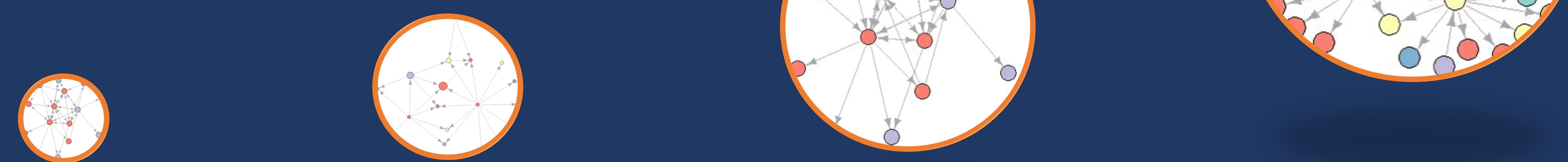# Title: Developing Cross-Sector Referral Networks to Address Social Determinants of Health: Results from a Multi-Year Evaluation
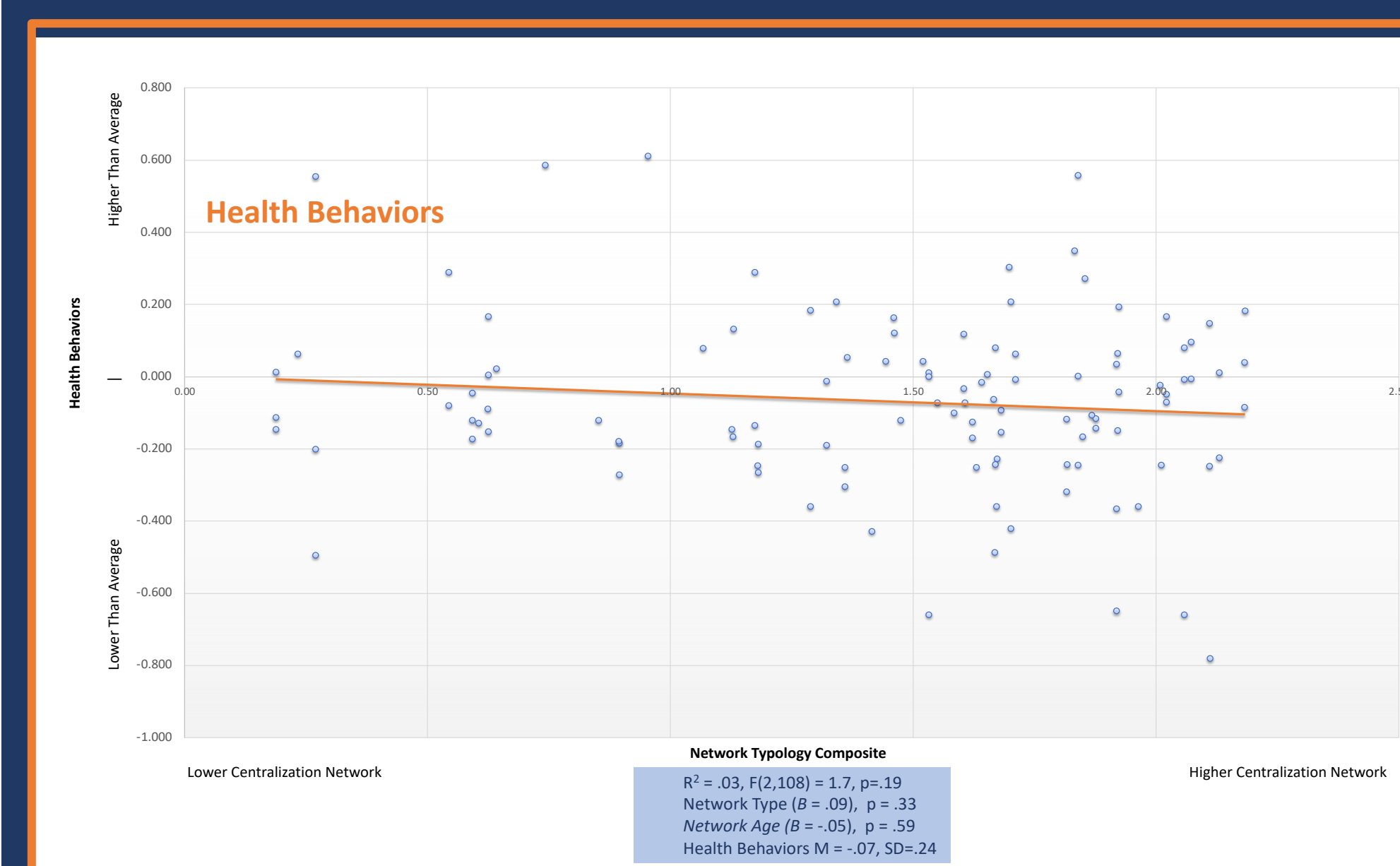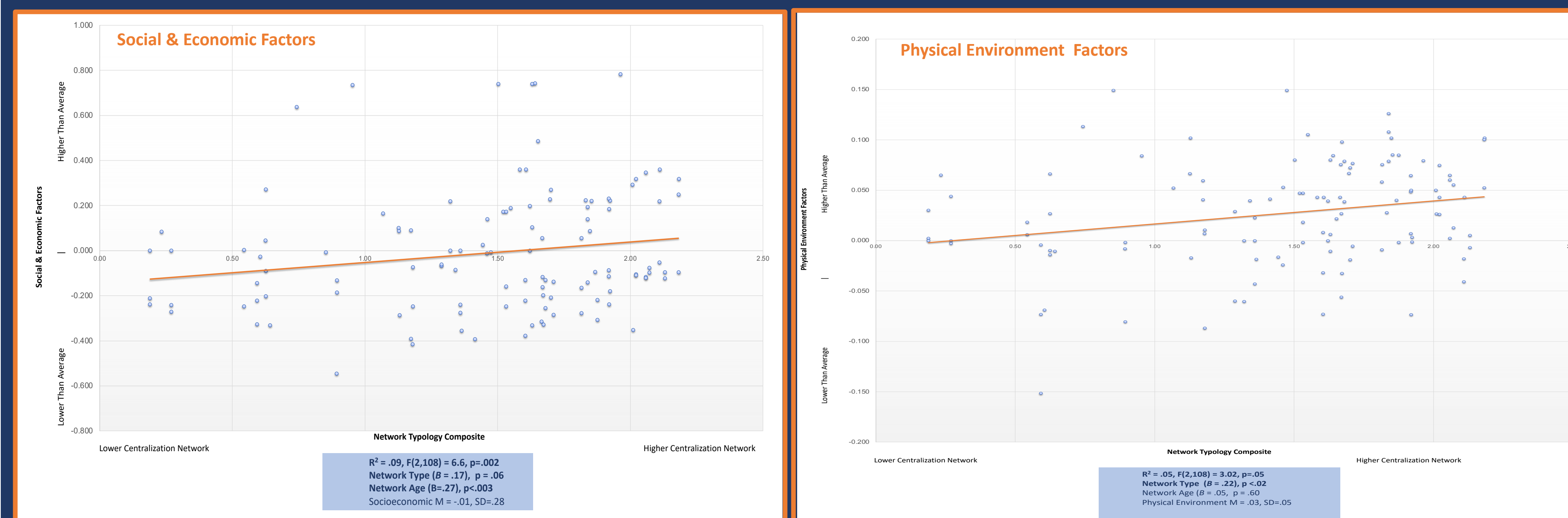
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KU THE UNIVERSITY OF KANSAS
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BACKGROUND

