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 4, 2021
12-1pm ET

Agenda

Welcome   Carrington Lott, MPH – Systems for Action

Panelists   Venice Ng Williams, PhD, MPH

Greg Tung, PhD, MPH

Mandy Allison, MD, MSPH, MA

Jade Woodard, MPA, BSW

Q&A

S4A
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.

Contact info: VENICE.WILLIAMS@CUANSCHUTZ.EDU

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.

Contact info: mandy.allison@childrenscolorado.org

Panelists

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).

Contact info: gregory.tung@cuanschutz.edu

Jade Woodard, MPA, BSW has served as the Executive Director of Illuminate Colorado since its inception in 2015, following 7 years as the Executive Director of founding partner agency, the Colorado Alliance for Drug Endangered Children. Prior to this work, she provided family support services to families impacted by homelessness, domestic violence, and substance use disorders. As the Executive Director of Illuminate Colorado, she has participated in and led many state level initiatives related to child maltreatment, substance use, child maltreatment prevention, public awareness, and collaborative community approaches - including the Colorado Partnership for Thriving Families, Substance Exposed Newborns Steering Committee, Delivery of Child Welfare Services Task Force, Home Visitation Investment Task Force, Essentials for Childhood Steering Committee, and many others.

Contact info: jwoodard@illuminatecolorado.org

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, MA

- Collaborators/Advisory Committee:
  - David Olds, PhD
  - Chris Arestides, BSN, RN, MPH
  - Jade Woodard, MPA

illuminate
Building Brighter Childhoods

Nurse-Family Partnership
Helping First-Time Parents Succeed®

CU Department of Pediatrics
SCHOOL OF MEDICINE
UNIVERSITY OF COLORADO **ANSCHUTZ MEDICAL CAMPUS**

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
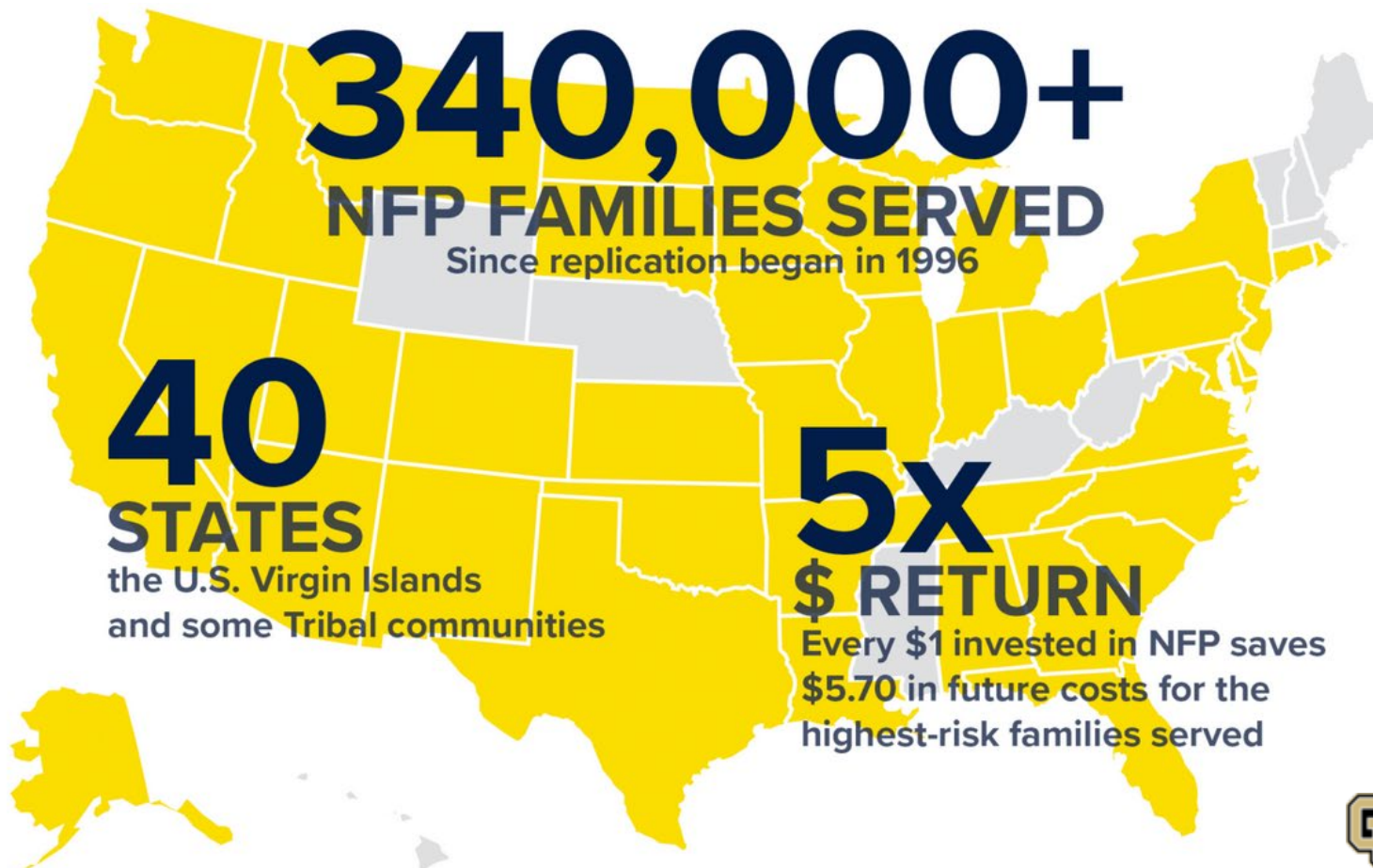
University of Colorado
Anschutz Medical Campus

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

340,000+
NFP FAMILIES SERVED
Since replication began in 1996

40 STATES
the U.S. Virgin Islands and some Tribal communities

5x $ RETURN
Every $1 invested in NFP saves $5.70 in future costs for the highest-risk families served

University of Colorado Anschutz Medical Campus

https://www.nursefamilypartnership.org/about/

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
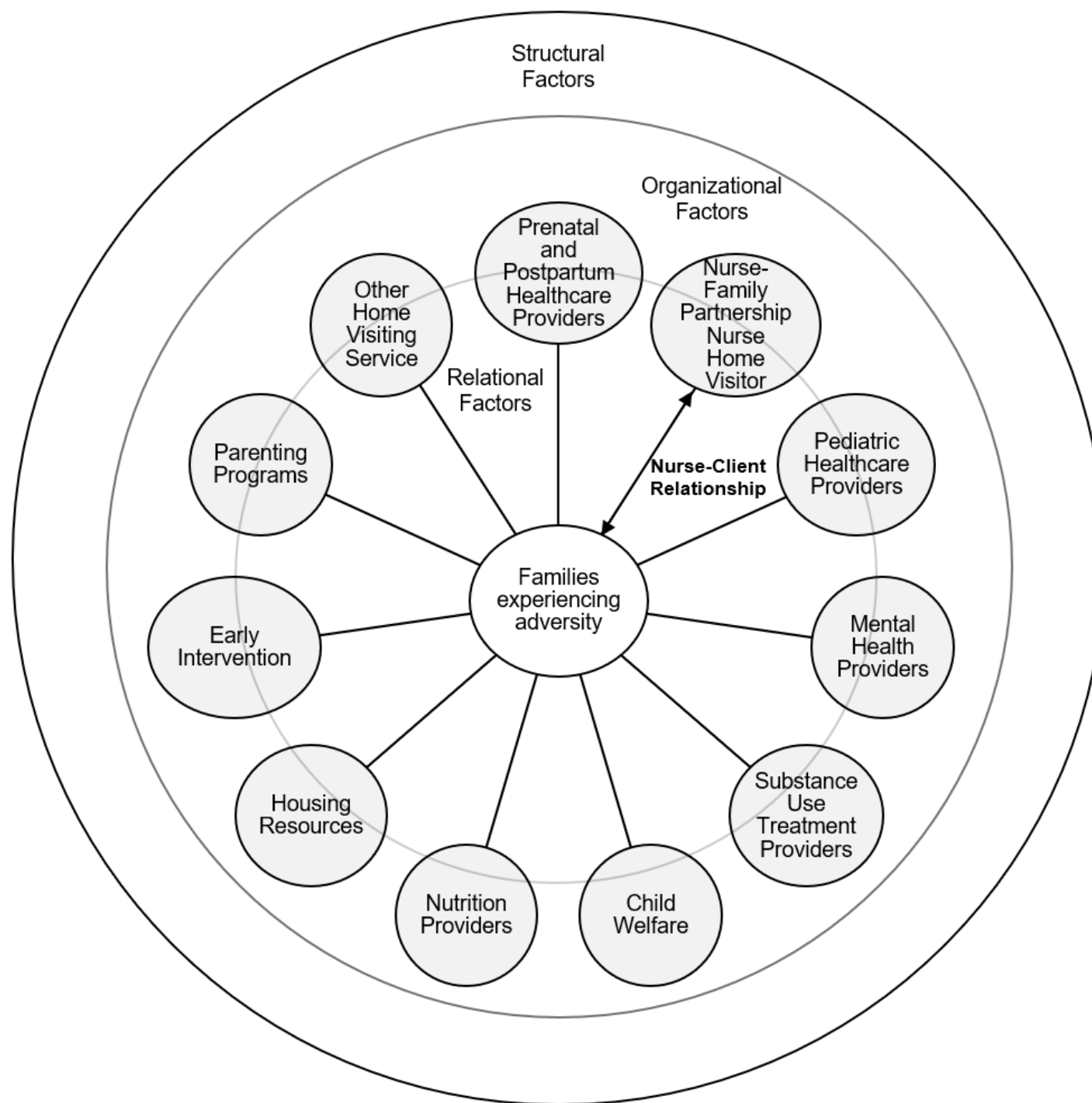
University of Colorado
Anschutz Medical Campus

