‘Co-construction’ of community infrastructure to reduce health disparities

Exploring sociotechnical design in the Jackson CBRN and Longmont Enabling Caring Communities projects.

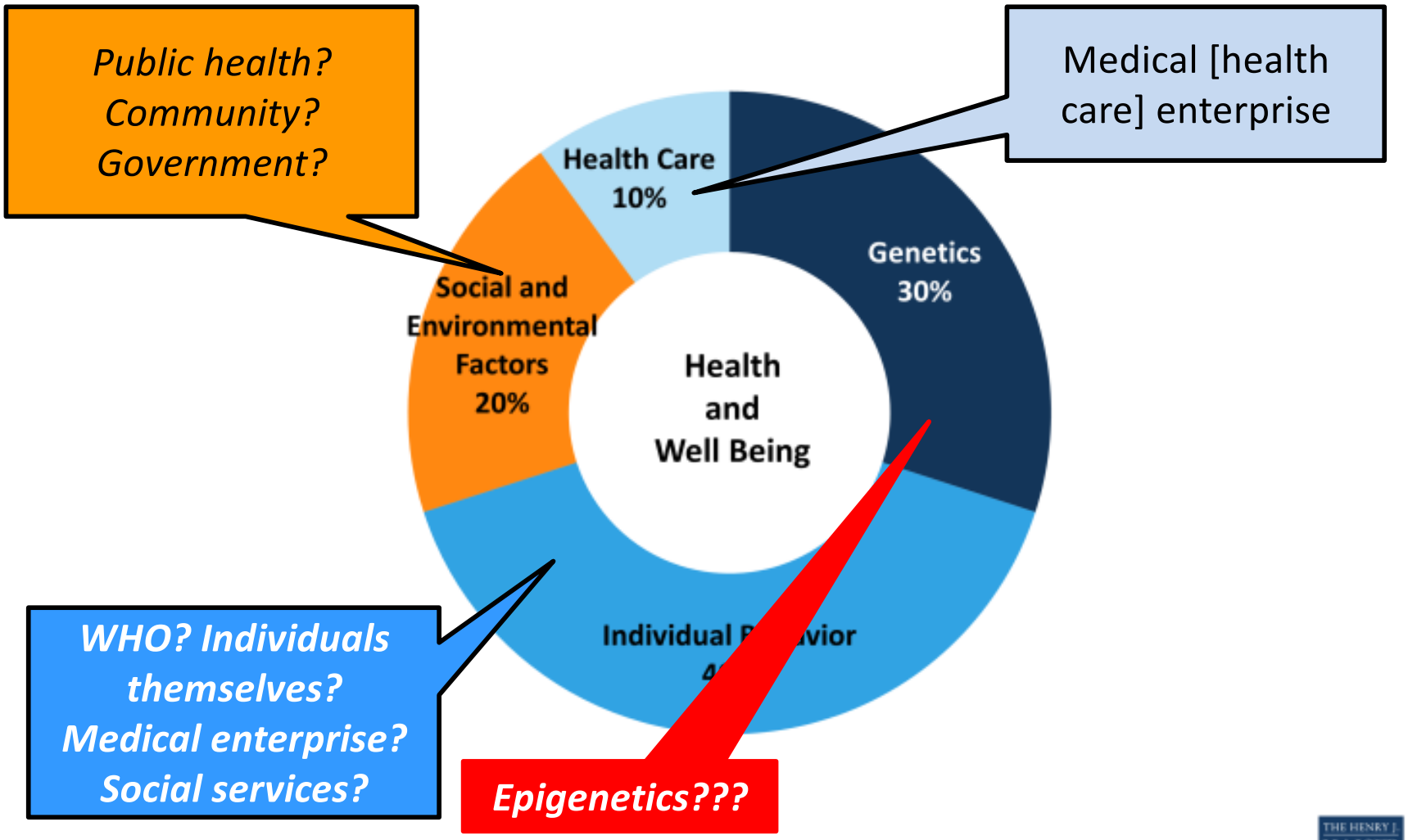
Mike Klinkman University of Michigan, GRIN
Don Nease University of Colorado, SNOCAP
Ken Toll United Way of Jackson County

WE have 4 goals for the session

- Demonstrate the importance of connecting community and medical information silos to support integrated health care
- Discuss the core principles of sociotechnical design as a framework to organize work on community health problems
- Draft a ‘methods toolbox’ to guide researchers and communities
- Build a collaborative community of researchers engaged in this type of work

Figure 1

Impact of Different Factors on Risk of Premature Death



SOURCE: Schroeder, SA. (2007). We Can Do Better — Improving the Health of the American People. *NEJM*. 357:1221-8.

COMMENTARY

Communities of Solution: Partnerships for Population Health

Kim S. Griswold, MD, MPH, Sarah E. Lesko, MD, MPH, and John M. Westfall, MD, MPH, for the Folsom Group

Communities of solution (COSs) are the key principle for improving population health. The 1967 Folsom Report explains that the COS concept arose from the recognition that complex political and administrative structures often hinder problem solving by creating barriers to communication and compromise. A 2012 reexamination of the Folsom Report resurrects the idea of the COS and presents 13 grand challenges that define the critical links among community, public health, and primary care and call for ongoing demonstrations of COSs grounded in patient-centered care. In this issue, examples of COSs from around the country demonstrate core principles and propose visions of the future. Essential themes of each COS are the crossing of "jurisdictional boundaries," community-led or -oriented initiatives, measurement of outcomes, and creating durable connections with public health. (J Am Board Fam Med 2013;26:232–238.)

Keywords: **Connecting Communities: Public and Personal Health**

Crossing of “jurisdictional boundaries”

Community-led or –oriented

Measurement of outcomes

Durable connections

Our approach

Create a ‘reference architecture’ including

human infrastructure + technical (IT) infrastructure

to support and sustain the Community of Solution approach.

People need to work with systems.

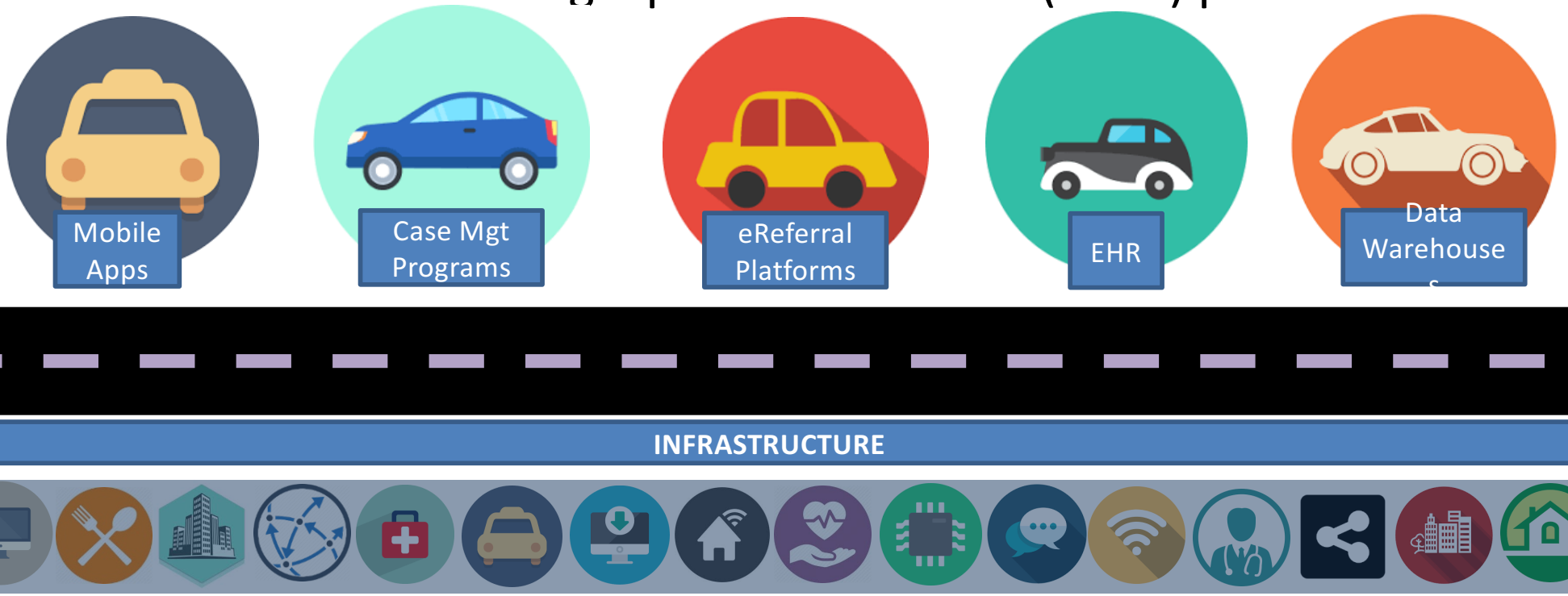
Systems need to serve people.

This probably requires durable partnerships between academic health centers (or CTSAs) and communities to overcome the ‘self-organizing’ problem.

The importance of technical (IT) infrastructure

Applications vs. Infrastructure

- Rather than focusing on fancy new IT solution for (one) problem
- Promote building a platform to solve (most) problems



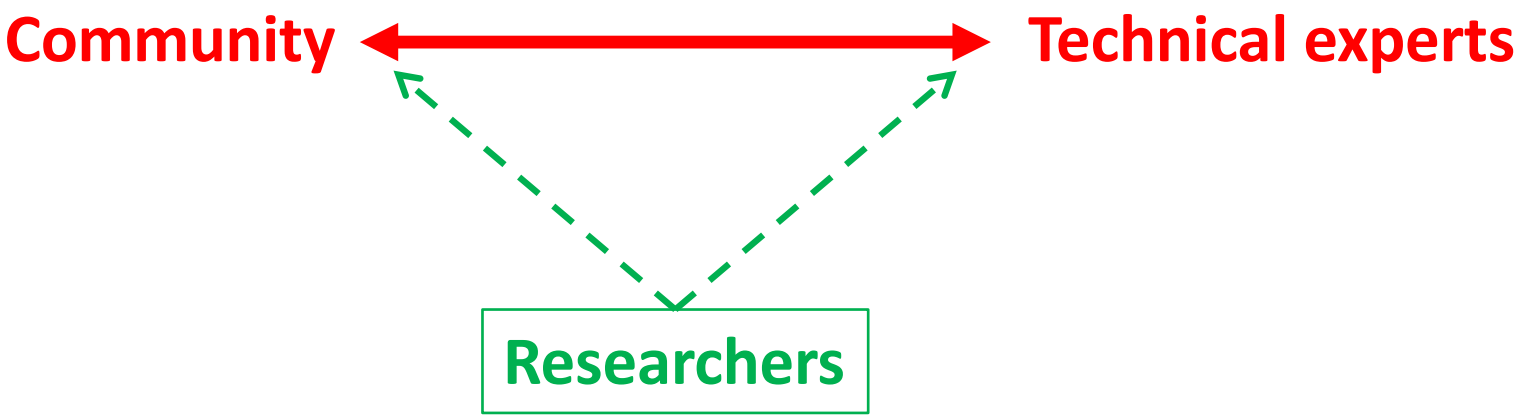
Socio-cultural View	*Individuals, values and principles.*	New meanings are negotiated.
Conversational View	*Roles, relationships and responsibilities.*	Meanings include Intentionality.
Informatics View	*Codes, terms and objects*	Meanings are predefined and concrete.
Engineering View	*Bits and terra-bytes channels and bandwidth*	Measurements but no meaning.

Views of Information.