- **Community-level health outcomes and factors will remain unaffected** in places where health and social care sectors are siloed, services coordination is poor, and equity is unaddressed.
- **Community Care Networks** can be built and strengthened through the use of technology, mutual & reciprocal actions, and shared accountability.
- Community Care Networks have the power to **expand equitable health services, social care, and concrete support further into the community** with last mile non-traditional partners and trust brokers.

CROSS-SECTOR IRIS COMMUNITY CARE NETWORKS

Community partners created **collaborative referral networks of cross-sector partners** to **coordinate services and refer individuals to each other** using a referral technology tool – IRIS.

Cross-Sector Partners
- Behavioral Health
- Concrete Supports
- Developmental Disabilities
- Early Childhood
- Maternal & Child Health
- Health & Public Health
- Family Support
- Education
- Resource Navigation
- Housing
- Crisis response, public safety

Purpose-built for impact

IRIS is a collaboration tool powered by people and technology for the benefit of all. Our approach is built on extensive experience working with communities to design a common set of systems to simplify onboarding and communication, facilitate collaboration, and maximize efficiency.

1,745	72,222	41,907
PARTNERS	REFERRALS GIVEN	FAMILIES REFERRED

NETWORK POPULATION

44 individual IRIS community care networks were comprised of **1,745 cross-sector organizations** sharing **closed-loop service referrals** from **2018-2022** active in four states.

NETWORK DATA

IRIS – a network building and referral technology tool – provides individual **referral data to/from organizations** (nodes) in each community care network **to measure linkages** (edges) and **identify network structure** (typology). Annual network data was compiled and coded in order to control for network age or maturity effects in regression tests of typology on outcomes.

Highly connected **Community Care Networks** improve **social, economic, and physical environment** outcomes in communities.

The **more cohesive and centralized a referral networks is**, the more likely it is to have **higher than average** social, economic and physical environment outcomes in their community


Social & Economic Factors

R^2 = .09, $F(2,108)$ = 6.6, p=.002
Network Type (B = .17), p =.06
Network Age (B=.27), p<.003
Socioeconomic M = -.01, SD=.28

Physical Environment Factors

R^2 = .05, $F(2,108)$ = 3.02, p=.05
Network Type (B = .22), p =.02
Network Age (B = .05, p = .60
Physical Environment M = .03, SD=.05)

Health Behaviors

R^2 = .03, $F(2,108)$ = 1.7, p=.19
Network Type (B = .09), p =.33
Network Age (B = -.05), p =.59
Health Behaviors M = -.07, SD=.24

Correlations between Network Typology & Health Factors

	Network Typology	Health Behaviors	Clinical Care	Socio-Economic	Physical Environment
Network Typology (M=1.45, SD=.54 min/max: .19/2.2)					
Health Behaviors (M= -.07, SD=.24 min/max: -.77/.61)	.10				
Clinical Care (M= -.005 SD= 1.07 min/max: -2.7/1.5)	-.05	.31**			
Socio-Economic (M= -.01, SD= .28 min/max: -.54/.78)	.19*	.66**	.43**		
Physical Environment (M= .03, SD=.05 min/max: -.15/.15)	.23*	.30**	.23*	.38**	