Conceptual Model/Theory of Change

Systems Alignment
- Shared mission/goals
- Leadership/champions
- Shared resources
- Financial mechanisms

Client characteristics
Nurse characteristics
Site characteristics
Neighborhood characteristics

Organizational Collaboration → Increased Care Coordination → Client Immediate Needs Met → Client Retained in Program → Improved Client Self-Efficacy → Client Risks & Family Outcomes

Interpersonal Factors
- Perceived need/value
- Relational coordination
- Knowledge/awareness

Local, State & Federal Policies
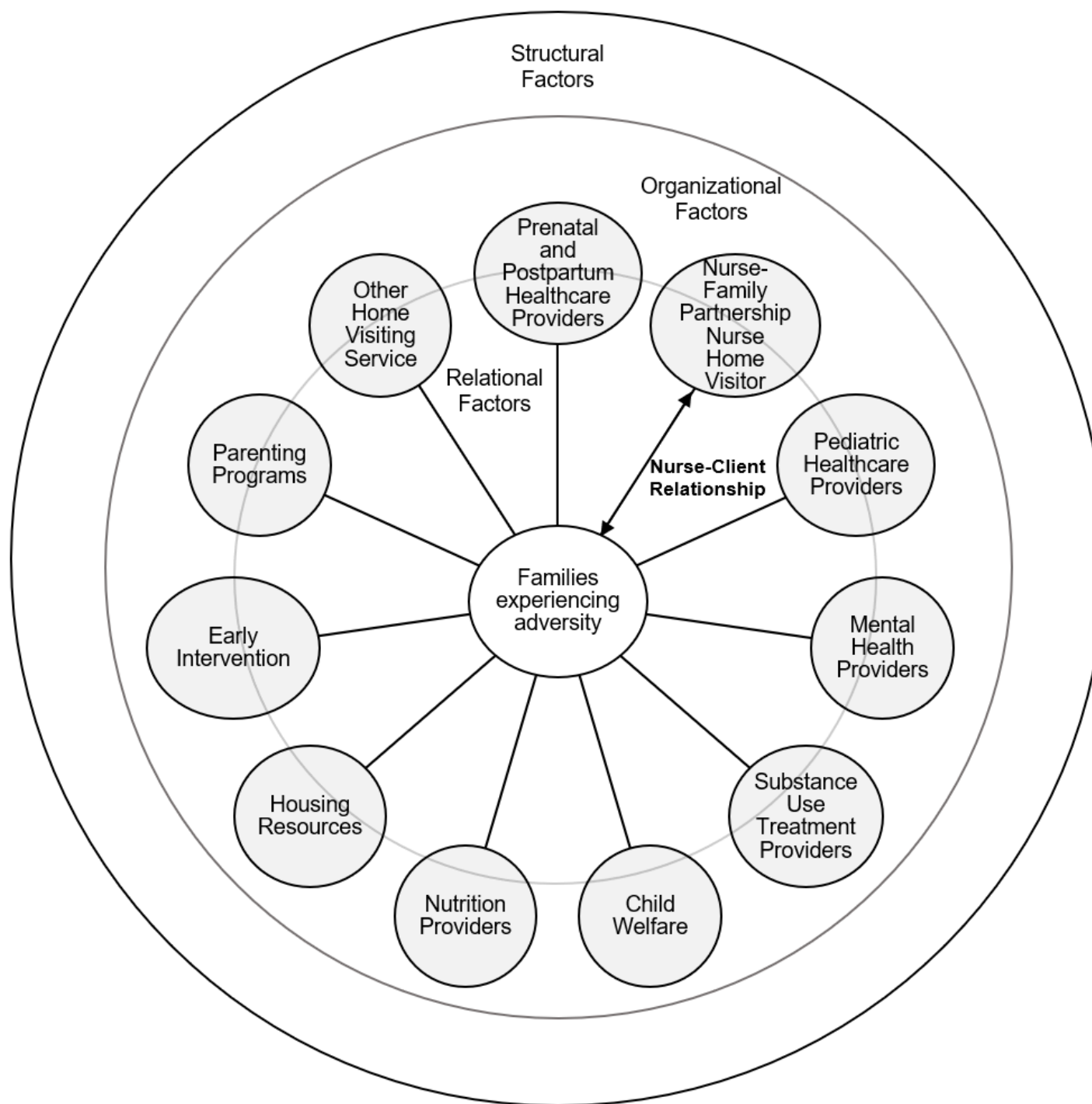
AIM 1: COLLABORATION CHANGES OVER TIME