Pairing human and technical infrastructures

Sociotechnical design:

A process by which social systems (communities) and technical experts co-create, co-design, and co-evolve technical solutions to problems affecting their systems



Concepts of opportunistic discovery and emergent communities

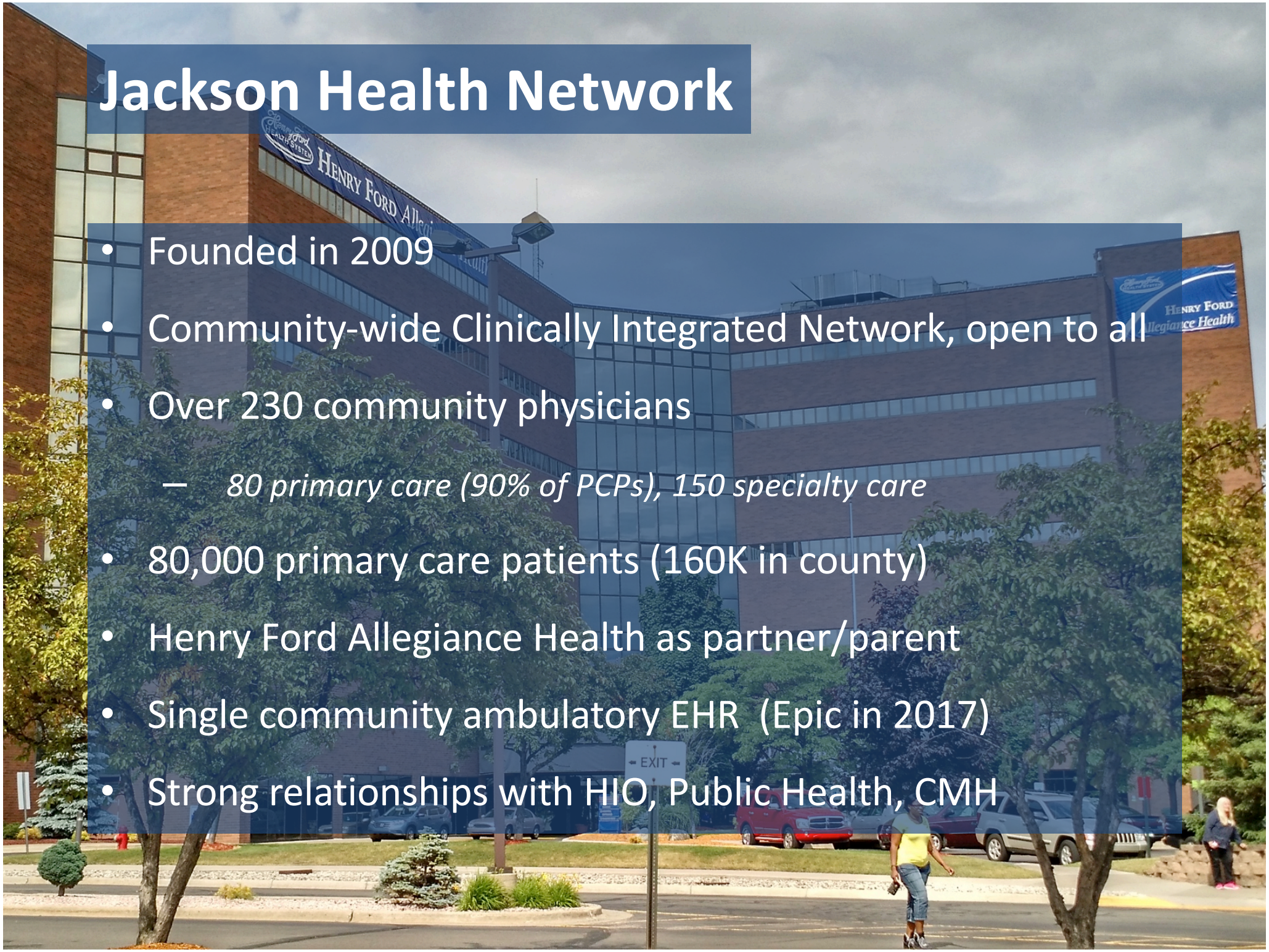
Issues of community resolve, stamina, and trust

Methods for community exploration, mapping, and activation

Giving up control -- MUTUALITY

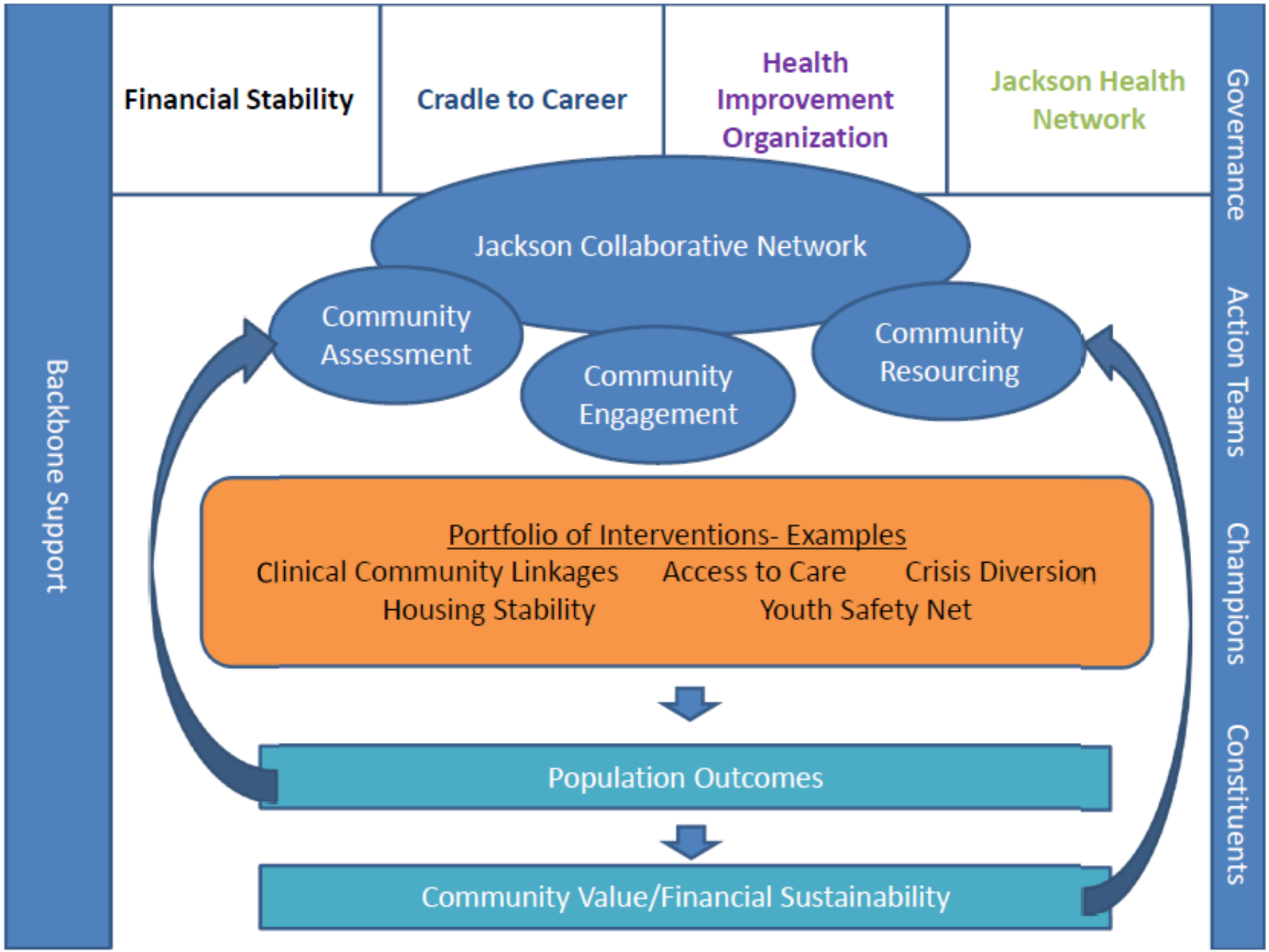

Jackson, Michigan
70 mi W of Detroit
1 city, 19 townships, 7 villages
County population: 160,248
City population: 33,534
11%+ unemployment rate
$47,424 median household income
1 in 3 with more than HS diploma
39% children insured by Medicaid
19% of children live in poverty
Mackinac Island
Manitoulin Island
Iron Mountain
Nicolet National Forest
Petoskey
Wausau
Traverse City
Huron National Forest
Green Bay
Appleton
Manistee National Forest
MICHIGAN
Muskegon
Grand Rapids
Flint
Holland
Lansing
Kenosha
Kalamazoo
Battle Creek
Ann Arbor
Detroit
Dearborn
Chatham-Kent
Chicago
Naperville
Google

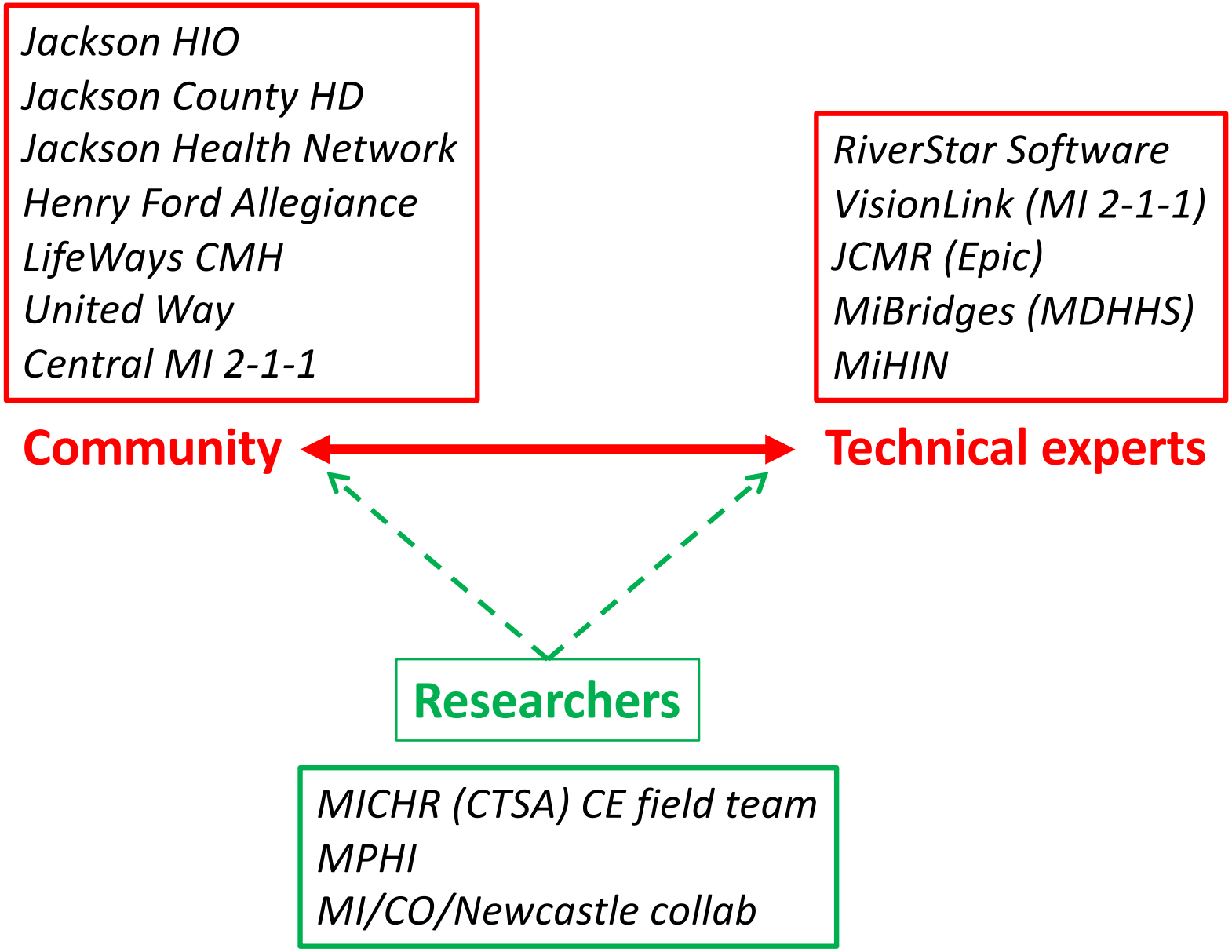
Jackson Health Network



- Founded in 2009
- Community-wide Clinically Integrated Network, open to all
- Over 230 community physicians
  - *80 primary care (90% of PCPs), 150 specialty care*
- 80,000 primary care patients (160K in county)
- Henry Ford Allegiance Health as partner/parent
- Single community ambulatory EHR (Epic in 2017)
- Strong relationships with HIO, Public Health, CMH

Jackson community stakeholders




Jackson HIO
Jackson County HD
Jackson Health Network
Henry Ford Allegiance
LifeWays CMH
United Way
Central MI 2-1-1
RiverStar Software
VisionLink (MI 2-1-1)
JCMR (Epic)
MiBridges (MDHHS)
MiHIN
Community
Technical experts
Researchers
MICHR (CTSA) CE field team
MPHI
MI/CO/Newcastle collab