*p <.10 *p<.05 **p<.01 ***p<.005

Improving clinical care access and quality may require a **different kind of network structure, be harder to address, or take longer** to change at a community level.
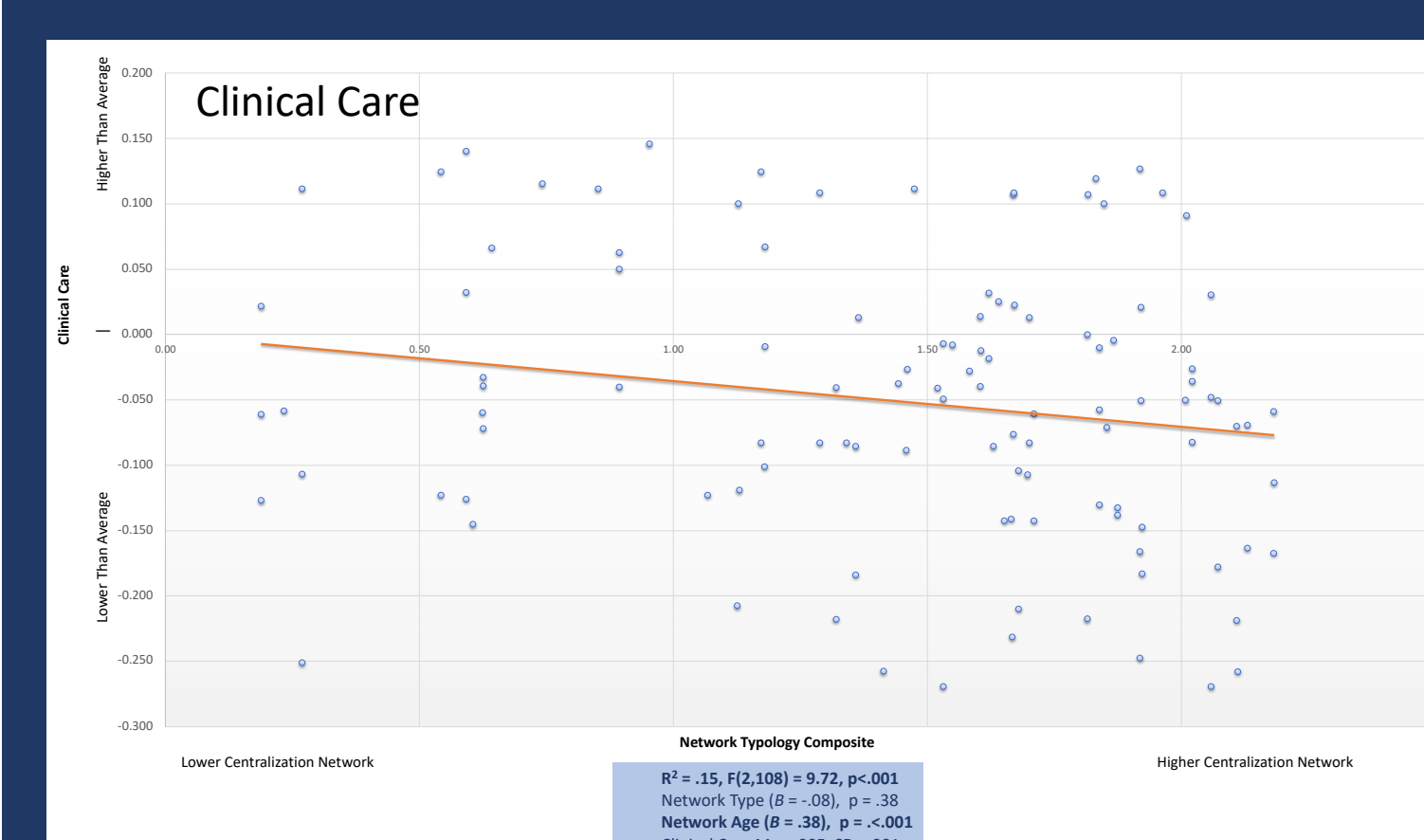