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

University of Colorado
Anschutz Medical Campus

Relational Factors
High quality
communication +
High quality
relationships

University of Colorado
Anschutz Medical Campus

Relational Factors
High quality
communication +
High quality
relationships

Organizational Factors
Shared policies
Shared funding
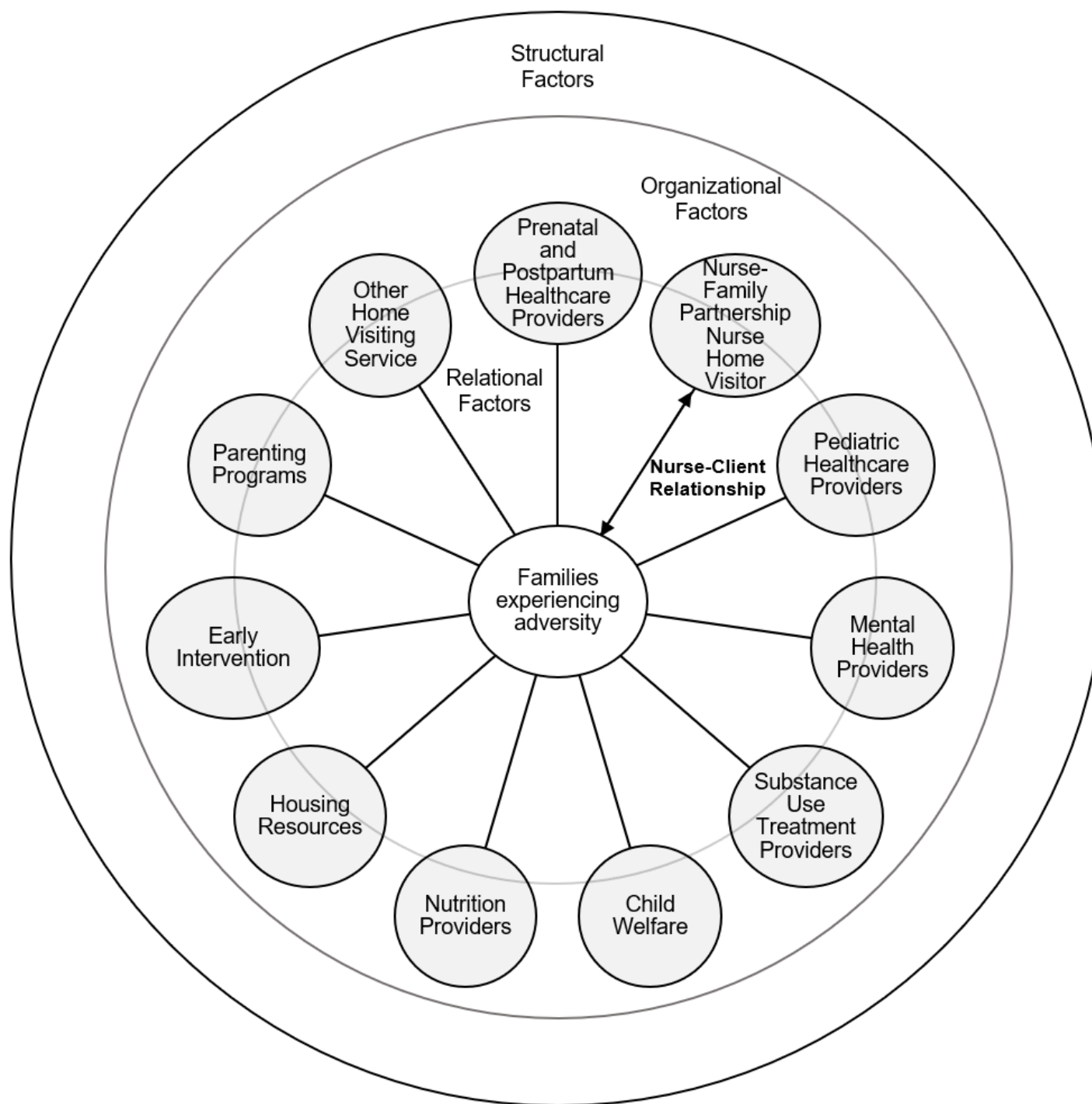
University of Colorado
Anschutz Medical Campus
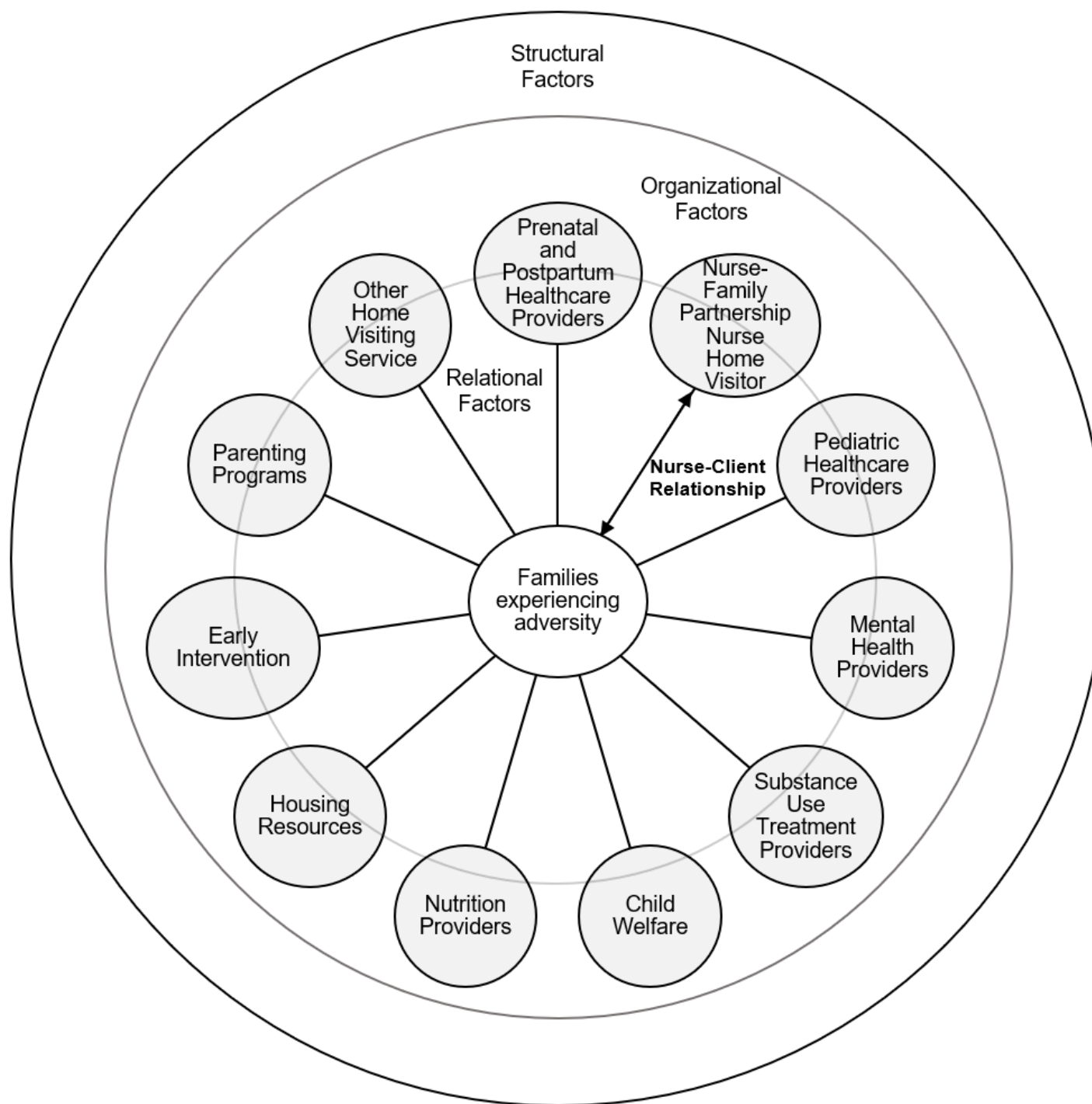
Relational Factors
High quality communication +
High quality relationships
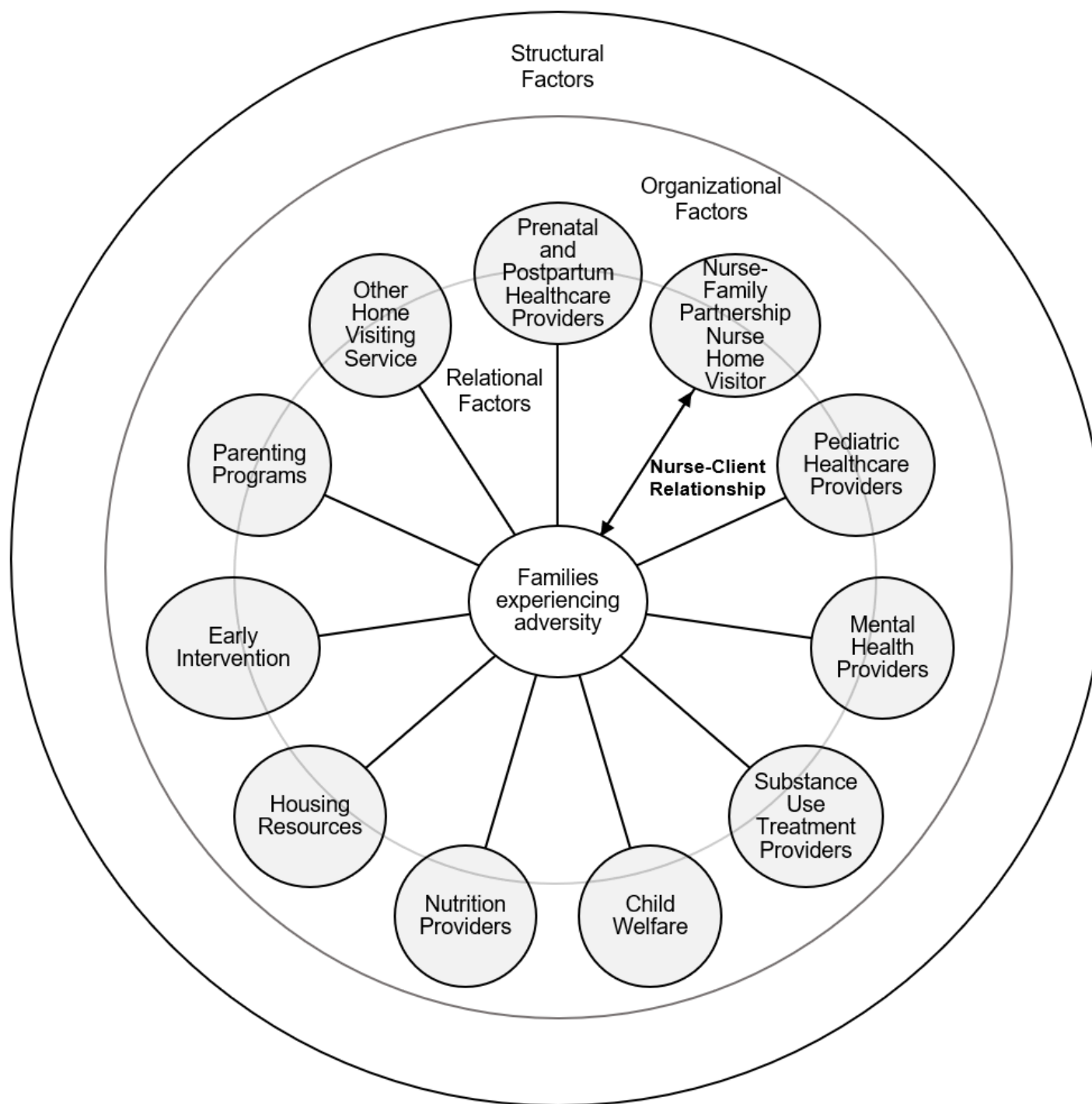
Structural Factors
Shared space
Shared data

