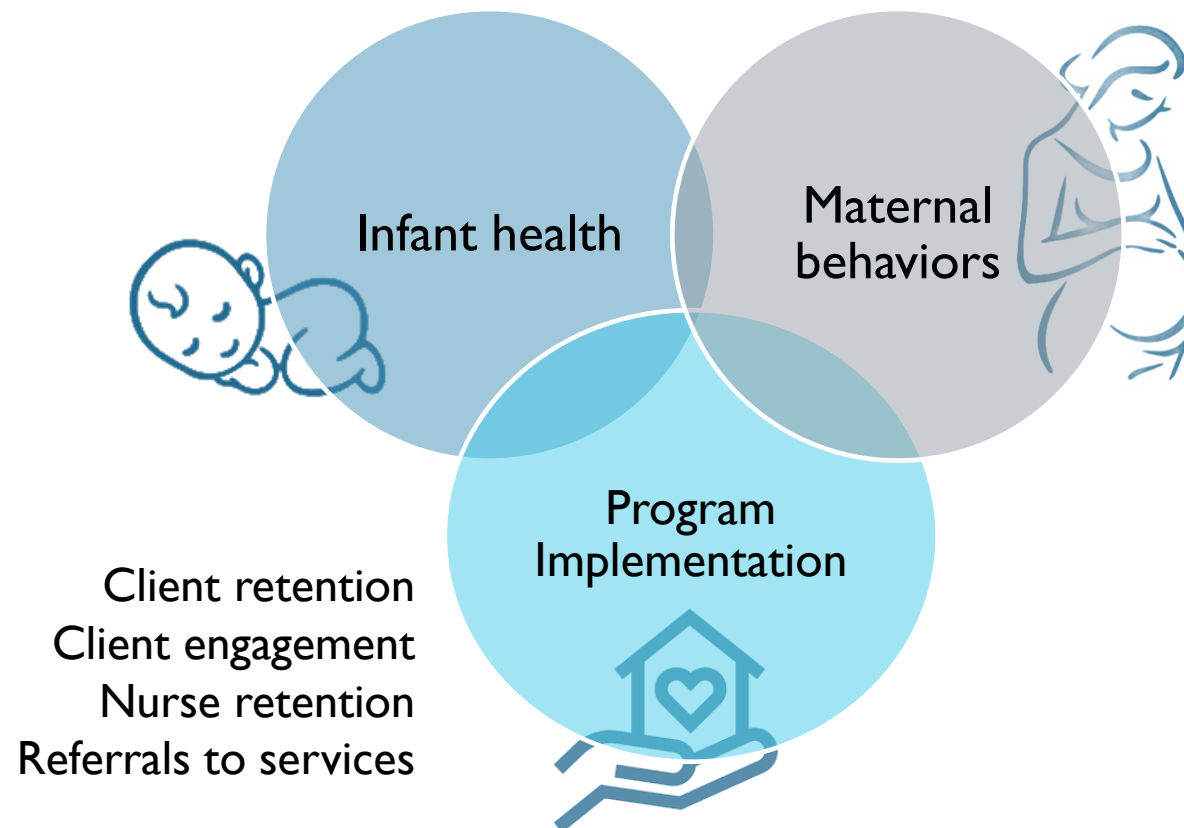


DATA

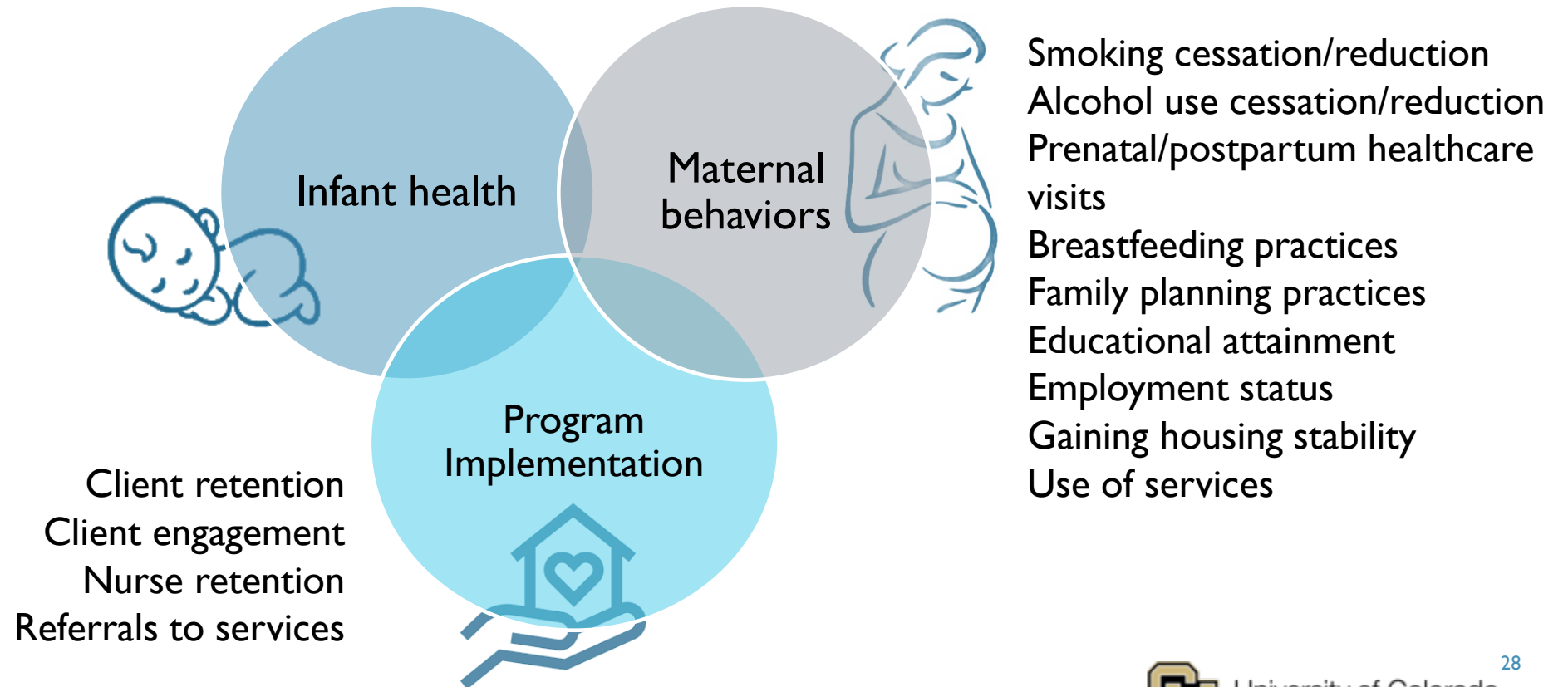


- NFP clients with their first visit between Jan 1, 2015 and Dec 31, 2021
- Clients matched to nurse who conducted first 4 home visits with that client
- Inclusion criteria: 4+ visits
- Exclusion criteria: ceased participation due to moving, miscarriage, lost custody, child death
- Covariates: client-, nurse-, site-, neighborhood-level