Michigan Blueprint for Health

SIM Demonstration
2016-2020

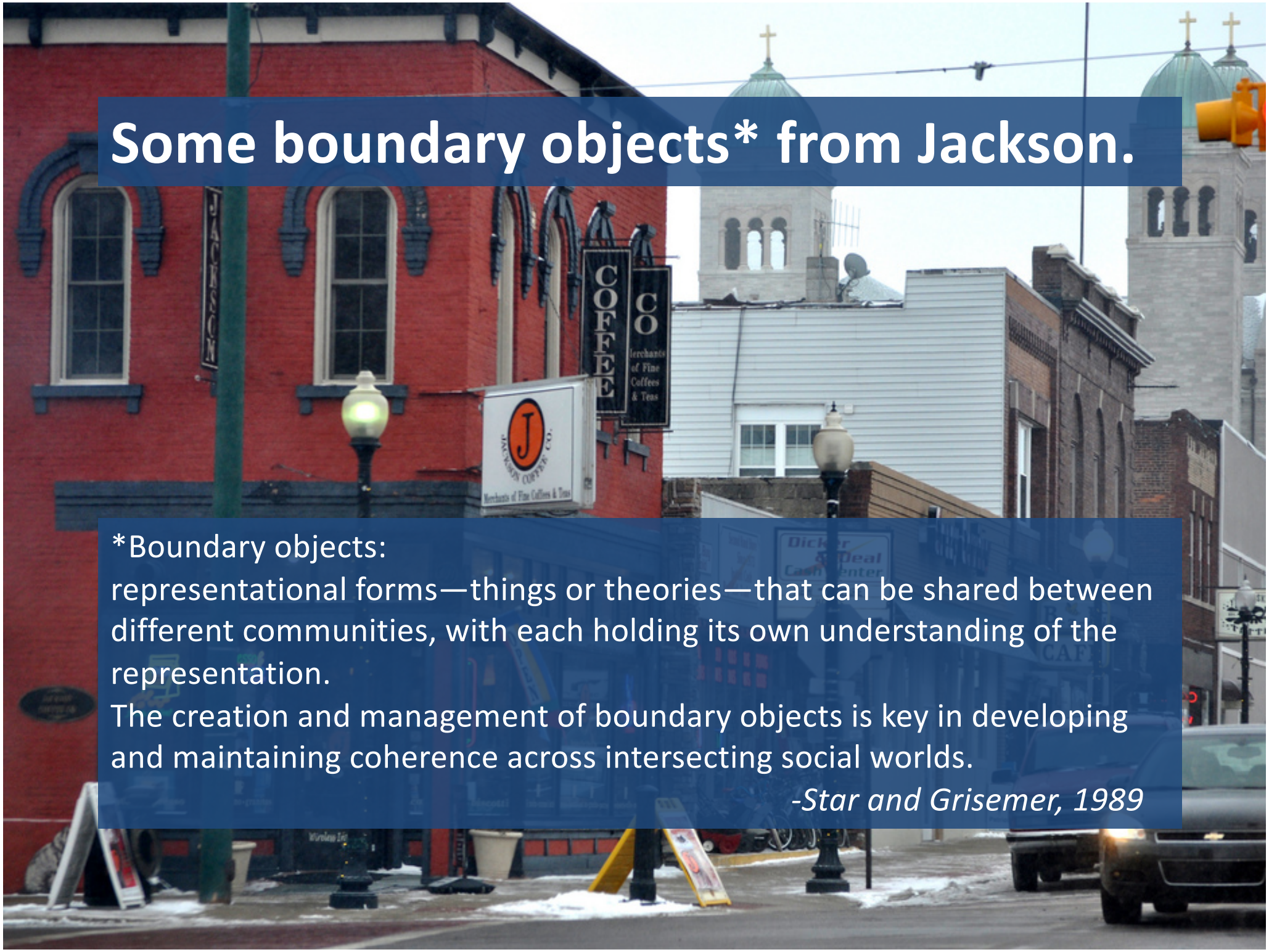
AIM: **Redesign health care delivery to integrate social services and medical care (and behavioral health care???) for at-risk population**

OVERALL DESIGN:

- ***Community Health Innovation Region (CHIR)***– backbone organization that convenes a governing body of community partners, including health systems, community based organizations, and governmental entities in a geographic region
- ***Accountable Systems of Care (ASCs)*** – organized clinical networks that provide and support medical services
- ***Patient-Centered Medical Homes*** – core of medical-side intervention
- ***Michigan Pathways to Better Health*** – Pathways community hub model for community service delivery, core of community-side intervention
- ***Payment Reform*** – to support and sustain redesigned care model

Community groundwork in Jackson

- Pre-work: action research
  - *Semi-structured interviews of lay community, stakeholders, providers, leaders*
- Creation of working group structure
  - *Collective Impact model extended to new participants, groups*
  - *Health Improvement Organization Coordinating Committee as lead*
- Clinical-Community Linkages core group
  - *Data/IT ad hoc group as lead*
  - *Convening community service agencies*
  - ***Co-design of care model, infrastructure, and core application(s)***
- Large-scale conversations across domains
  - *Governance, stewardship, sustainability*

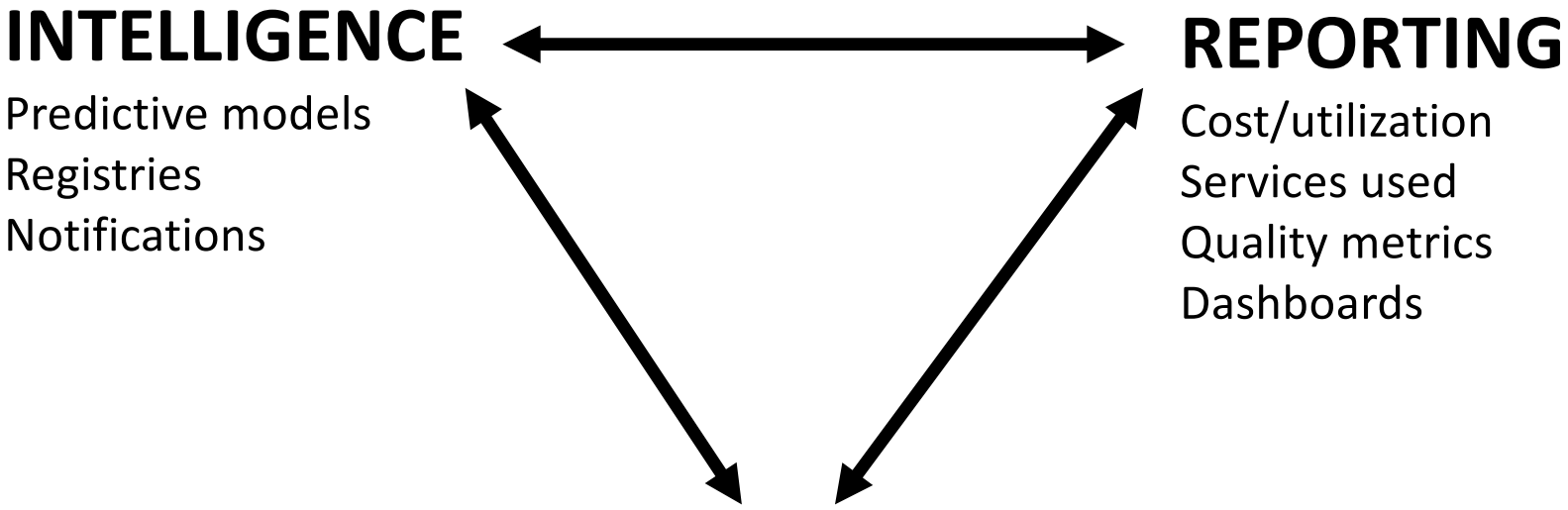


Some boundary objects* from Jackson.

*Boundary objects:
representational forms—things or theories—that can be shared between different communities, with each holding its own understanding of the representation.
The creation and management of boundary objects is key in developing and maintaining coherence across intersecting social worlds.

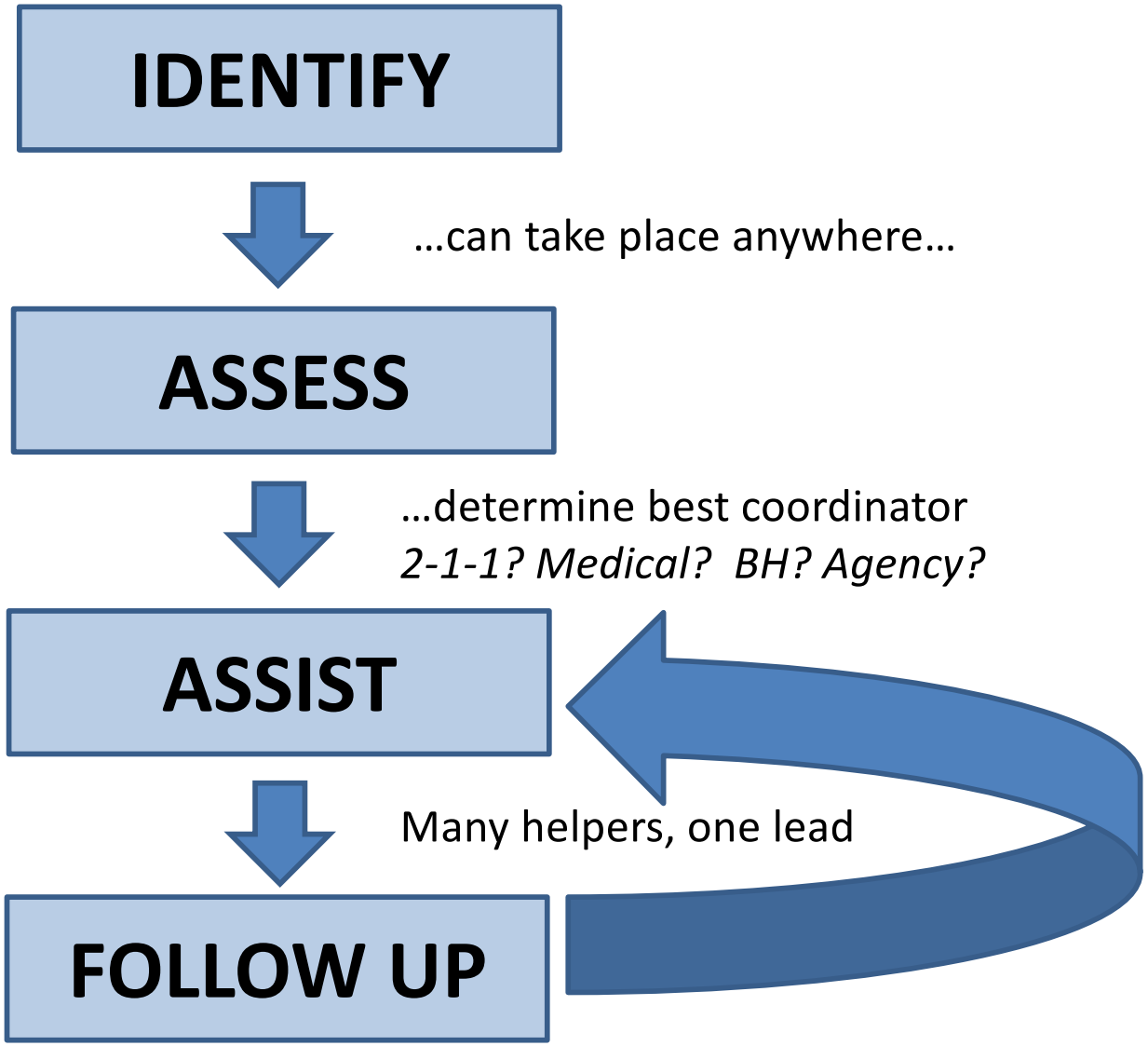
-Star and Grisemer, 1989

3 core IT functions for community information exchange



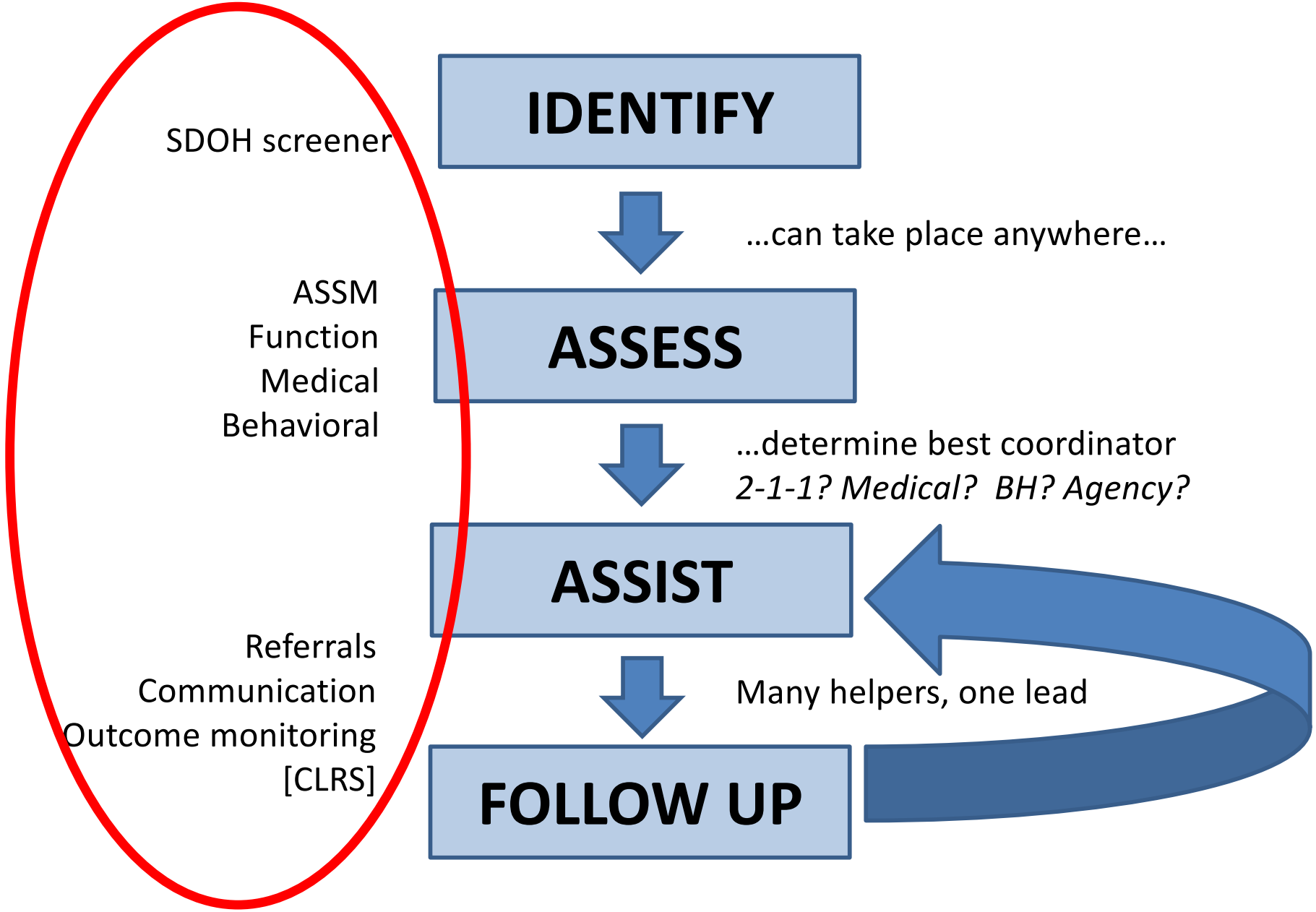
Community care model

[Work of the Care Model ad hoc group]