Organizational Factors
Shared policies
Shared funding

University of Colorado
Anschutz Medical Campus

17

RELATIONAL COORDINATION measures Relational Factors

STRUCTURAL INTEGRATION measures Structural and Organizational factors

Structural Factors

Organizational Factors

Relational Factors

Other Home Visiting Service

Prenatal and Postpartum Healthcare Providers

Nurse-Family Partnership Nurse Home Visitor

Pediatric Healthcare Providers

Parenting Programs

Nurse-Client Relationship

Families experiencing adversity

Mental Health Providers

Early Intervention

Substance Use Treatment Providers

Housing Resources

Nutrition Providers

Child Welfare

University of Colorado
Anschutz Medical Campus

18

COLLABORATION SURVEY

- Implemented in Fall 2020 via Qualtrics

- Invited 383 NFP nurse supervisors from active teams and sites

- Nurse supervisor completion rate of 77.8% (n=298)

2020 SUMMARY SCORES

Relational Coordination with…	2020				
	Mean	Std. Dev.	Min	Max	n
WIC	3.68	0.82	1.25	5	296
Women's care	3.57	0.73	1.14	5	300
Early intervention	3.36	0.80	1	5	290
Other home visiting service	3.28	0.84	1	5	284
Child welfare	3.26	0.68	1.25	4.86	294
Mental health	3.25	0.73	1	5	297
Pediatric care	3.14	0.76	1	5	294
Parenting programs	3.01	0.85	1	5	262
Substance use treatment	2.76	0.85	1	4.57	286
Housing resources	2.50	0.84	1	4.71	283
Index Score	3.21	0.54	1.29	4.66	296

University of Colorado
Anschutz Medical Campus
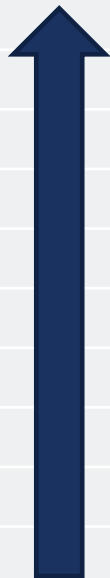
2020 SUMMARY SCORES

Structural Integration with…	Sum	2020 Std. Dev.	Min	Max	n
Other home visiting service	8.20	4.91	4	20	295
WIC	7.75	4.43	1	20	295
Women's care	6.69	4.15	3	20	296
Mental health	6.29	3.84	3	20	293
Pediatric care	5.65	3.32	3	20	295
Early intervention	5.64	3.07	3	20	296
Parenting programs	5.28	2.90	3	20	294
Child welfare	5.19	2.26	3	17	297
Substance use treatment	5.17	2.87	3	20	294
Housing resources	4.44	1.33	3	13	296
Index Score	6.02	1.80	3.9	14.9	297

University of Colorado
Anschutz Medical Campus

2018 TO 2020 CHANGES

- Improved coordination with Women's Care

- Decreased coordination with WIC & parenting programs

- Less integration with parenting programs

MATCHED COORDINATION SCORES

Relational coordination with		2018	2020
WIC**	M (SD) n	3.85 (0.83) 173	3.73 (0.80) 173
Women's care***	M (SD) n	3.46 (0.77) 177	3.66 (0.72) 177
Early intervention	M (SD) n	3.54 (0.84) 171	3.44 (0.80) 171
Child welfare	M (SD) n	3.37 (0.70) 173	3.38 (0.66) 173
Mental health	M (SD) n	3.29 (0.78) 169	3.27 (0.73) 169
Pediatric care	M (SD) n	3.19 (0.82) 170	3.26 (0.77) 170
Parenting programs**	M (SD) n	3.28 (0.94) 141	3.10 (0.85) 141
Substance use treatment	M (SD) n	2.82 (0.89) 161	2.83 (0.84) 161
Housing resources	M (SD) n	2.64 (0.91) 159	2.56 (0.84) 159

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

University of Colorado
Anschutz Medical Campus

MATCHED INTEGRATION SCORES

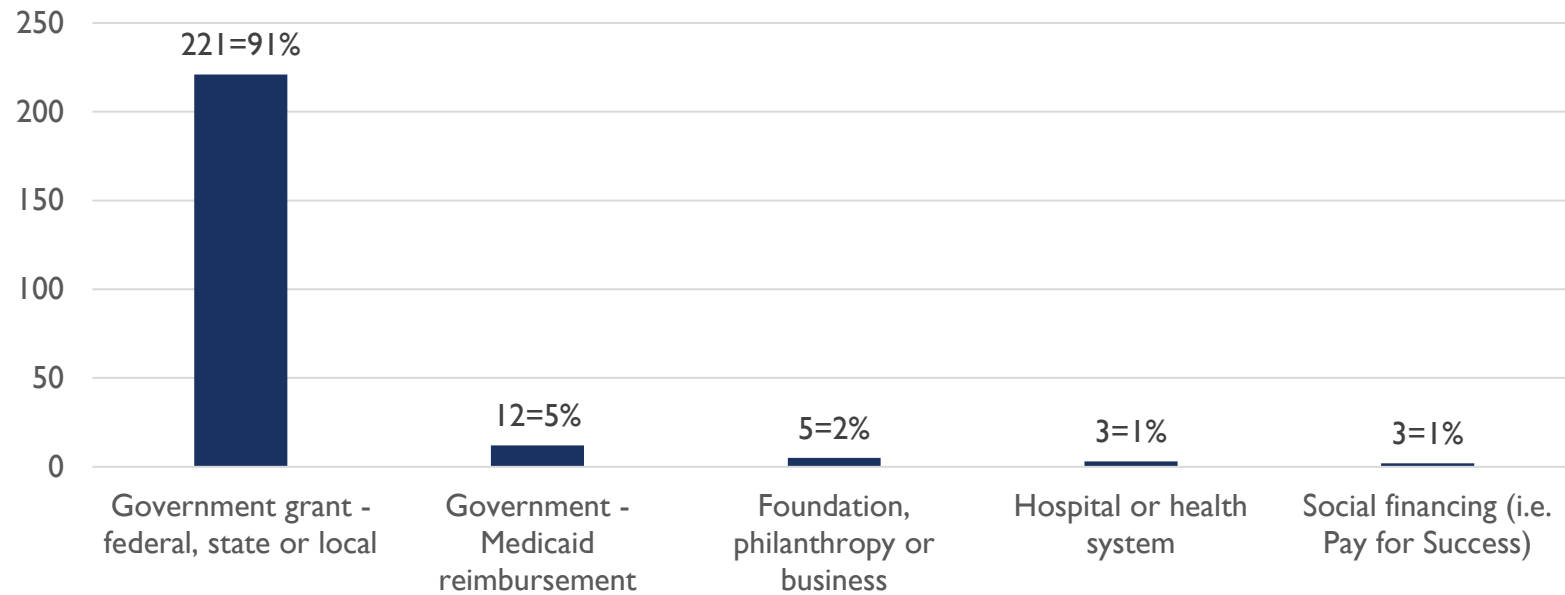|		2018	2020
Structural Integration with…			
WIC	M (SD)	7.95 (4.07)	7.99 (4.63)
	n	163	163
Women's care	M (SD)	6.57 (3.72)	6.78 (4.23)
	n	169	169
Mental health	M (SD)	6.77 (3.67)	6.26 (3.88)
	n	166	166
Pediatric care	M (SD)	5.95 (3.56)	5.77 (3.43)
	n	168	168
Early intervention	M (SD)	5.75 (3.39)	5.91 (3.42)
	n	164	164
Parenting programs***	M (SD)	6.56 (3.65)	5.27 (2.94)
	n	161	161
Child welfare	M (SD)	5.45 (2.67)	5.31 (2.43)
	n	162	162
Substance use treatment	M (SD)	5.08 (2.34)	5.15 (2.93)
	n	165	165
Housing resources	M (SD)	4.44 (1.39)	4.48 (1.45)
	n	163	163