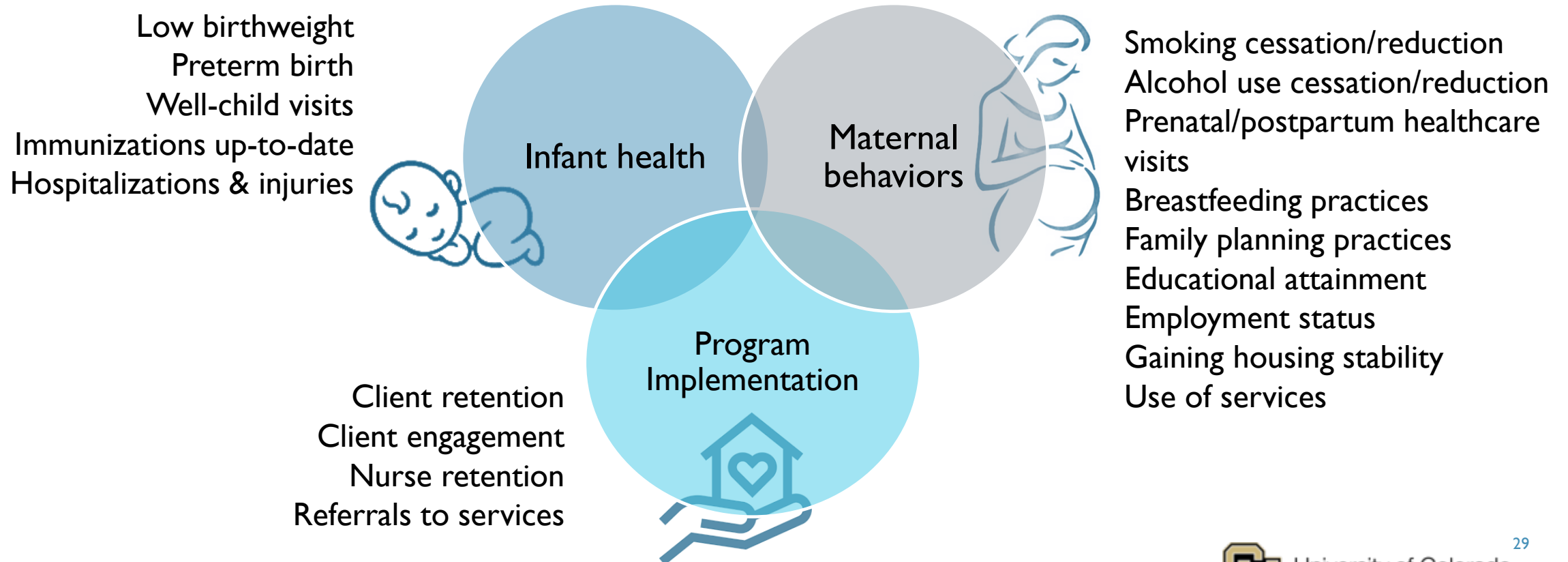
OUTCOMES



OUTCOMES

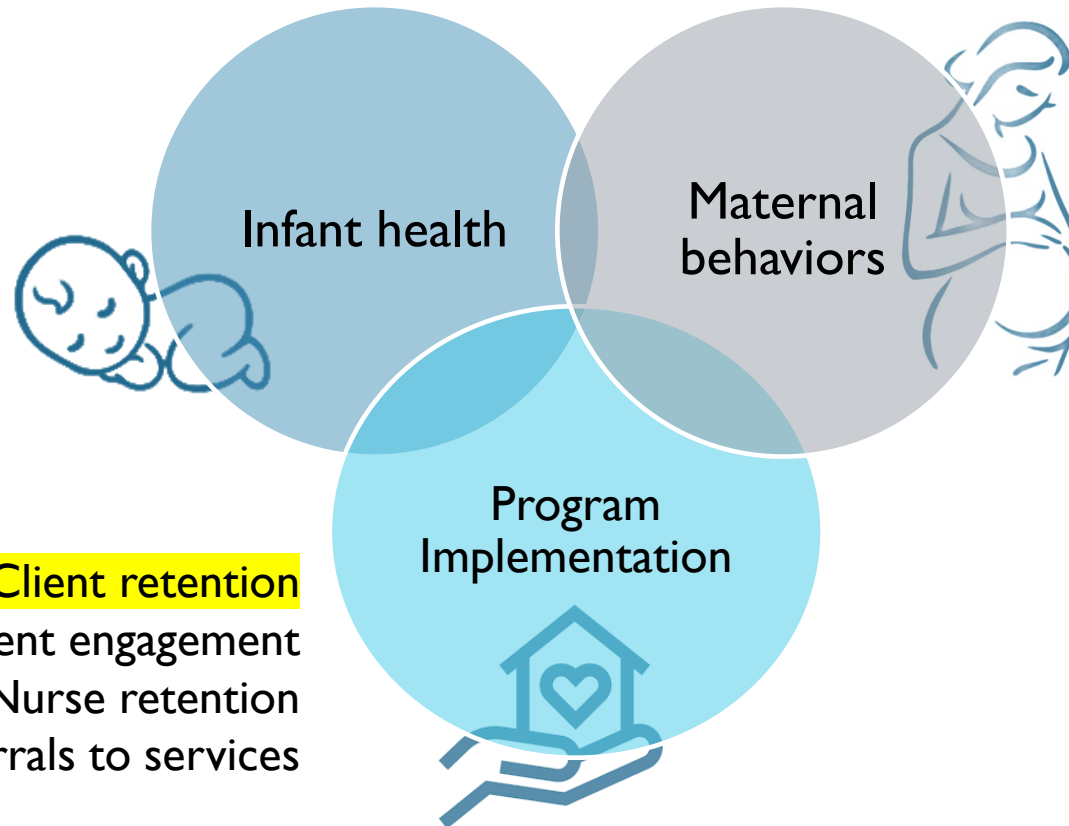


OUTCOMES



OUTCOMES

Low birthweight
Preterm birth
Well-child visits
Immunizations up-to-date
Hospitalizations & injuries



Client retention
Client engagement
Nurse retention
Referrals to services

Smoking cessation/reduction
Alcohol use cessation/reduction
Prenatal/postpartum healthcare visits
Breastfeeding practices
Family planning practices
Educational attainment
Employment status
Gaining housing stability
Use of services



Mixed associations with **client retention**

Positive associations with **breastfeeding at birth**

No relationship with **low birthweight, preterm birth, prenatal smoking cessation**

	Client retention at birth	Client retention at 12 mo	Client retention at 18 mo
	Adjusted Odds Ratio ^a	Adjusted Odds Ratio ^a	Adjusted Odds Ratio ^a
Relational Coordination with Obstetrics	1.009	-	-
with Pediatrics	-	1.041	1.053
with Mental health	1.019	1.051	1.082*
with Substance use treatment	1.009	0.952	0.935*
with Child Welfare	0.967	0.994	0.970
with WIC	0.935*	0.904***	0.909**
with Parenting	1.022	0.954	0.976
with Other home visiting services	0.969	0.995	0.974
with Housing	1.029	1.021	1.001
with Early intervention	1.015	1.036	1.064
Structural Integration with Obstetrics	0.999	-	-
with Pediatrics	-	0.991	0.991
with Mental health	0.995	1.000	0.998