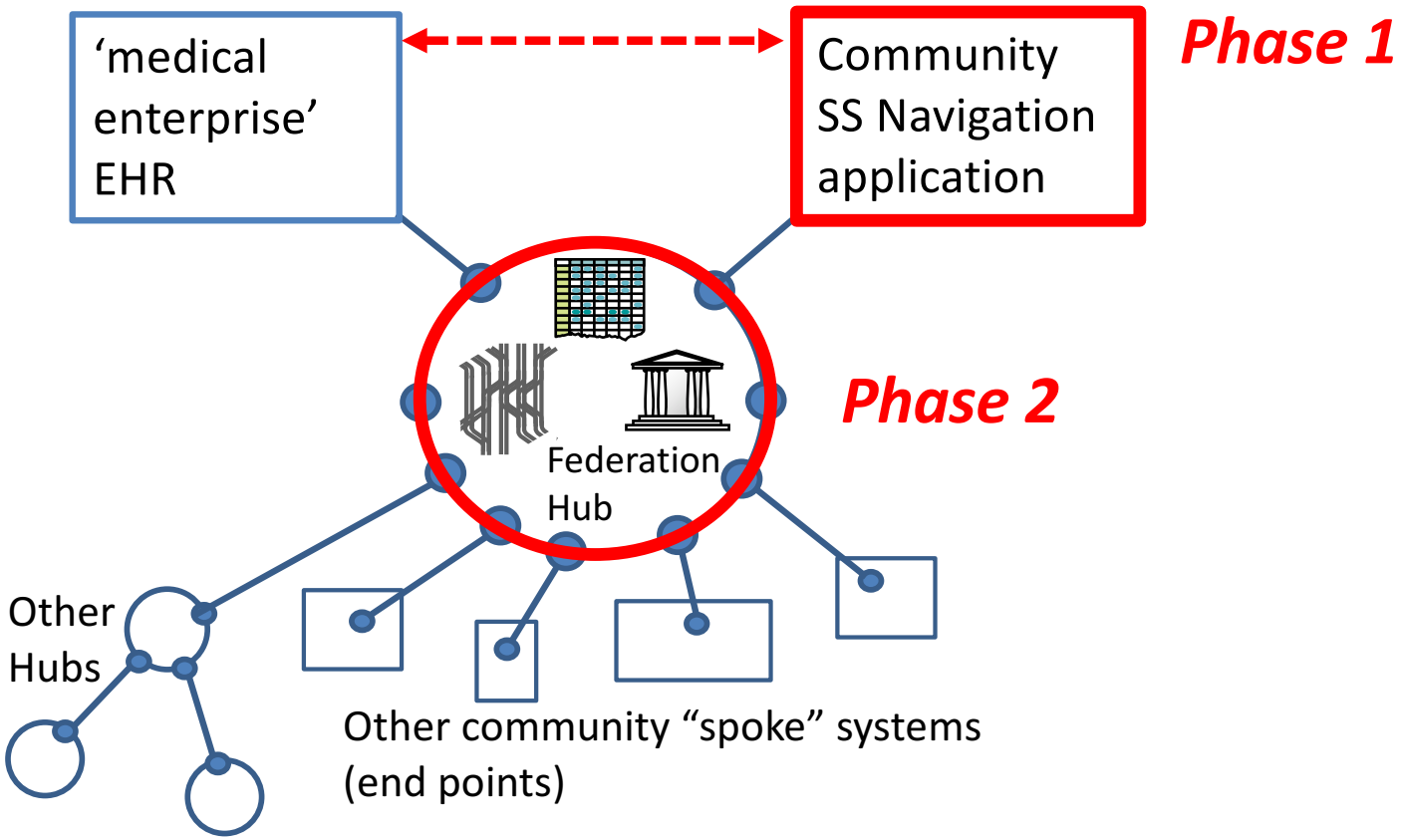
Community care model

[Work of the Pilot Agency and Data/IT ad hoc groups]

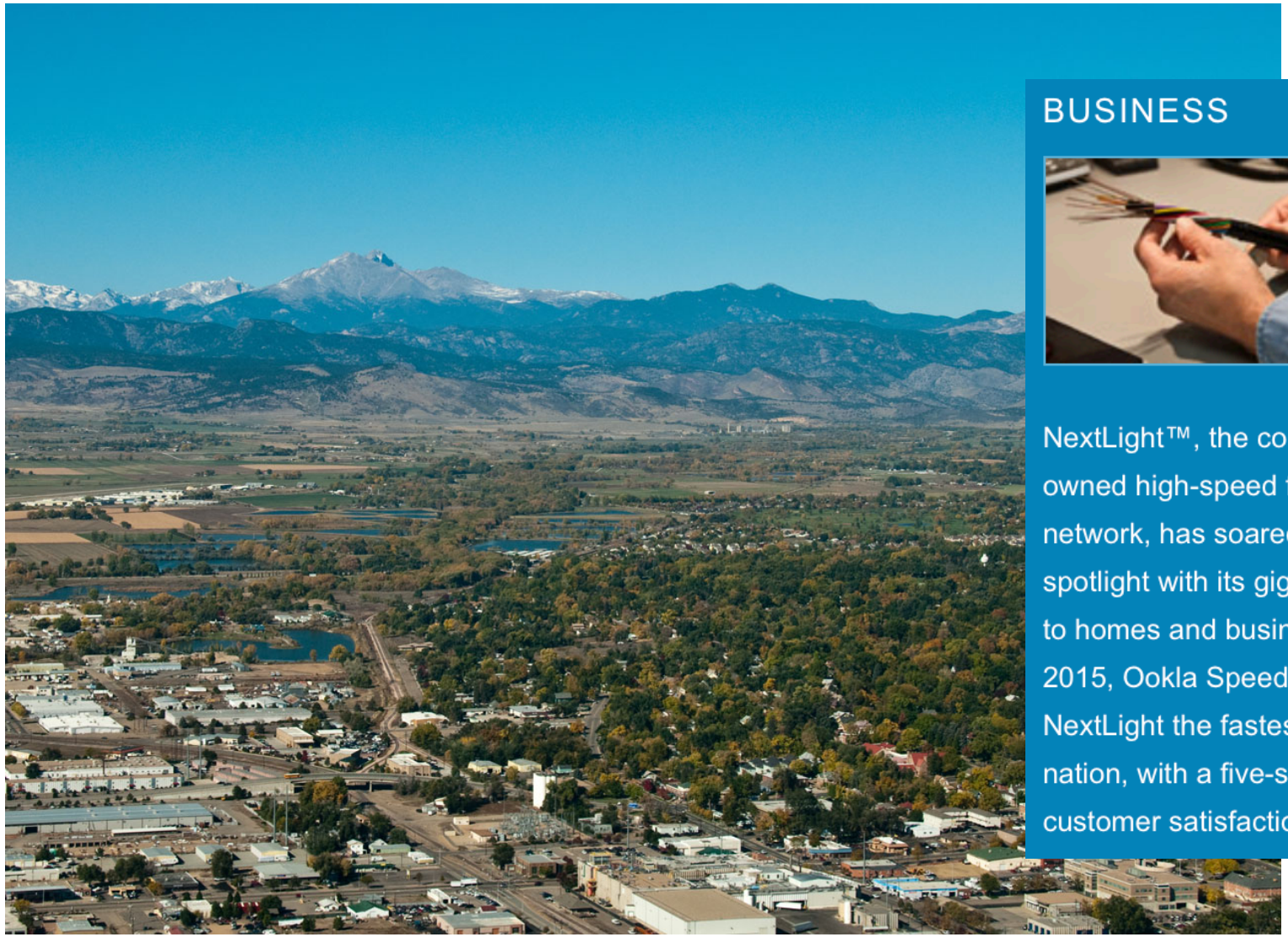


High-level view: Jackson Community Hub

[Work of the Data/IT ad hoc group, collaborating with IT partners]



Longmont, CO – 4984 ft, pop. 86,270



BUSINESS

NextLight™, the community-owned high-speed fiber-optic network, has soared into the spotlight with its gigabit service to homes and businesses. In 2015, Ookla Speedtest named NextLight the fastest ISP in the nation, with a five-star customer satisfaction rating.

Longmont, CO

37mi N of Denver

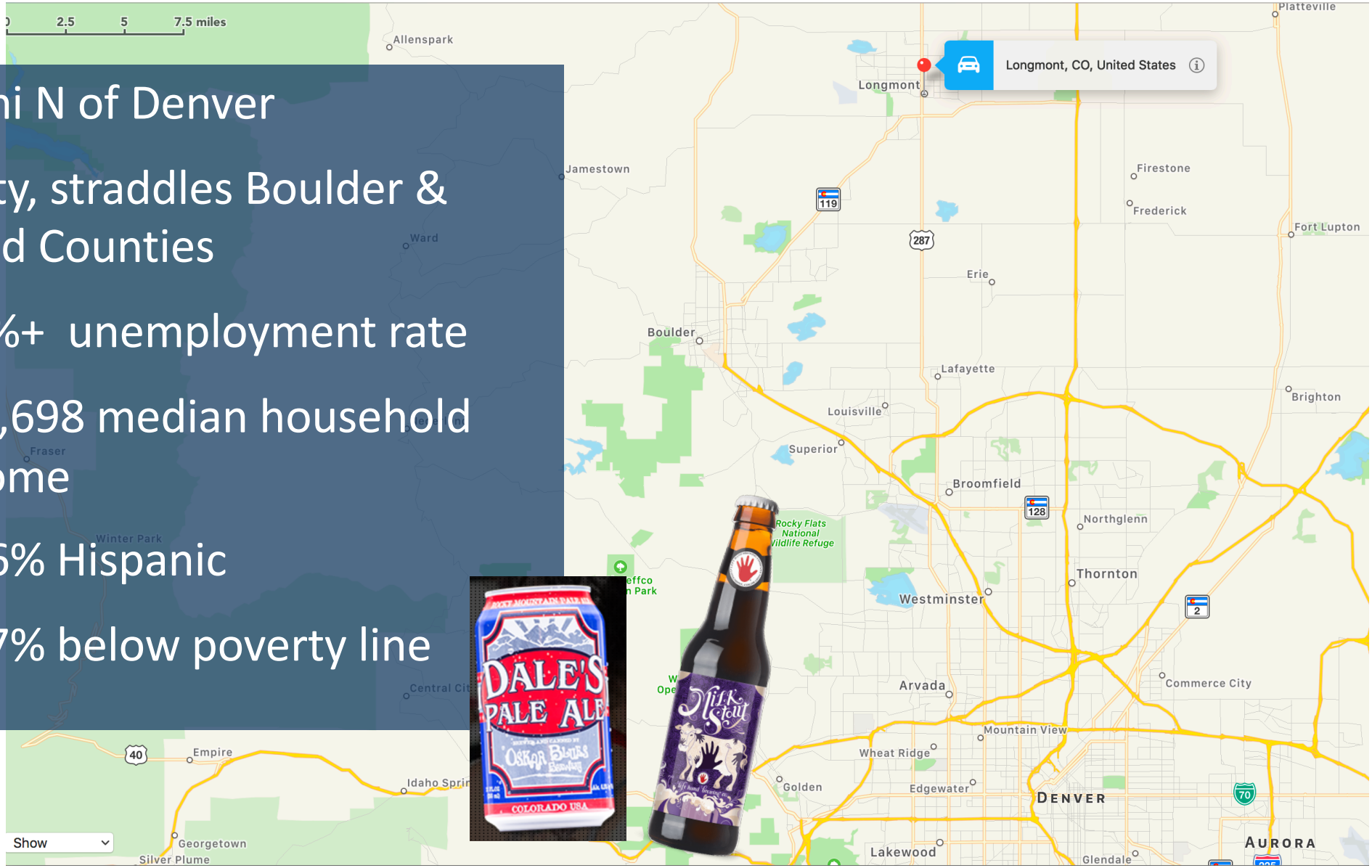
1 city, straddles Boulder & Weld Counties