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

AGENCY FUNDING SURVEY

- Implemented in Winter 2020 via Qualtrics

- Invited administrators from **268** active sites

- Site Completion Rate of 90.7% (n=243)

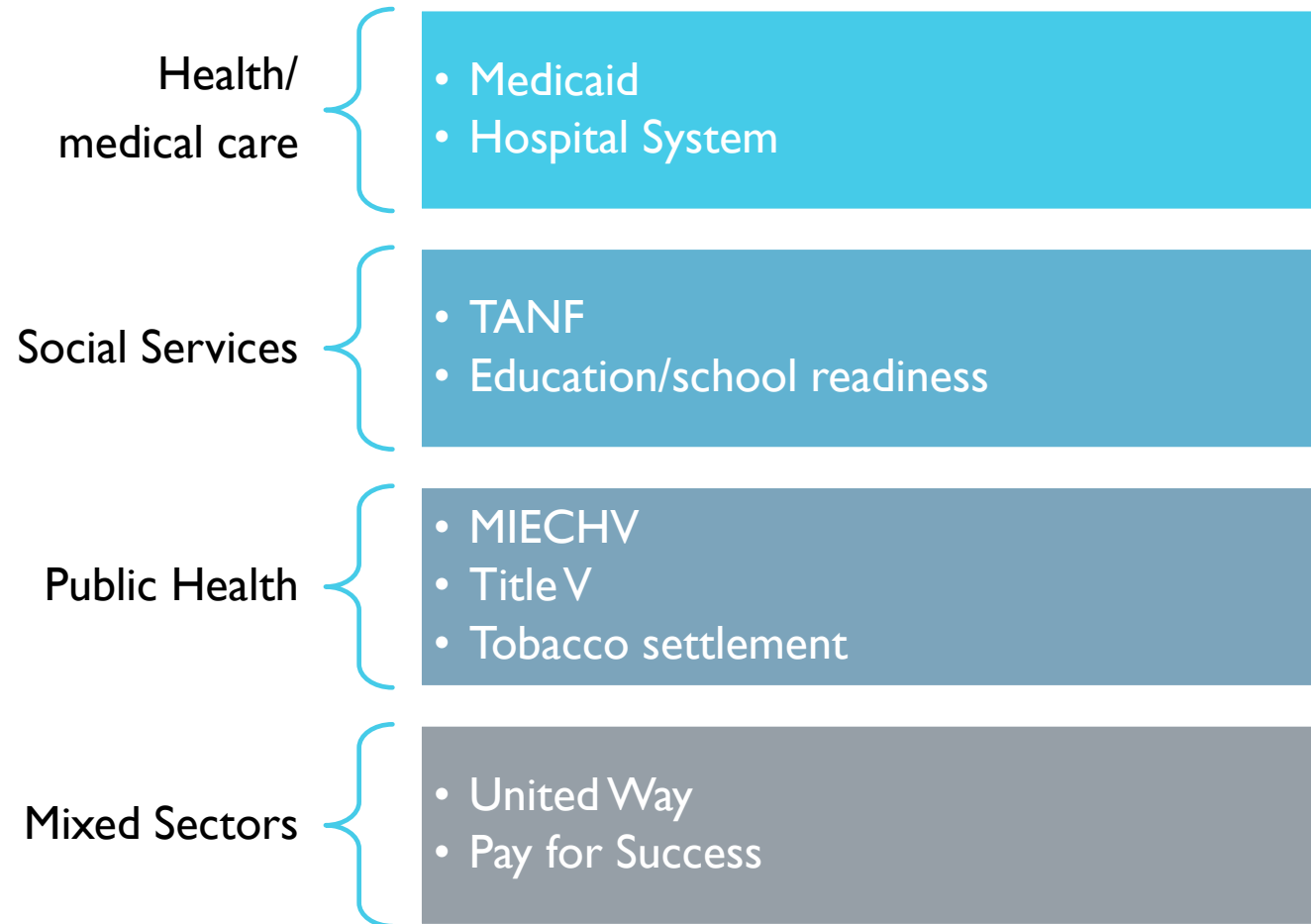- 213 sites have completed Agency Funding AND Collaboration survey (79.5% of sites)

University of Colorado
Anschutz Medical Campus

LARGEST FUNDING SOURCE

FUNDING SOURCE – SECTOR & DEFINITION

Sector	Definition
Health/medical care	The medical sector includes the organizations, programs, and services that help individuals obtain access to personal health services that promote positive health outcomes such as through prevention, treatment, or management of conditions, diseases and injuries, including services for obstetrics and pediatrics care in terms of physical health conditions, mental health conditions, substance abuse, and developmental disabilities.
Social service	The social service sector includes the organizations, programs and services that work to address fundamental human needs and promote social wellbeing.
Public health	The public health sector includes the organizations, programs and activities that work to create the conditions in which people can live healthy lives, including activities to prevent disease and injury and promote health for the population at large.
Mixed	The mixed sector is used if the organization, program or service falls into more than one of the above sectors.