with Substance use treatment	1.016	1.002	1.002
with Child Welfare	1.048***	1.040***	1.045***
with WIC	1.029***	1.030***	1.032***
with Parenting	0.997	1.012	1.01
with Other home visiting services	0.999	0.985***	0.984***
with Housing	1.009	1.014	1.015
with Early intervention	0.982**	0.972***	0.971***
Nurse-level variance	0.244	0.407	0.504
Intra-class correlation	0.07	0.11	0.13
Observations	108,314	93,703	86,601

*p<0.05, ** p<0.01, ***p<0.01

^a Adjusts for client sociodemographic and health, nurse sociodemographic and agency program factors

	Low birthweight Adjusted Odds Ratio ^a	Preterm birth Adjusted Odds Ratio ^a
Relational Coordination with Obstetrics	1.012	0.994
with Pediatrics	-	-
with Mental health	1.025	1.002
with Substance use treatment	0.994	0.996
with WIC	0.992	1.041
with Parenting	0.996	0.961
with Other home visiting services	1.014	1.046
with Early intervention	-	-
Structural Integration with Obstetrics	1.005	0.994
with Pediatrics	-	-
with Mental health	0.996	0.997
with Substance use treatment	1.007	1.013
with WIC	0.997	0.994
with Parenting	1.004	0.997
with Other home visiting services	1.000	1.001
with Early intervention	-	-
Nurse-level variance	0.011	0.008
Intra-class correlation	0.00	0.00
Observations	79,456	93,514

*p<0.05, ** p<0.01, ***p<0.01
^a Adjusts for client sociodemographic and health, nurse sociodemographic and agency program factors