2.1%+ unemployment rate

$58,698 median household income

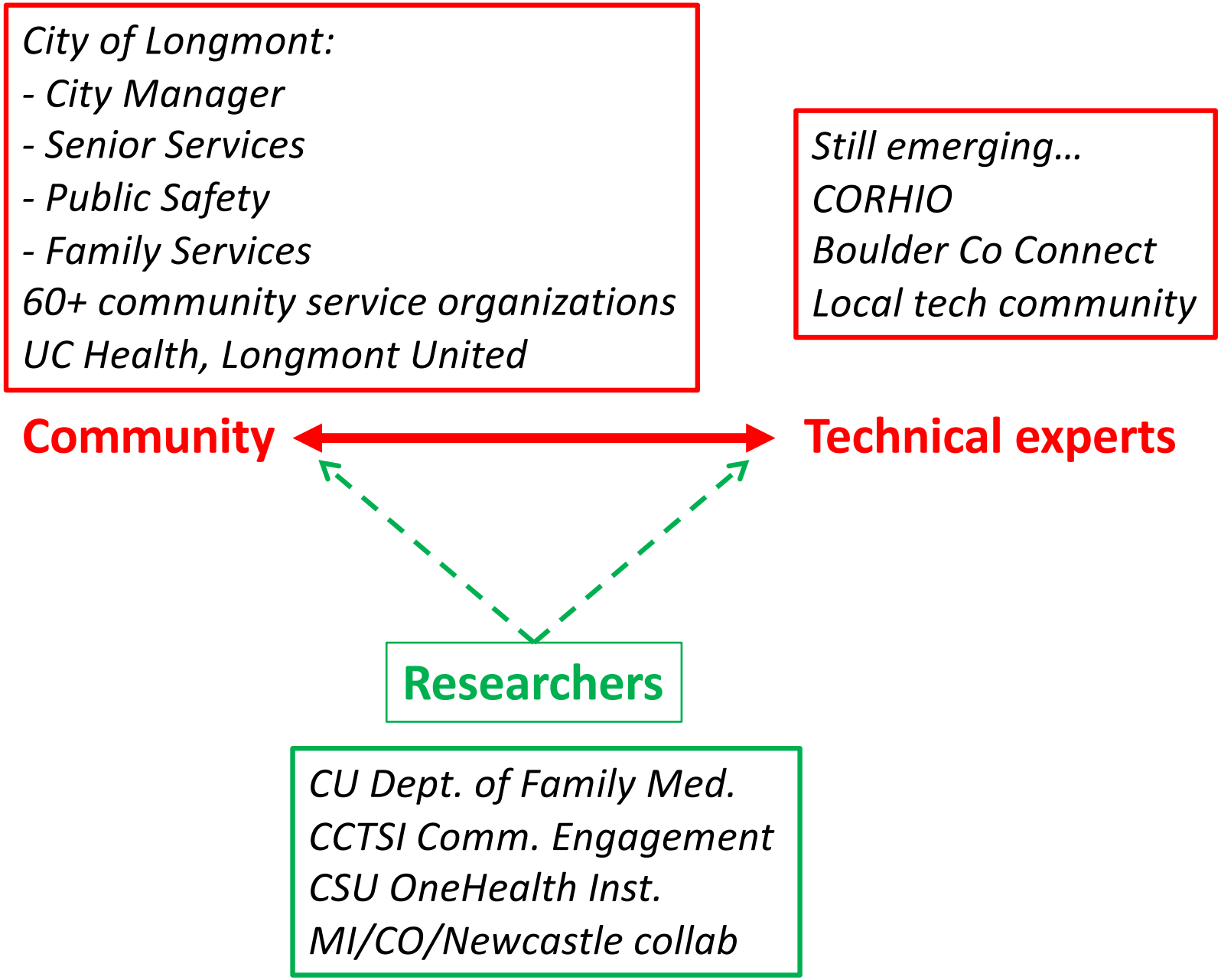
24.6% Hispanic

14.7% below poverty line



Longmont partners – so far…

- city partners include:
  - City Manager
  - Senior Services
  - Public Safety
  - IT department

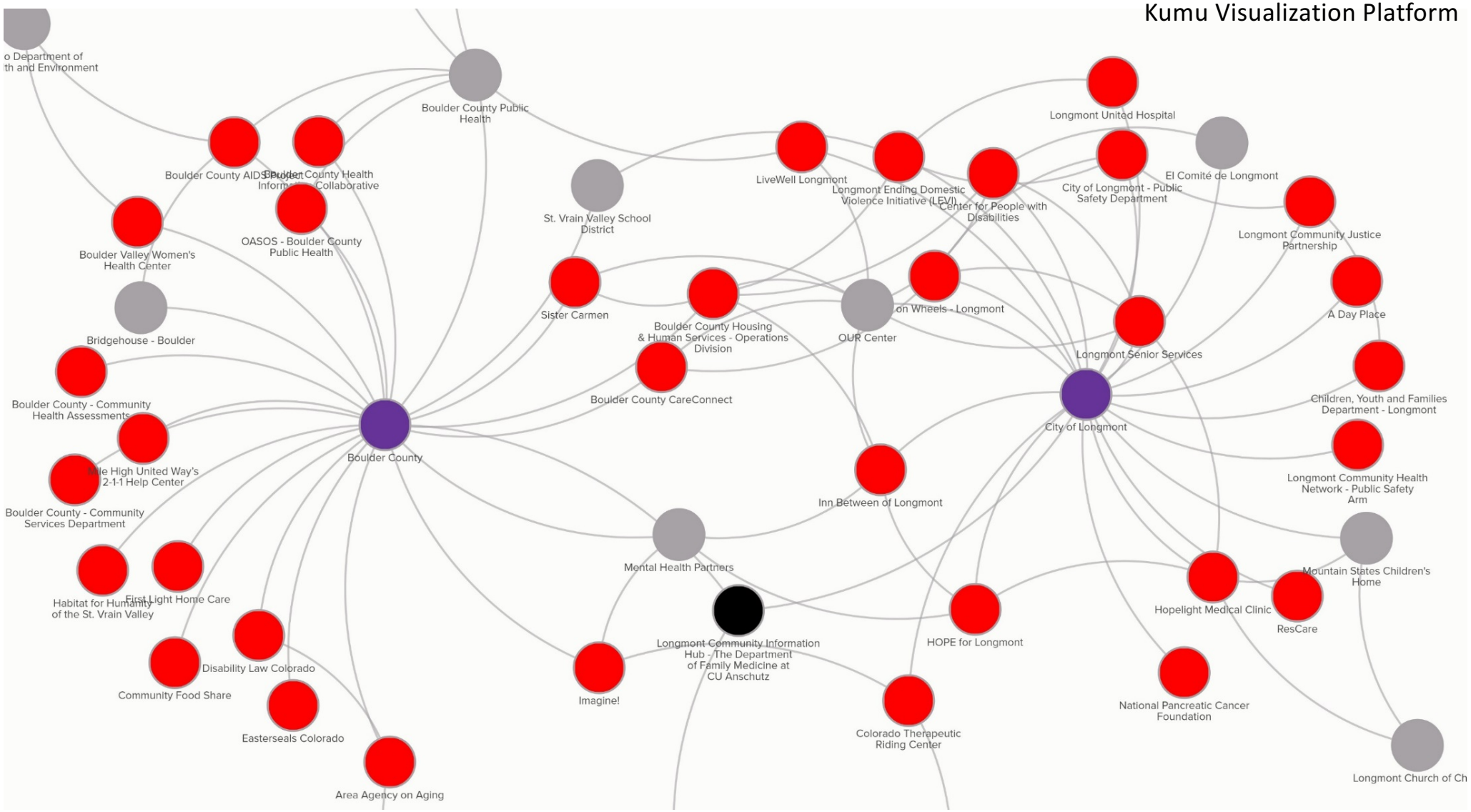

City of Longmont:
- City Manager
- Senior Services
- Public Safety
- Family Services
60+ community service organizations
UC Health, Longmont United
Still emerging…
CORHIO
Boulder Co Connect
Local tech community
Community
Technical experts
Researchers
CU Dept. of Family Med.
CCTSI Comm. Engagement
CSU OneHealth Inst.
MI/CO/Newcastle collab

Longmont steps to date…

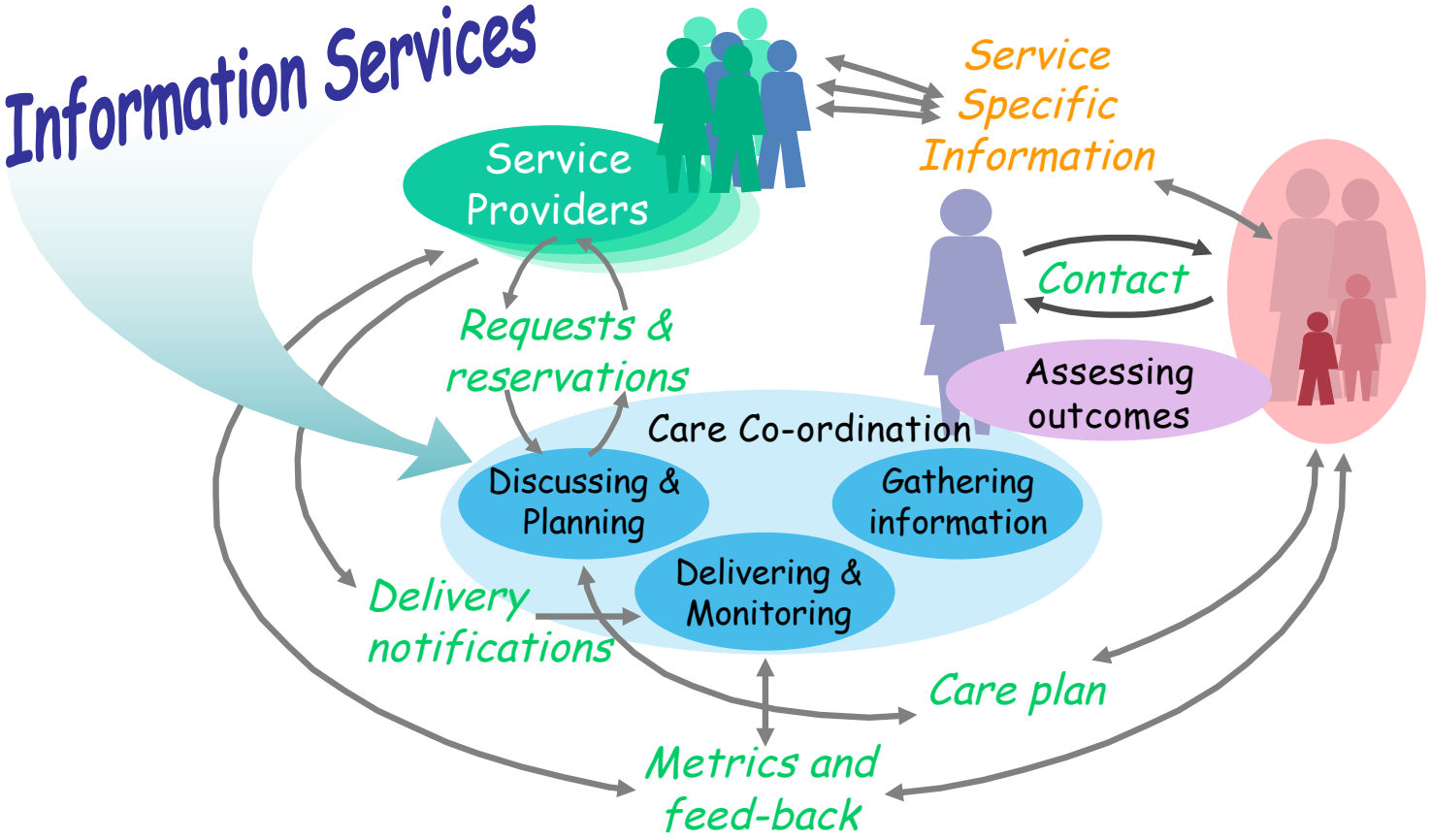
- Invitation by city and new UC Health CEO
- initial meet & greet
- presentation of vision to <25 stakeholders
- meeting with key partners to lay out initial steps
- beginning community resource mapping
- NSF funding application
- planning to engage local tech community