These results point to specific pathways for **optimizing community care networks** that provide the **best possible chance of changing entrenched social health and well-being outcomes**.
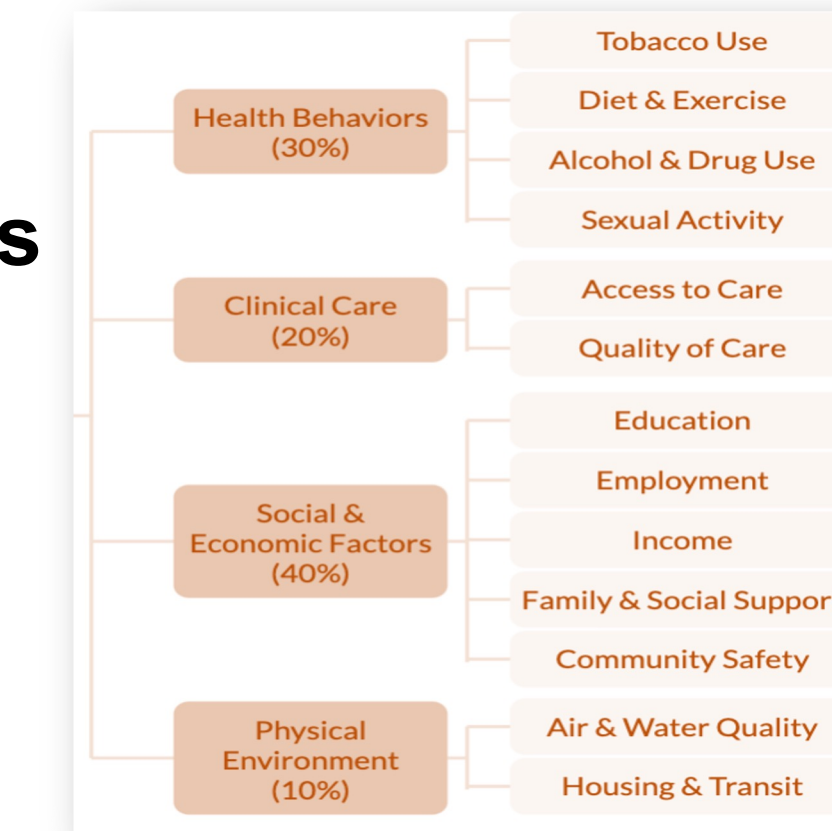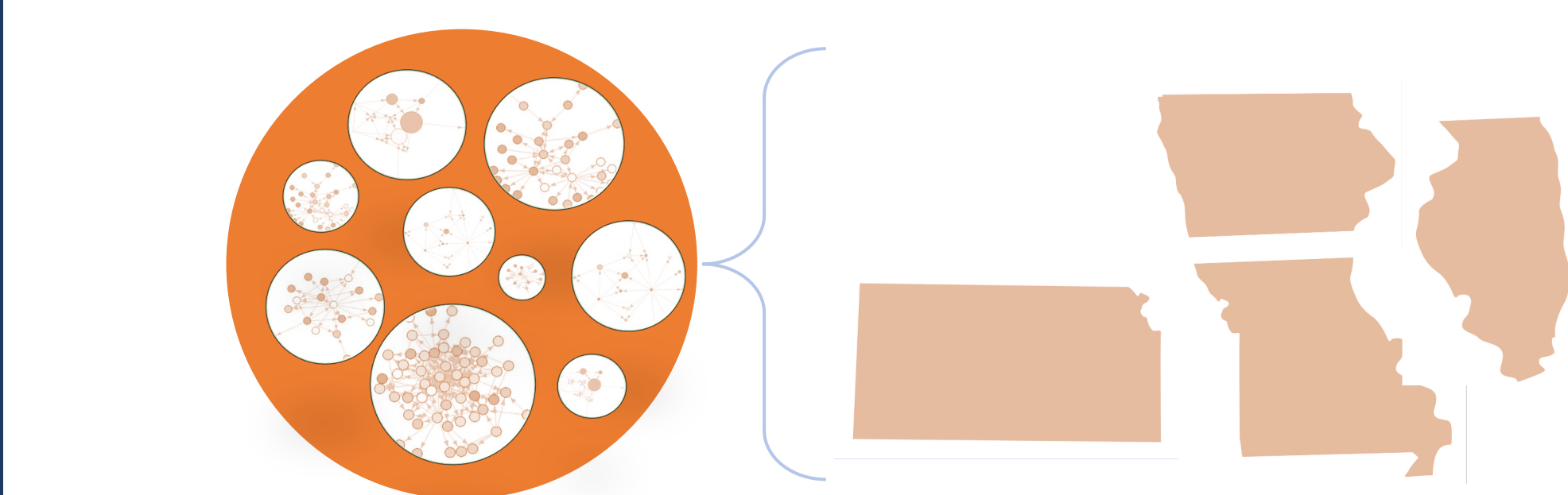