	Low birthweight Adjusted Odds Ratio ^a	Preterm birth Adjusted Odds Ratio ^a	Prenatal Smoking Cessation Adjusted Odds Ratio ^a
Relational Coordination with			
Obstetrics	1.012	0.994	0.977
with Pediatrics	-	-	-
with Mental health	1.025	1.002	0.954
with Substance use treatment	0.994	0.996	1.081
with WIC	0.992	1.041	1.020
with Parenting	0.996	0.961	1.052
with Other home visiting services	1.014	1.046	0.838*
with Early intervention	-	-	-
Structural Integration with			
Obstetrics	1.005	0.994	1.007
with Pediatrics	-	-	-
with Mental health	0.996	0.997	1.031
with Substance use treatment	1.007	1.013	0.970
with WIC	0.997	0.994	0.977
with Parenting	1.004	0.997	0.986
with Other home visiting services	1.000	1.001	1.011
with Early intervention	-	-	-
Nurse-level variance	0.011	0.008	0.130
Intra-class correlation	0.00	0.00	0.04
Observations	79,456	93,514	4,579

*p<0.05, ** p<0.01, ***p<0.01

^a Adjusts for client sociodemographic and health, nurse sociodemographic and agency program factors

	Low birthweight Adjusted Odds Ratio ^a	Preterm birth Adjusted Odds Ratio ^a	Prenatal Smoking Cessation Adjusted Odds Ratio ^a	Breastfeeding (BF) at birth Adjusted Odds Ratio ^a	Continued BF at 12 mo Adjusted Odds Ratio ^a
Relational Coordination with Obstetrics	1.012	0.994	0.977	1.041	-
with Pediatrics	-	-	-	-	1.071
with Mental health	1.025	1.002	0.954	1.009	0.988
with Substance use treatment	0.994	0.996	1.081	0.983	0.996
with WIC	0.992	1.041	1.020	0.969	0.992
with Parenting	0.996	0.961	1.052	0.990	0.730***
with Other home visiting services	1.014	1.046	0.838*	1.025	1.228*
with Early intervention	-	-	-	-	1.054
Structural Integration with Obstetrics	1.005	0.994	1.007	0.992	-
with Pediatrics	-	-	-	-	1.019
with Mental health	0.996	0.997	1.031	1.011*	1.030
with Substance use treatment	1.007	1.013	0.970	0.989	0.963
with WIC	0.997	0.994	0.977	1.011*	0.986
with Parenting	1.004	0.997	0.986	1.008	1.047*
with Other home visiting services	1.000	1.001	1.011	0.995	0.973*
with Early intervention	-	-	-	-	0.981
Nurse-level variance	0.011	0.008	0.130	0.174	1.169
Intra-class correlation	0.00	0.00	0.04	0.05	0.05
Observations	79,456	93,514	4,579	104,338	13,681

*p<0.05, ** p<0.01, ***p<0.01

^a Adjusts for client sociodemographic and health, nurse sociodemographic and agency program factors

	Client retention at birth Adjusted Odds Ratio ^a	Client retention at 12 mo Adjusted Odds Ratio ^a	Low birthweight Adjusted Odds Ratio ^a	Preterm birth Adjusted Odds Ratio ^a	Prenatal smoking cessation Adjusted Odds Ratio ^a	Breastfeeding (BF) at birth Adjusted Odds Ratio ^a	Continued BF at 12 mo Adjusted Odds Ratio ^a
Primary Funding Source: Public health	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Health care	0.976	0.825**	0.938	0.988	1.294	1.084	1.438
Social services	1.082	0.998	0.886	0.880	0.887	0.867	1.228
Mixed	1.062	1.154***	0.960	0.983	0.984	1.053	1.318*
Unknown	0.967	0.910	1.054	1.090	1.007	1.073	0.947
# Funding Sources: I	Ref	Ref	Ref	Ref	-	Ref	Ref
2	0.980	0.976	0.972	0.945	-	1.139**	1.329
3	0.919	1.004	0.949	0.932	-	1.056	1.186
4	0.959	1.041	0.966	1.011	-	1.024	1.022
5+	1.127*	1.102	0.963	0.949	-	1.244***	1.401
Unknown							
Agency Type: Government	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Health care	1.325***	1.484***	0.999	1.02	0.831	0.926	0.932
CBO	1.009	1.051	1.017	0.945	0.665***	0.966	1.127
Education	1.380***	1.552***	1.101	0.872	0.767	0.994	2.587**
Nurse-level variance	0.244	0.407	0.011	0.008	0.130	0.174	1.169
Intra-class correlation	0.07	0.11	0.00	0.00	0.04	0.05	0.05
Observations	108,314	93,703	79,456	93,514	4,579	104,338	13,681