Some boundary objects from Longmont

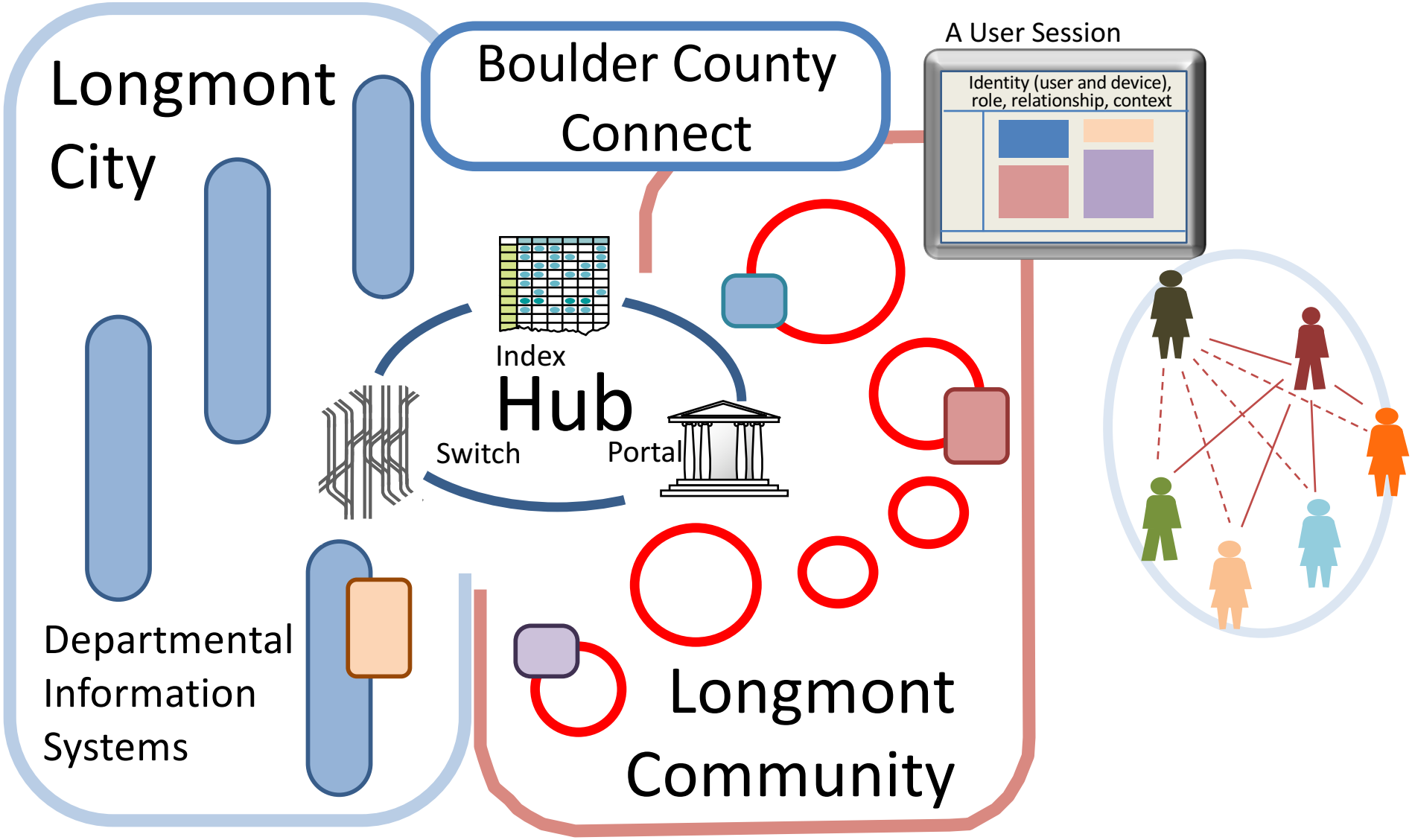
Kumu Visualization Platform

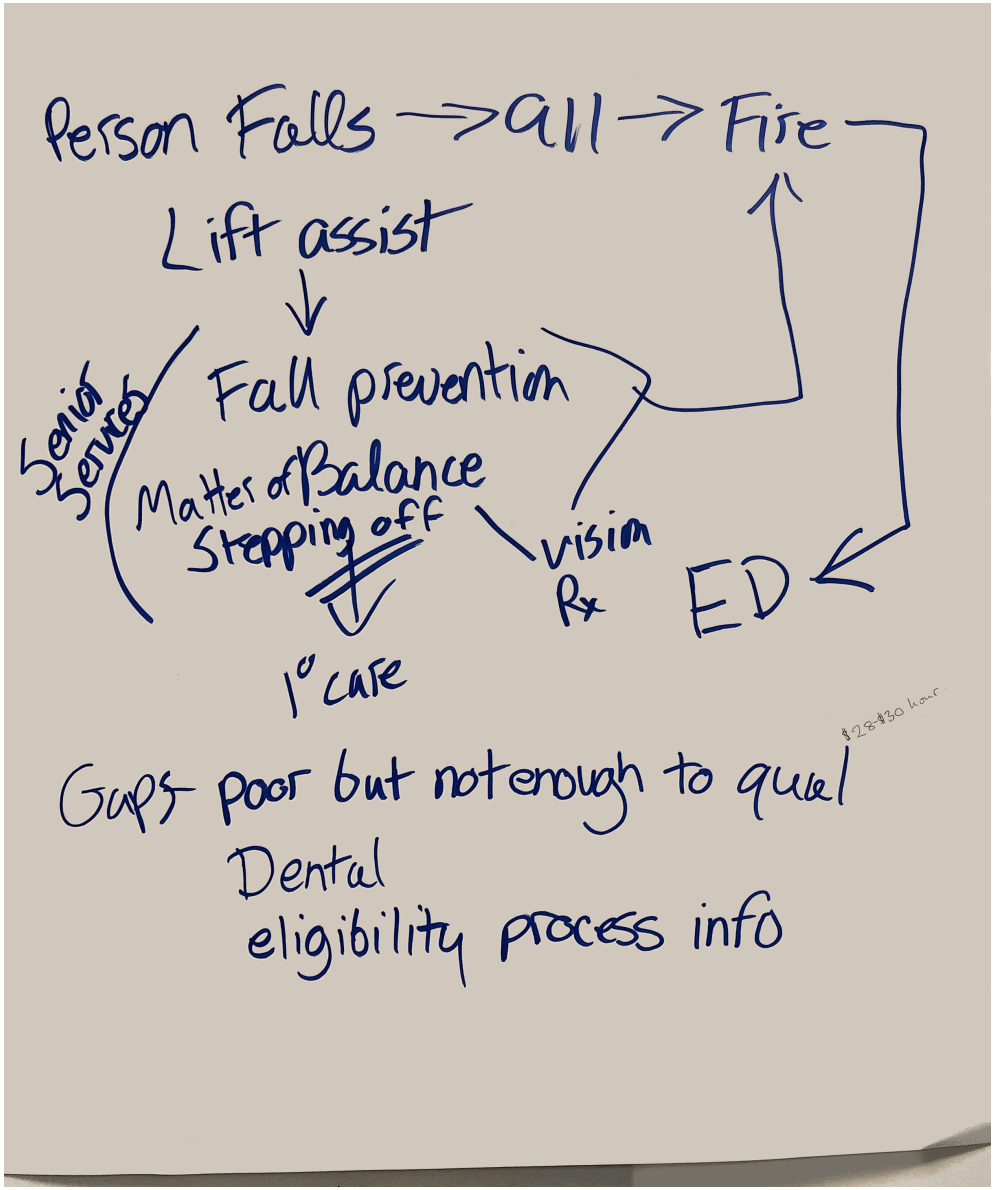


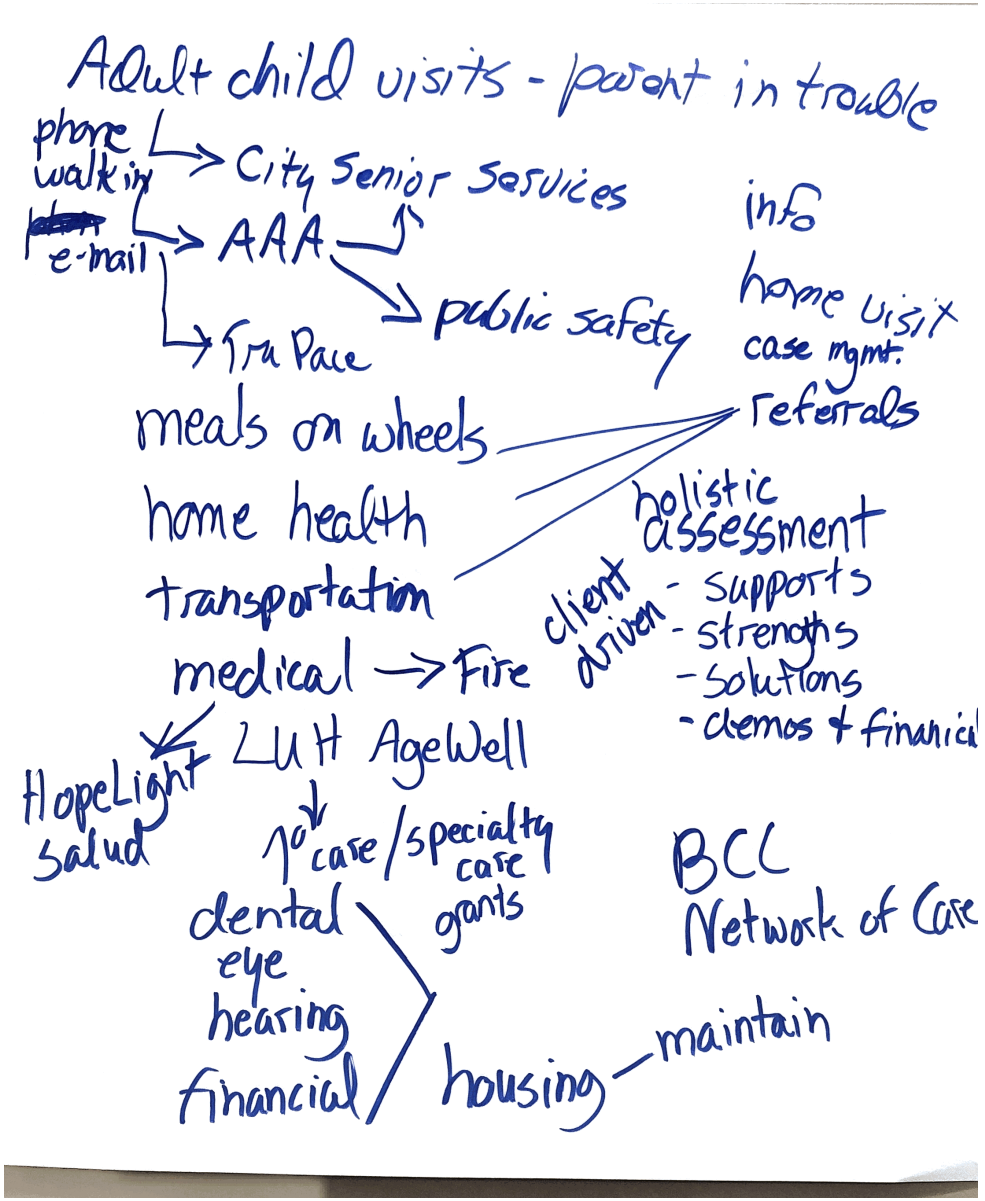
mike.martin@ncl.ac.uk
Newcastle University Business School



Conversations of care


Longmont City
Boulder County Connect
A User Session
Identity (user and device), role, relationship, context
Index
Hub
Switch
Portal
Departmental Information Systems
Longmont Community


Person Falls → all → Fire
Lift assist
Senior Services
Fall prevention
Matter of Balance
Stepping off
vision
Rx
ED
1° care
$28-$30 hour
Gaps poor but not enough to qual
Dental
eligibility process info


Adult child visits - parent in trouble
phone
walk in
e-mail
City Senior Services
AAA
Tri Pace
public safety
info
home visit
case mgmt.
referrals
meals on wheels
home health
transportation
medical → Fire
holistic
assessment
client driven
- supports
- strengths
- solutions
- demos & financial
HopeLight Salud
LUH AgeWell
1° care/specialty care
grants
dental
eye
hearing
financial
housing
maintain
BCC
Network of Care

What does it take to do this stuff?

Is it even research??

Concepts of opportunistic discovery and emergent communities

Issues of community resolve, stamina, and trust

Methods for community exploration, mapping, and activation

Giving up control -- MUTUALITY

Some critical points along pathway

1. Community shared visioning (convening)

2. "All Aboard!" (who's in? who's out?)

   at this point, is there an emergent community?

3. Bringing in medical care delivery system(s)

   as partners, not as controllers

4. Bringing in IT suppliers – EHR, SS Nav

   to support co-designed care model and workflow

5. Developing governance structure and ownership

Sociotechnical design staff roles (idealized!)

- **Project coordinator: 1.0 FTE.** Manages all operational elements
- **Community stakeholder liaison: 0.5-1.0 FTE.** primary link to main formal community stakeholders
- **Clinical liaison: 0.5-1.0 FTE.** primary link to medical and behavioral health care establishment.
- **Community liaison: 1.0 FTE.** primary link to the community at-large, including community 'attractors' and informal care networks
- **Ethnographer/Scribe: 1.0-2.0 FTE**. carries out qualitative/observational work to tell the story of how the project unfolds (descriptive), and to capture perceptions/ preferences/ responses/ reactions of community members
- **Administrative coordinator: 1.0 FTE**.