University of Colorado
Anschutz Medical Campus

SECTOR EXAMPLES

Health/ medical care
- Medicaid
- Hospital System

Social Services
- TANF
- Education/school readiness

Public Health
- MIECHV
- Title V
- Tobacco settlement

Mixed Sectors
- United Way
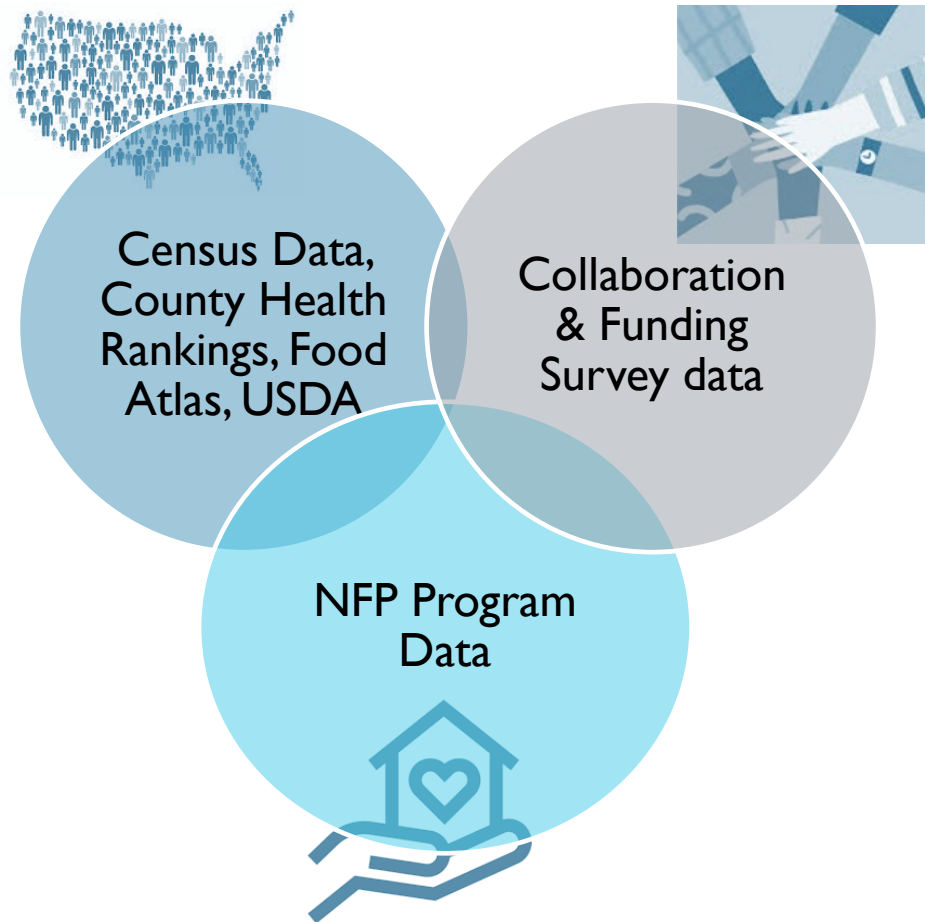- Pay for Success

University of Colorado
Anschutz Medical Campus
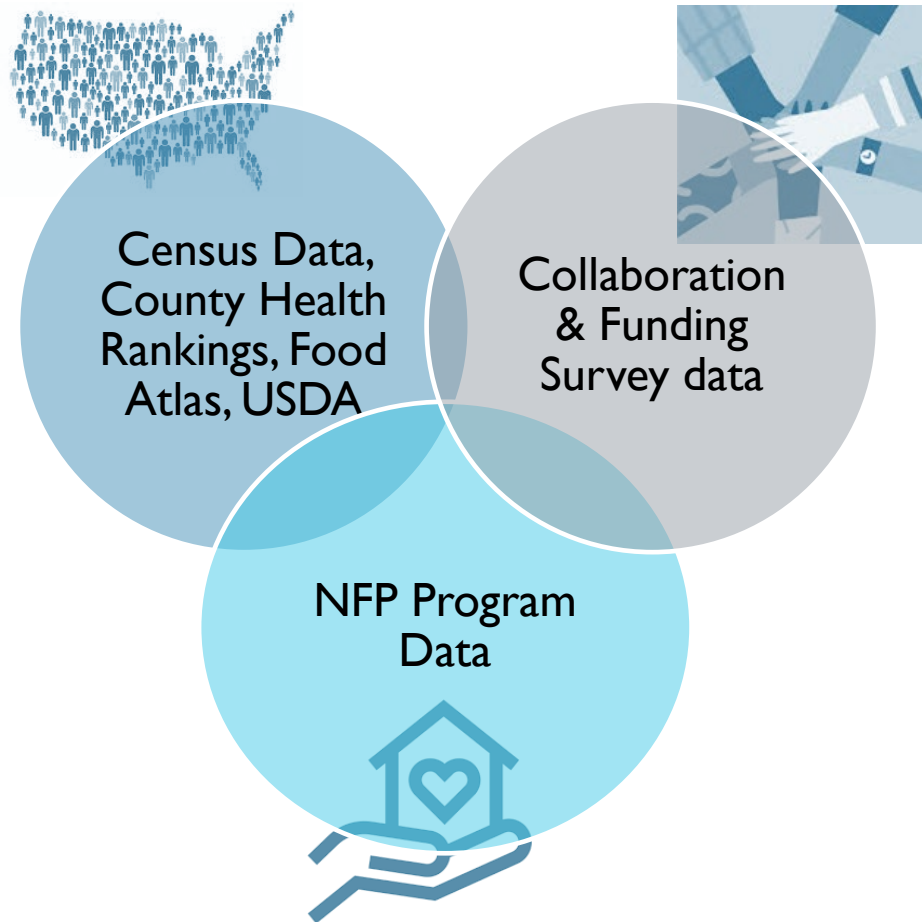
AIM 2: COLLABORATION & OUTCOMES

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

University of Colorado
Anschutz Medical Campus

DATA

Census Data, County Health Rankings, Food Atlas, USDA

Collaboration & Funding Survey data

NFP Program Data

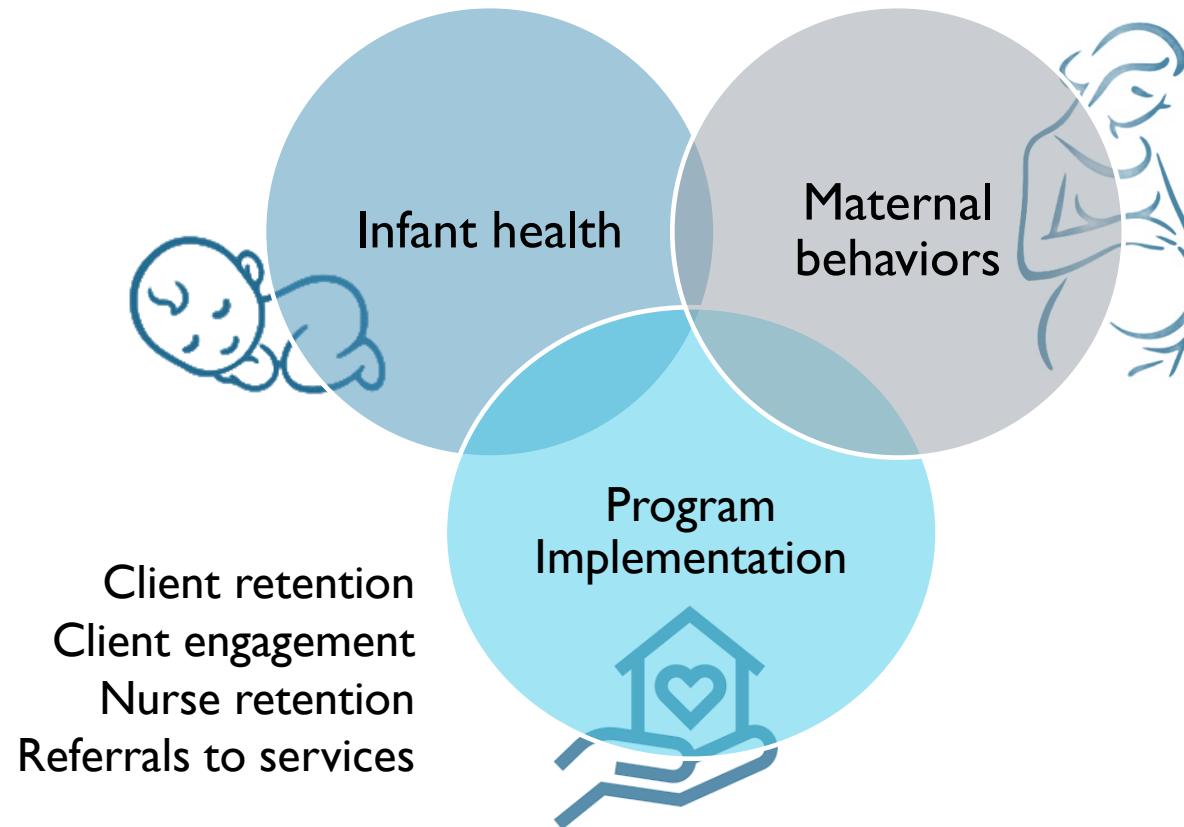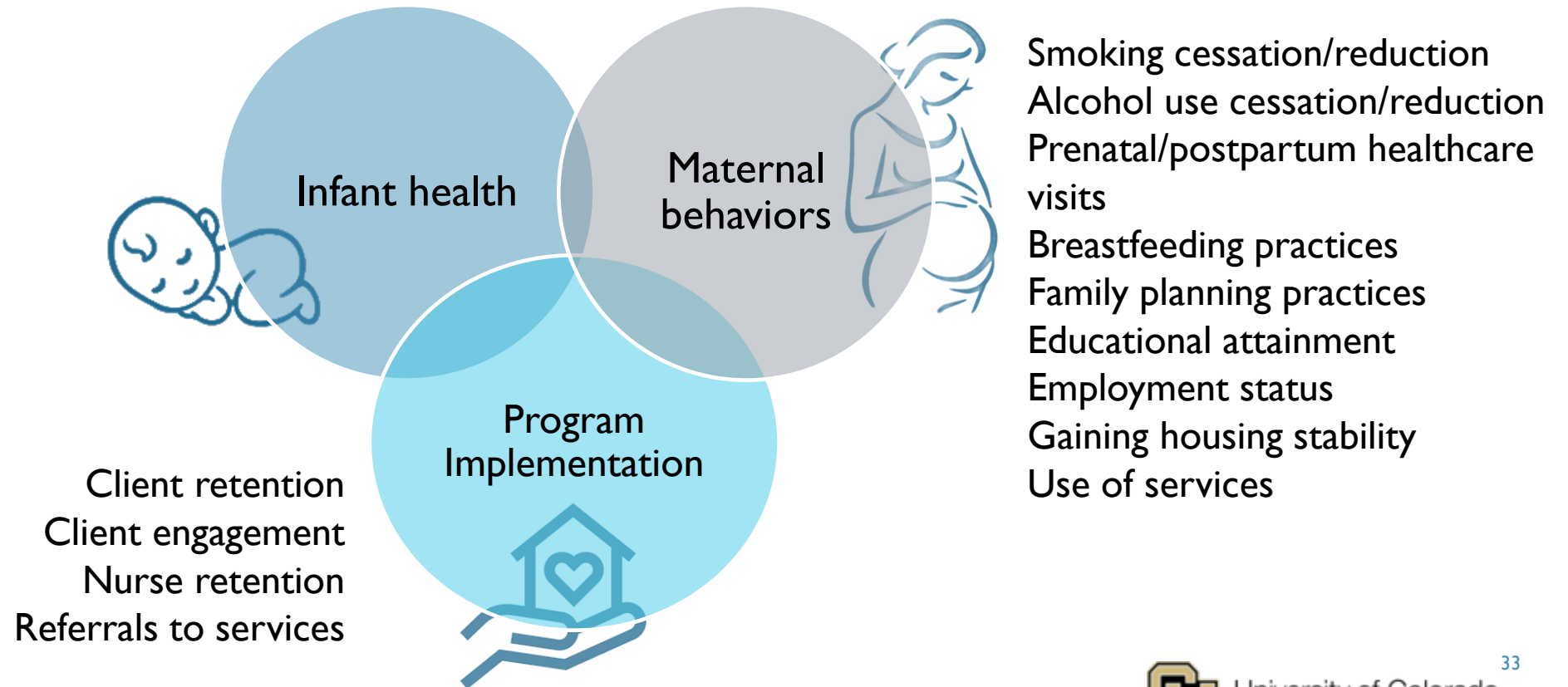University of Colorado
Anschutz Medical Campus