Clinical Care

R^2 = .11, $F(2,108)$ = 6.72, p=.001
Network Type (B = -.59), p =.33
Network Age (B = .49), p =.003
Clinical Care M = -.005, SD=.001

Take a picture to **learn more about IRIS and its impact** – – – →

METHODS & ANALYSIS

1. Conducted **Social Network Analyses** on a population of **44 community care networks.**

2. Computed composite **Network Typology** score for each network using five **SNA metrics:**
   - Betweenness centrality
   - Closeness centrality
   - Degree centrality
   - Eigenvector centrality
   - Network Density
   - Clustering coefficient

3. Integrated **matched county-level network geography data to Health Factors data** from *County Health Rankings & Roadmap 2023 (University of Wisconsin Population Health Institute)*:
   - **Social & Economic Factors**
   - **Physical Environment Factors**
   - **Health Behaviors**
   - **Clinical Care**

A positive Z-score on Health Factors indicates a value for that county higher than the average of counties in that state; a negative Z-score indicates a value for that county lower than the average of counties in that state.

4. Conducted **Linear Regressions** to analyze the relationship of **Network Typology** with each **Health Factor**, controlling for network maturity over time.

RESULTS

Network Typology

IRIS Networks that were more 'centralized' were characterized by **nodes that act as bridges, efficiently connecting various parts of the network**, and nodes with short paths to most others. Many organizations in the network have numerous connections, and some are connected to other influential organizations. **The network as a whole is densely connected, and there is a strong tendency for nodes to form clusters**. This 'centralized' network is likely to be **highly cohesive**, with both global and local influence, and it exhibits a balance between overall connectivity and smaller, tightly interconnected subgroups of organizations.

Network Typology is Related to Certain Health Factors

Regression results showed that when controlling for network maturity, **Centralized Social Care Networks** were **positively and significantly related to higher than average Social & Economic and Physical Environment scores in their communities**. Network typology tended to be positively related to Health Behaviors (but non-significant). Clinical Care outcomes tended to be lower than average (but non-significant) as network centralization increased.

CONCLUSIONS

Community Care Networks using IRIS were able to **improve community-level health factors** by developing authentic and collaborative **cross-sector** partnerships to coordinate services. With a **highly cohesive and efficient referral network**, these community partners were able to ensure individuals were connected to and received the social care they needed. This in turn had **positive consequences for community health for all.**

KU Center for Public Partnerships and Research