*p<0.05, ** p<0.01, ***p<0.01
^a Adjusts for client sociodemographic and health, nurse sociodemographic and agency program factors

DISCUSSION

Collaboration matters but not for all outcomes

- **Positive associations** between integration with CPS and WIC and client retention
- **Negative association** between coordination with WIC and client retention
- **Negative associations** between integration with other home visiting and early intervention and client retention
- **Agency type** plays a role in client retention, prenatal smoking cessation & continued breastfeeding
- Collaboration may be **less important** for prenatal/birth outcomes
- Better **integration with mental health and WIC** may support initiation of breastfeeding
- **Next steps:** sub-analyses by agency type, client race/ethnicity, funding sector



AIM 3: BEST PRACTICE MODELS

Research Questions: *Which highly collaborative NFP sites are the top performers based on identified program outcomes in Aim 2?*

What are the best practices, activities, and dynamics to collaboration among high-performing NFP sites?

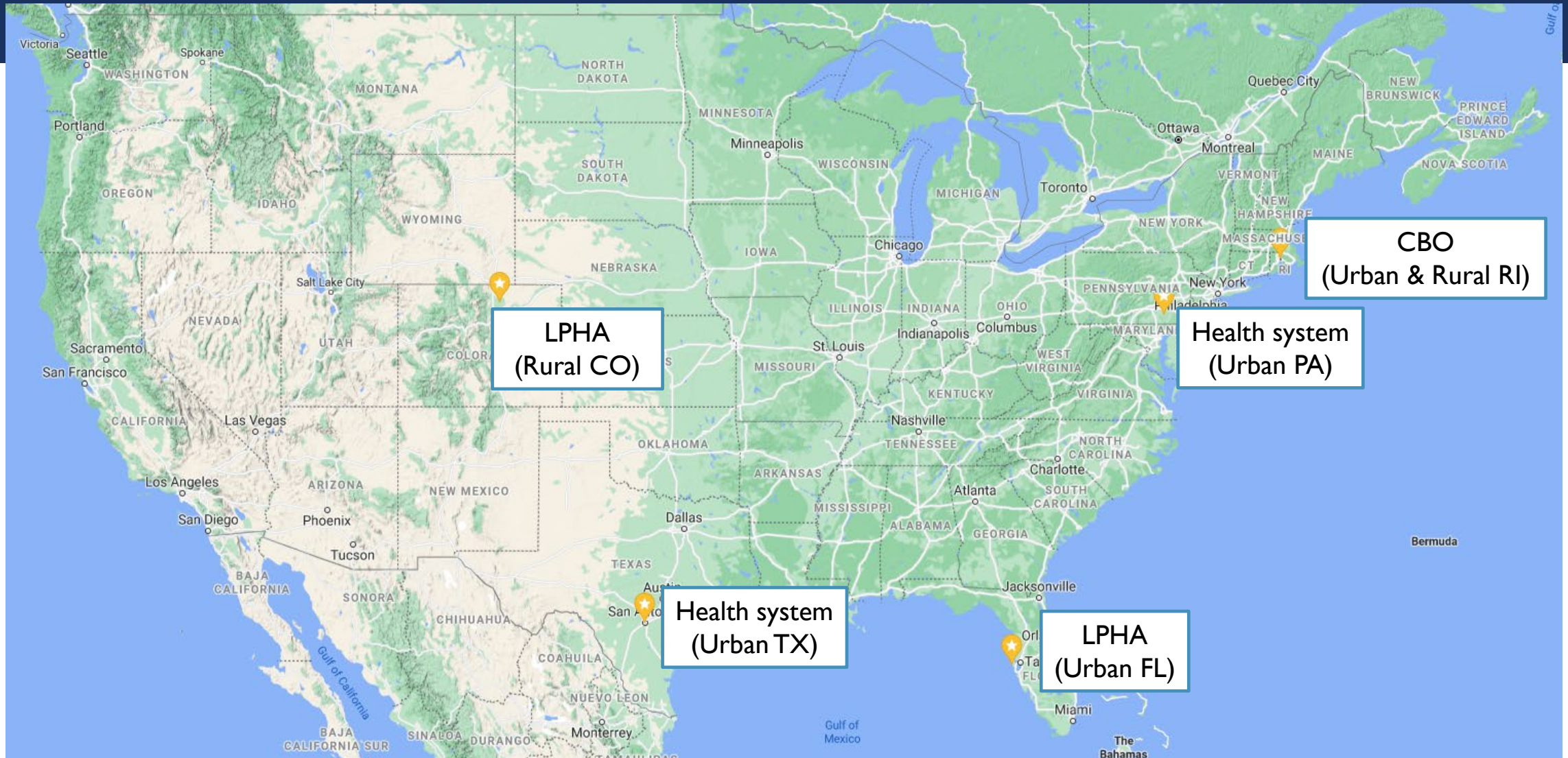
- Positive deviance approach to identify high-performers
- Conduct qualitative case studies
- Create best practice models of collaboration (including financing mechanisms)