DATA

- NFP clients with their first visit between Jan 1, 2015 and Dec 31, 2020
- Clients matched to nurse with most home visits with that client
- Inclusion criteria: 4+ visits and have birthed
- Exclusion criteria: ceased participation due to moving, miscarriage, lost custody, child death
- Covariates: client-, nurse-, site-, neighborhood-level

Census Data, County Health Rankings, Food Atlas, USDA

Collaboration & Funding Survey data

NFP Program Data

University of Colorado
Anschutz Medical Campus

OUTCOMES

Infant health

Maternal behaviors

Program Implementation

Client retention
Client engagement
Nurse retention
Referrals to services

University of Colorado
Anschutz Medical Campus

OUTCOMES

Infant health

Maternal behaviors

Program Implementation

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

Client retention
Client engagement
Nurse retention
Referrals to services

University of Colorado
Anschutz Medical Campus

OUTCOMES

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

Infant health

Maternal behaviors

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

Program Implementation

Client retention
Client engagement
Nurse retention
Referrals to services

34

University of Colorado
Anschutz Medical Campus

Mixed associations with client retention

	Client retention at birth Adjusted Odds Ratio[a]	Client retention at 6 months Adjusted Odds Ratio[a]	Client retention at 12 months Adjusted Odds Ratio[a]	Client retention at 18 months Adjusted Odds Ratio[a]	Client retention at 22 months Adjusted Odds Ratio[a]
Relational Coordination with Obstetrics	1.090	n/a	n/a	n/a	n/a
with Pediatrics	n/a	1.340***	1.319***	1.314***	1.278***
with Mental health	1.060	1.011	1.000	1.045	1.042
with Substance use treatment	0.935	0.839**	0.832**	0.807**	0.811**
with WIC	0.889*	0.887*	0.910	0.910	0.941
with Child Welfare	0.857**	0.854*	0.819**	0.864	0.890
with Housing	1.051	1.029	1.009	0.975	1.010
with Other home visiting services	0.969	0.963	0.972	0.938	0.929
with Parenting	0.974	0.980	0.983	1.018	0.999
with Early intervention	1.066	1.048	1.103	1.078	1.063
Structural Integration with Obstetrics	1.006	n/a	n/a	n/a	n/a
with Pediatrics	n/a	1.004	0.998	0.992	0.990
with Mental health	0.995	1.015	1.021	1.021	1.024
with Substance use treatment	1.006	0.995	0.998	0.993	0.995
with WIC	1.047***	1.043***	1.045***	1.047***	1.038**
with Child Welfare	1.066***	1.042*	1.048*	1.062**	1.062**
with Housing	1.026	1.049	1.043	1.012	1.002
with Other home visiting services	0.988	0.979*	0.976*	0.978*	0.984
with Parenting	0.997	0.998	0.997	0.996	0.994
with Early intervention	0.986	0.987	0.986	0.991	0.993
Nurse-level variance	51233	47645	43563	39027	31838
Intra-class correlation	0.195	0.305	0.357	0.366	0.333
Observations	0.799	1.441	1.824	1.899	1.643

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

University of Colorado
Anschutz Medical Campus

	Client retention at birth Adjusted Odds Ratio[a]	Client retention at 6 months Adjusted Odds Ratio[a]	Client retention at 12 months Adjusted Odds Ratio[a]	Client retention at 18 months Adjusted Odds Ratio[a]	Client retention at 22 months Adjusted Odds Ratio[a]
Client age	1.029***	1.040***	1.046***	1.052***	1.055***
Client Race: White	Reference	Reference	Reference	Reference	Reference
Black	1.097*	0.858***	0.786***	0.774***	0.781***
Other/Mixed	0.994	0.972	0.94	0.952	0.951
Declined/Unknown	0.864*	1.008	1.041	1.009	0.988
Client Marital Status: Single	Reference	Reference	Reference	Reference	Reference
Married	1.348***	1.391***	1.362***	1.429***	1.480***
Live with Partner	0.774***	0.753***	0.752***	0.814***	0.842*
Widowed/Divorced/Separated	0.898	0.876	0.811*	0.867	0.931
Client completed High School or GED	1.047	1.241***	1.323***	1.347***	1.378***
Client Living Circumstance: Live with others	Reference	Reference	Reference	Reference	Reference
Live alone	0.858*	0.900*	0.955	0.953	0.93
Homeless	0.629***	0.622***	0.599***	0.582***	0.606***
Nurse-level variance	51233	47645	43563	39027	31838
Intra-class correlation	0.195	0.305	0.357	0.366	0.333
Observations	0.799	1.441	1.824	1.899	1.643