Research partnership issues

- Research impact on practices and community must be carefully assessed
- Local CoI (if not PI) on projects
- Need local Federal grants management capacity
- IRB reciprocity/delegation?
- Formal MOU or contract – pros and cons
- Research culture vs. local culture
- Research speed vs. business speed

Jackson Practice and Community RDC, 2015-6

Oversight and review of all proposed JHN and community research

- Projects introduced through respective representative
- Reviewed for feasibility, merit, alignment with community priorities
- Feedback and revision(s) if needed
- Assists with IRB, community and practice interfaces as needed

Review team for community-based proposals

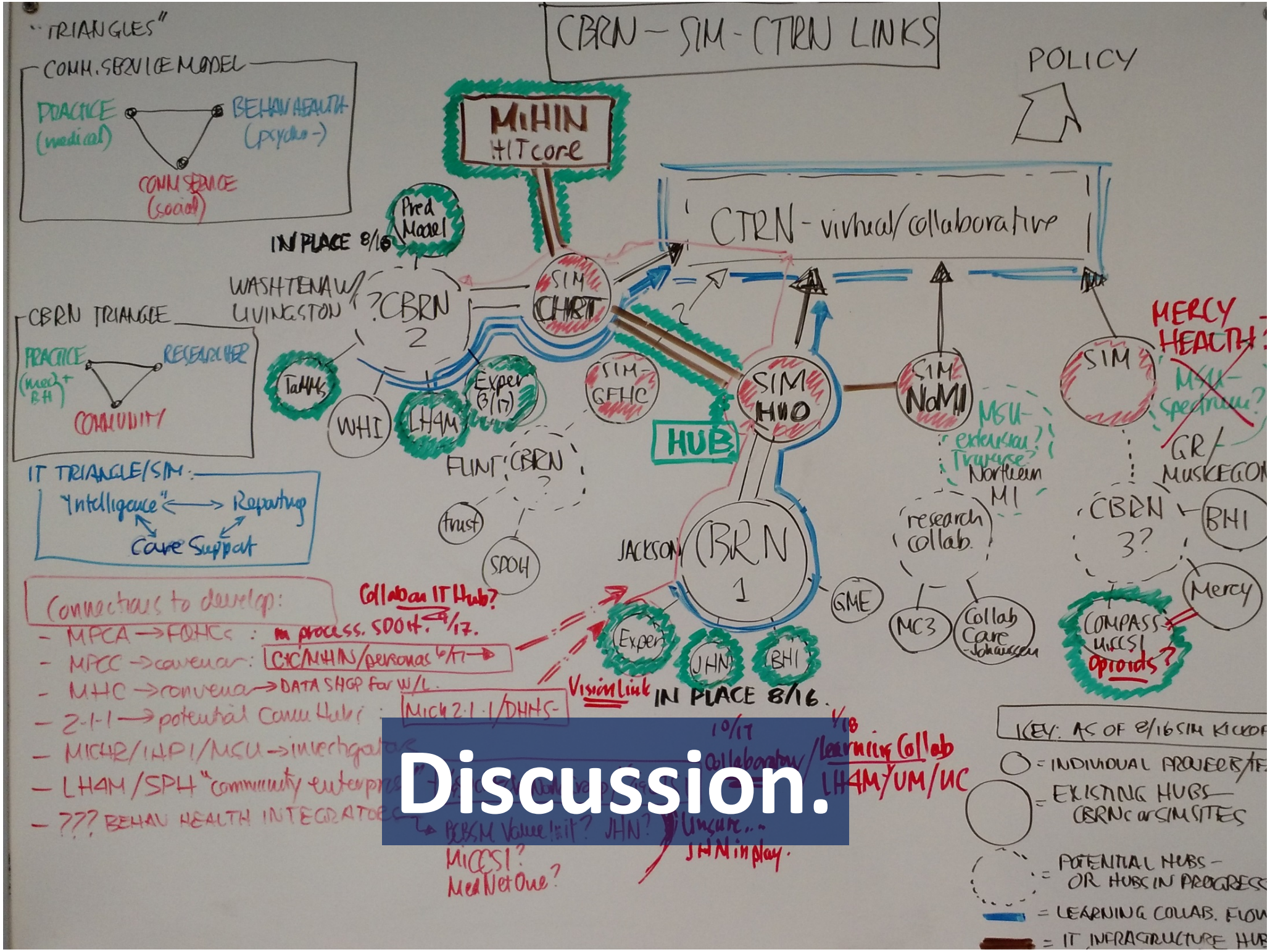
Jackson Health Network
~~Paula Phieley~~, Mike Klinkman

Jackson County Health Dept
Richard Thoune

Health Improvement Org
~~Elisabeth Cross~~

MICHR
~~Leslie Paulson~~

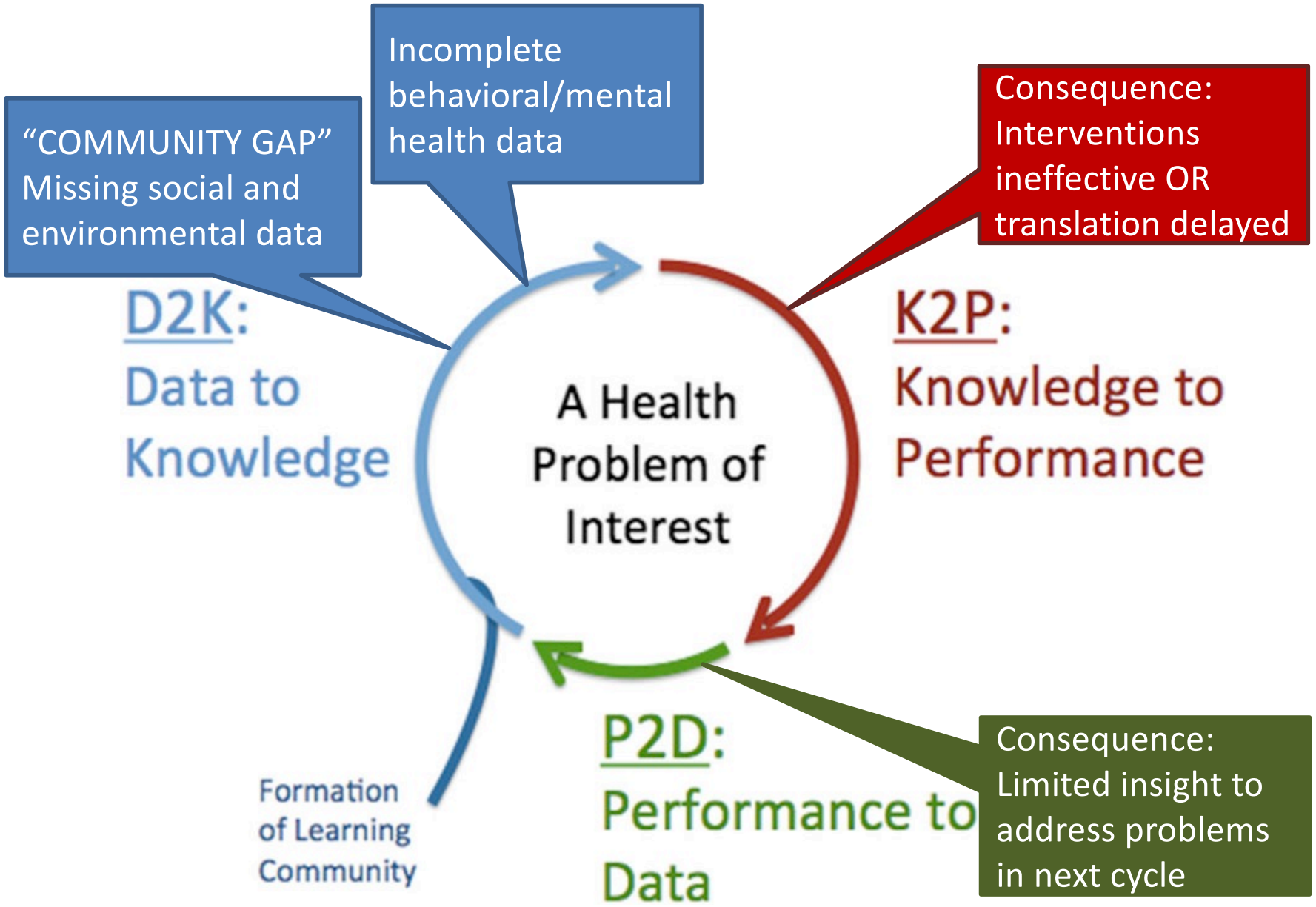
Research and Sponsored Programs
~~Al Phieley~~


"TRIANGLES"
COMM. SERVICE MODEL
PRACTICE (medical)
BEHAV HEALTH (psycho-)
COMM SERVICE (social)
CBRN TRIANGLE
PRACTICE
RESEARCHER
COMMUNITY
IT TRIANGLE/SIM:
"Intelligence"
Reporting
Care Support
CBRN – SIM – CTRN LINKS
MiHIN HIT core
POLICY
CTRN - virtual/collaborative
IN PLACE 8/16
Pred Model
WASHTENAW/ LIVINGSTON
?CBRN 2
SIM CHRT
SIM GFHC
SIM HHO
SIM NoMI
SIM
MERCY HEALTH?
HUB
TaHHS
WHI
LHAM
Exper B/17
FLINT CBRN ?
trust
SDOH
JACKSON
CBRN 1
GME
MSU- external? Traverse? Northern MI
research collab.
MC3
Collab Care Johanssen
CBRN 3?
BHI
Mercy
COMPASS MiCCS1 opioids?
GR/ MUSKEGON
Connections to develop:
- MPCA → FQHCs : in process. SDOH 4/17.
- MPCC → convene: CIC/MHIN/personas 6/17
- MHC → convene → DATA SHOP for W/L.
- 2-1-1 → potential Comm Hub:
- MICHR/IHPI/MSU → investigators
- LHAM/SPH "community enterprise"
- ??? BEHAV HEALTH INTEGRATORS
Collaborative IT Hub?
MICH 2-1-1/DHHS-
VisionLink
Expert
JHN
BHI
IN PLACE 8/16.
10/17 Collaborative
1/18 Learning Collab LHAM/UM/UC
BCBSM Value?
MICCS1?
MedNetOne?
JHN?
Unsure... JHN in play.
KEY: AS OF 8/16 SIM KICKOFF
= INDIVIDUAL PROVIDER/PRACTICE
= EXISTING HUBS – CBRNs or SIM SITES
= POTENTIAL HUBS – OR HUBS IN PROGRESS
= LEARNING COLLAB. FLOW
= IT INFRASTRUCTURE HUB

Discussion.

Ambitious stuff in development.

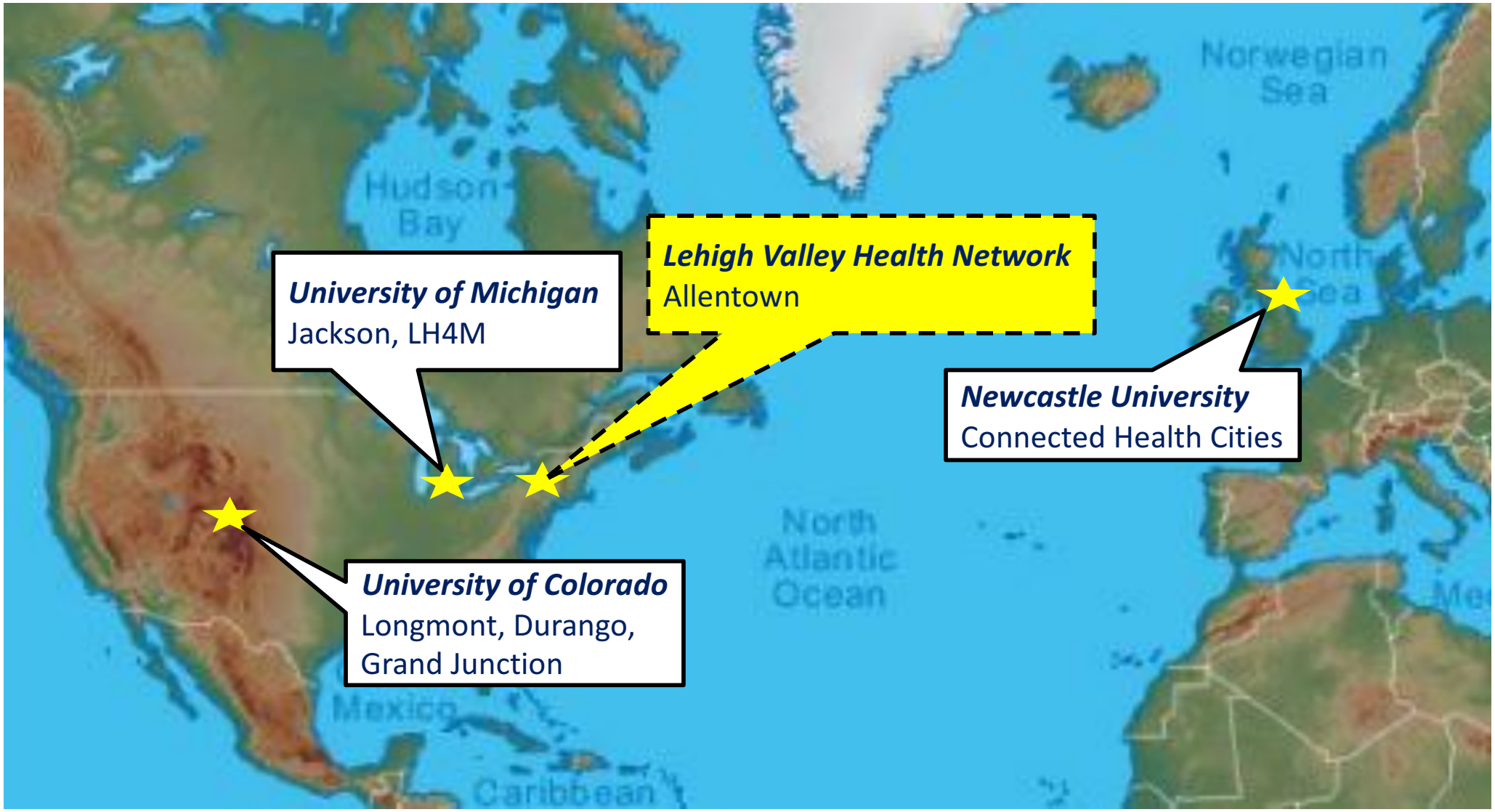
For many health problems of interest to communities, biomedical data alone is insufficient to create a learning health cycle.