SITE SELECTION

High performing sites have at least two of the following factors:

- Scoring 95 percentile in:
 - Coordination with substance use treatment providers;
 - Coordination with child welfare;
 - Coordination with WIC;
 - Integration with women's/pediatrics care; and/or
 - Integration with child welfare
- Above national average for client retention

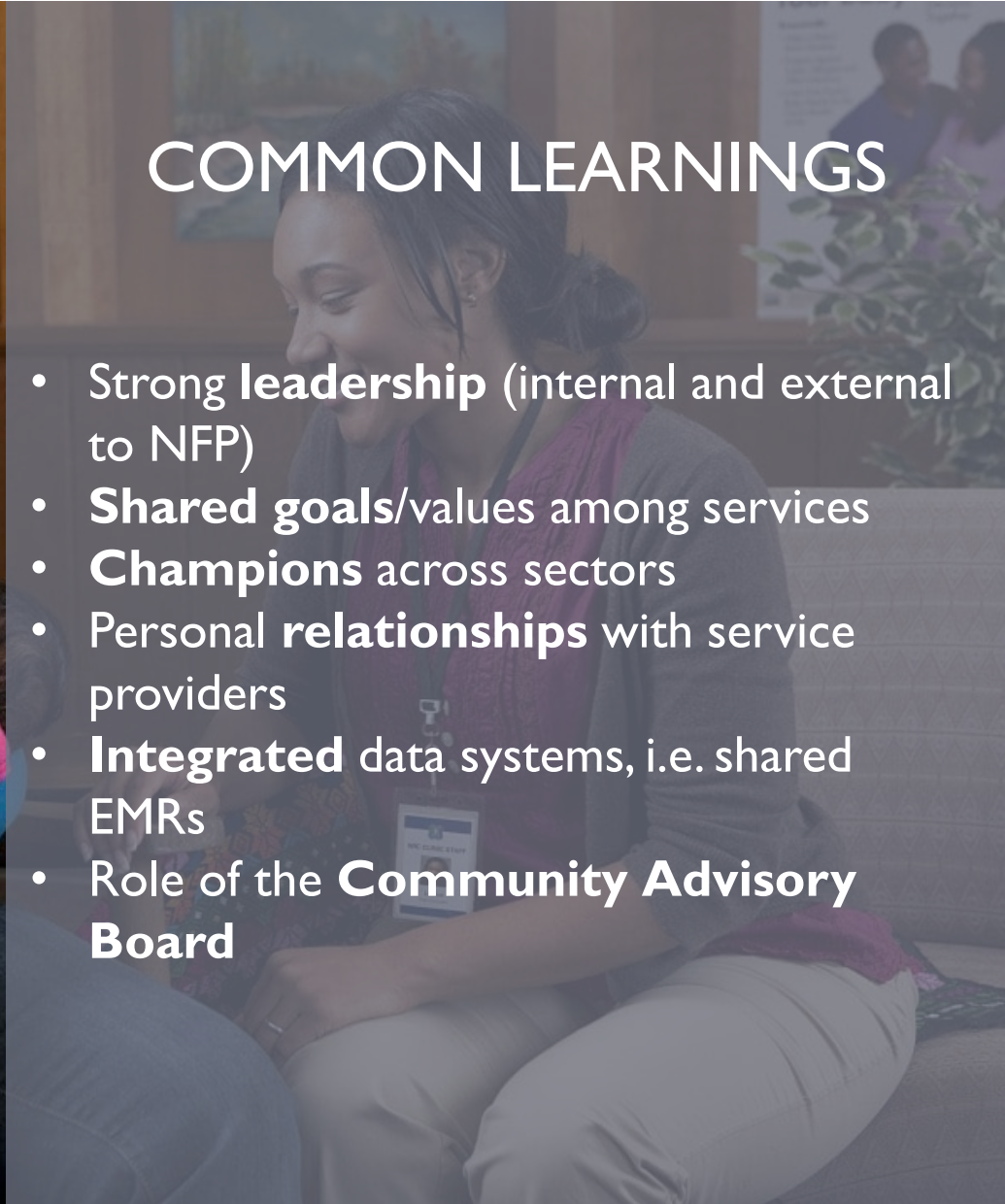
FIVE CASE STUDIES





COMMON LEARNINGS

- Strong **leadership** (internal and external to NFP)
- **Shared goals/values** among services
- **Champions** across sectors
- Personal **relationships** with service providers
- **Integrated** data systems, i.e. shared EMRs
- Role of the **Community Advisory Board**



COMMENTARY



QUESTIONS?

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Mandy Allison, MD, MSPH, MEd
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New S4A Funding Opportunity

- Thursday, **9/1**: 2-3pm ET
- Thursday, **9/8**: 2-3pm ET