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

University of Colorado
Anschutz Medical Campus

	Client retention at birth Adjusted Odds Ratio[a]	Client retention at 6 months Adjusted Odds Ratio[a]	Client retention at 12 months Adjusted Odds Ratio[a]	Client retention at 18 months Adjusted Odds Ratio[a]	Client retention at 22 months Adjusted Odds Ratio[a]
Agency Type: Government	Reference	Reference	Reference	Reference	Reference
Health care	1.463***	1.434***	1.556***	1.604***	1.610***
Community based organization	1.171	1.175	1.151	1.194	1.221
Education	1.781***	1.911***	2.082**	2.441***	2.967***
Funding Sector: Public health	Reference	Reference	Reference	Reference	Reference
Social Services	1.144	1.013	1.076	1.238	1.123
Healthcare	1.038	0.86	0.807	0.824	0.833
Mixed	0.991	1.133	1.211*	1.206	1.201
Funding Longevity: 1 year	Reference	Reference	Reference	Reference	Reference
1-3 years	0.536**	0.701	0.749	0.653	0.550*
3-5 years	0.708	0.931	0.896	0.697	0.518*
5+ years	0.618**	0.756	0.707	0.604*	0.552**
Unknown end date	0.593**	0.705	0.692	0.643	0.539*
No end date	0.785	0.911	0.942	0.814	0.697
Funding Renewal: No renewal date	Reference	Reference	Reference	Reference	Reference
Annual	1.117	1.068	0.888	0.939	0.893
Every 2-3 years	0.986	1.096	0.913	0.978	1.038
Every 4-5 years	1.002	1.126	0.884	0.903	0.83
Other timeframe	0.956	1.176	0.983	0.929	0.807
Unknown	1.508	1.657*	1.297	1.156	1.017
Nurse-level variance	51233	47645	43563	39027	31838
Intra-class correlation	0.195	0.305	0.357	0.366	0.333
Observations	0.799	1.441	1.824	1.899	1.643

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

University of Colorado
Anschutz Medical Campus

EARLY INTERPRETATIONS

Collaboration matters but the exact dynamics are challenging and complicated to interpret

- Positive associations between coordination with pediatrics and client retention postpartum

- Negative associations between coordination with substance use, WIC and CPS and client retention; also integration with other home visiting

- Agency type may play role in retention

University of Colorado
Anschutz Medical Campus

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)

University of Colorado
Anschutz Medical Campus

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 care
    - Integration with pediatrics care
    - Integration with child welfare
- Above national average for client retention

University of Colorado
Anschutz Medical Campus

FIVE CASE STUDIES

CBO
(Urban & Rural RI)

LPHA
(Rural CO)

Health system
(Urban PA)

Health system
(Urban TX)

LPHA
(Urban FL)
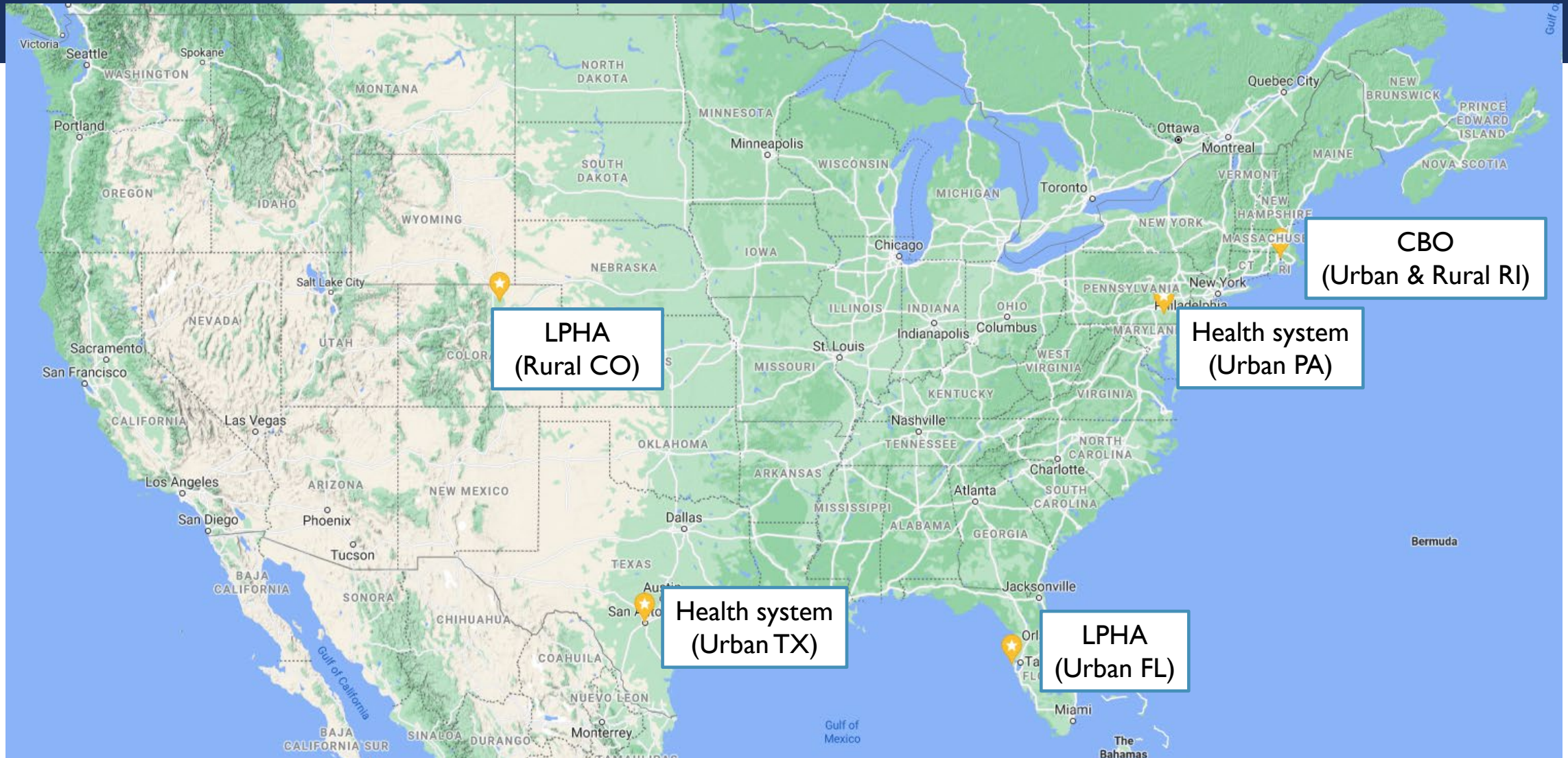
IMPLICATIONS FOR FAMILY WELL-BEING

Commentary by Jade Woodard, MPA

Executive Director of Illuminate Colorado

University of Colorado
Anschutz Medical Campus

QUESTIONS?

Venice Ng Williams, PhD, MPH
venice.williams@cuanschutz.edu

Mandy Allison, MD, MSPH, MEd
mandy.allison@cuanschutz.edu

Greg Tung, PhD, MPH
gregory.tung@cuanschutz.edu

Jade Woodard, MPA
jwoodard@illuminatecolorado.org

S4A
Systems for Action

We want to hear your ideas for how we can **better support practice-based organizations in conducting research** sponsored by the Robert Wood Johnson Foundation Systems for Action research program.

The ideas received from the Request for Information will be used to develop a new initiative devoted to helping practice-based organizations engage in S4A systems alignment research.
👉 https://tinyurl.com/systemsforactionrfi

Sept. 1 — **Evaluating Inclusiveness of Multisector Community Health Networks**
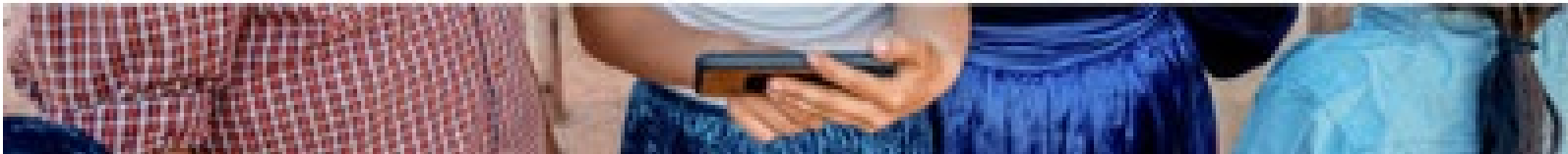
https://ucdenver.zoom.us/webinar/register/WN_PynlbtsWTPyx3uHVtwBiGA

Acknowledgements