- Thursday, **9/15**: 2-3pm ET
- Wednesday, **9/21**: 2-3pm ET
- Monday, **9/26**: 2-3pm ET

<https://tinyurl.com/CFPOfficeHour>

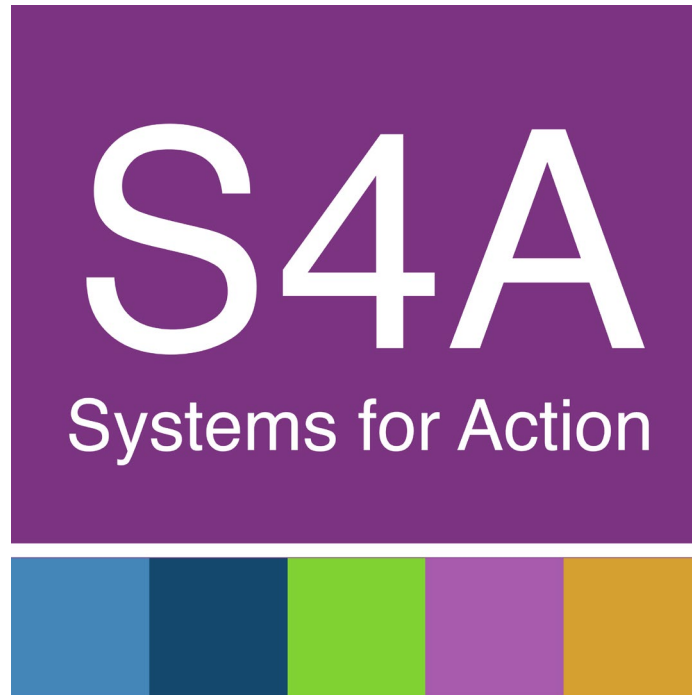
2022 Call for Proposals Virtual Office Hours

Drop in to ask S4A staff
your CFP questions!



\$2.5 million is available for designing and implementing a study that either pilot-tests an innovative systems alignment approach or evaluates the impact of the systems alignment approach on structural and systemic racism and health equity.

Learn more: <http://systemsforaction.org/funding-opportunities-2022>



www.systemsforaction.org

 [@Systems4Action](https://twitter.com/Systems4Action)

Acknowledgements

Systems for Action is a National Program Office of the Robert Wood Johnson Foundation and a collaborative effort of the Colorado School of Public Health, administered by the University of Colorado Anschutz Medical Campus, Aurora, CO.



Robert Wood Johnson
Foundation

colorado school of
public health