Incomplete behavioral/mental health data
"COMMUNITY GAP" Missing social and environmental data
Consequence: Interventions ineffective OR translation delayed
D2K: Data to Knowledge
K2P: Knowledge to Performance
A Health Problem of Interest
P2D: Performance to Data
Consequence: Limited insight to address problems in next cycle
Formation of Learning Community

We propose to develop, implement, and evaluate a **Community-based Learning Health System (CLHS)** that will capture and link information gathered locally in the course of care for biomedical, behavioral, and social needs to close the 'community gap' in our LHS evidence base and enhance community engagement in improving translation.

SURVEILLANCE + *Local effector arm*

Community Health IT Infrastructure collaborative



Local partners in collaborative

Michigan	Colorado	Newcastle
University – Dept LHS		University – NUBS
CTSA – MICHR	CTSA - CCTSI	NHS – Connected Cities
MiHIN	QHN, CORHIO	
	Longmont city government	Newcastle city government
Jackson community	Longmont, Grand Junction, Durango communities	Newcastle region
Henry Ford Allegiance Health/JHN	UC Health	NHS regional trust, Newcastle Hospital
(MDHHS) (SIM)		
Michigan 2-1-1		*(social care trust)*
RiverStar (IT hub) VisionLink (2-1-1)	NextLight (fiber) *(Boulder Co Connect)*	Tiani Spirit (hub?) Virgin Media (fiber)

Current work of the collaborative:

- Methods development and inventory
- Community meetings
  (The Grand Tour 12/17; 5/18; 7/18)
- Field manual
- Writing narratives for each site
- Supporting new groups
- Exploring funding options

LH4M proposal (MI)
Colorado Health Foundation (UC)
CTSA Admin supp (UC and UM)
Pool Trust (learning collaborative)

Basic IT 'tools' used in CARE SUPPORT design

Tool	Description	Purpose	Issues
HD	Health directory [MiHIN]	Establish user credentials	
Common Key	Unique patient identifier [MiHIN]	Ensure data correctly linked to individual	
ACRS	Active Care Relationship Service [MiHIN]	Confirm membership in care team and allow access to individual's record	Need expansion to cover CSA staff, others
ADT	Admit/Discharge/ Transfer notification [MiHIN]	Confirm that an 'event' occurred	Expand to cover all interactions (visits, calls, referrals, services)
CCDA	Consolidated Clinical Document Architecture	Specifies encoding, structure and semantics of clinical documents for exchange between EHR and Hub (HL7 standard, uses XML)	Need to create CCDs containing SDOH and referral data
SDOH	*SDOH screening instrument*	*Identify individual's SDOH needs by domain*	*Standardization VERY difficult*

IT components and vendor partners

Michigan 2-1-1 database [VisionLink]
Indexed database of CSAs retrievable using taxonomy terms

Community SS navigation platform [RiverStar]
SDOH screening and assessment tool (homegrown) linked to Arizona Self-Sufficiency Matrix scoring, communications function, closed-loop referral function, outcomes monitoring *(in development)*

Community IT Hub [RiverStar] *(in development)*
Enables data exchange between SS Nav and JCMR
Enables other local CSA IT platforms to exchange data across Hub

Jackson Community Medical Record [Epic]
RiverStar SDOH screening and assessment tool mirrored in Epic

MI Bridges [MDHHS]
Data exchange across Hub *(in development)*

A COMMUNITY INFORMATION EXCHANGE

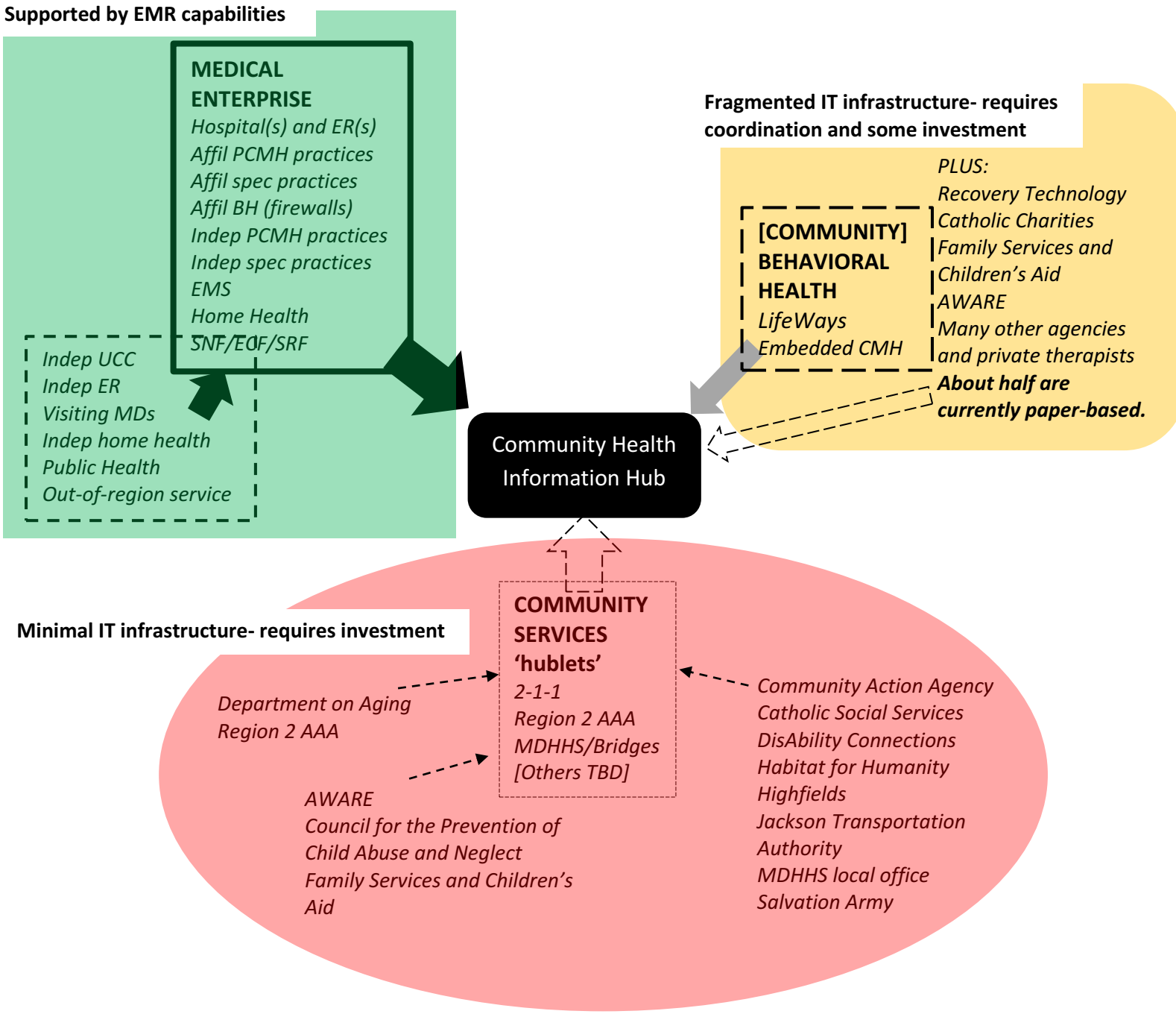
Brings together multiple community (social) service stakeholders to follow the same general care model and to share a connecting IT infrastructure

…that supplements their own IT
…that uses common assessment tools
…that has a single connecting point to the medical enterprise

That they co-create and co-govern

That is a partner to, not owned by, the medical enterprise

FIGURE: INTEGRATED CARE TRIANGLE and the COMMUNITY HEALTH INFORMATION HUB

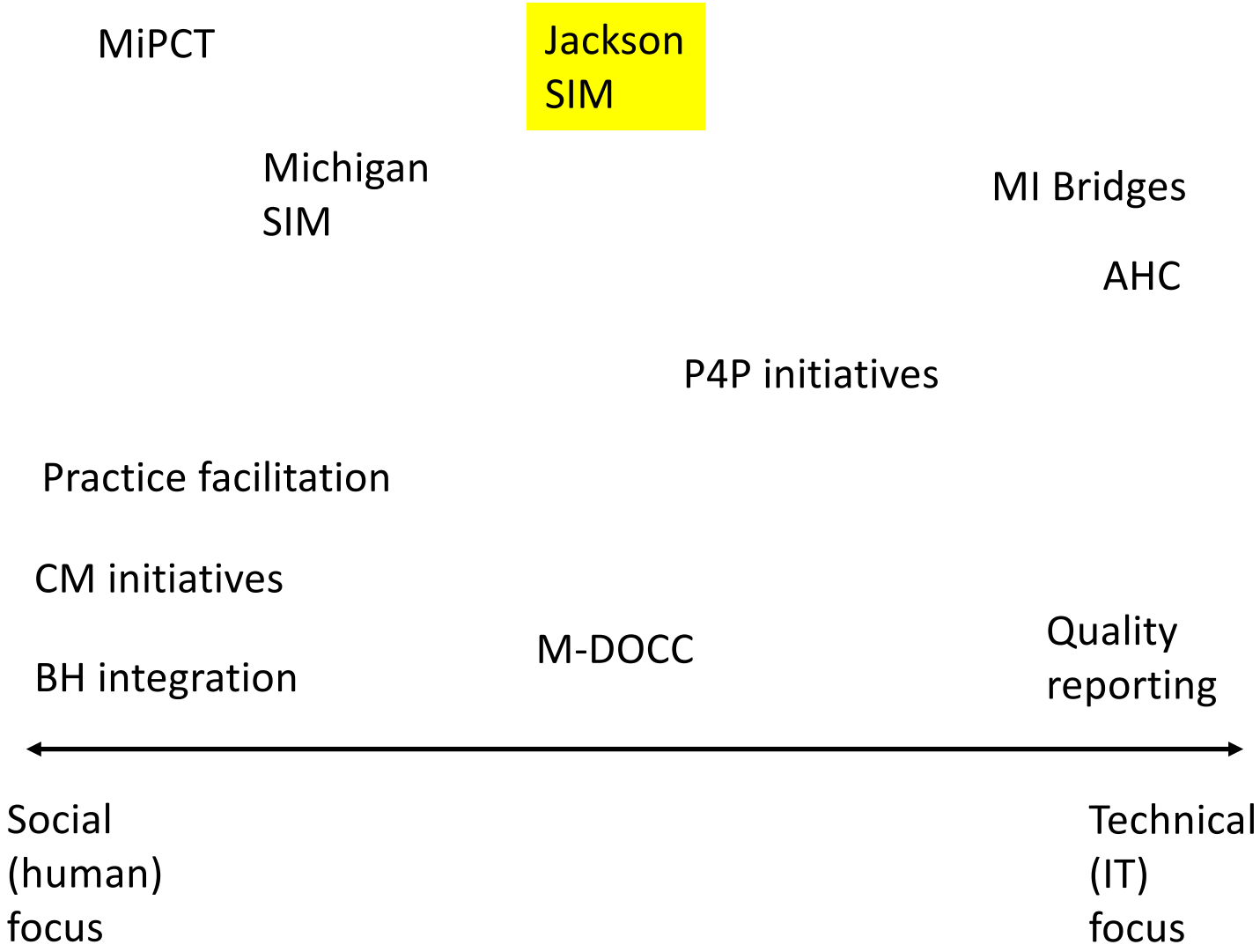


Jackson County State Innovation Model demonstration

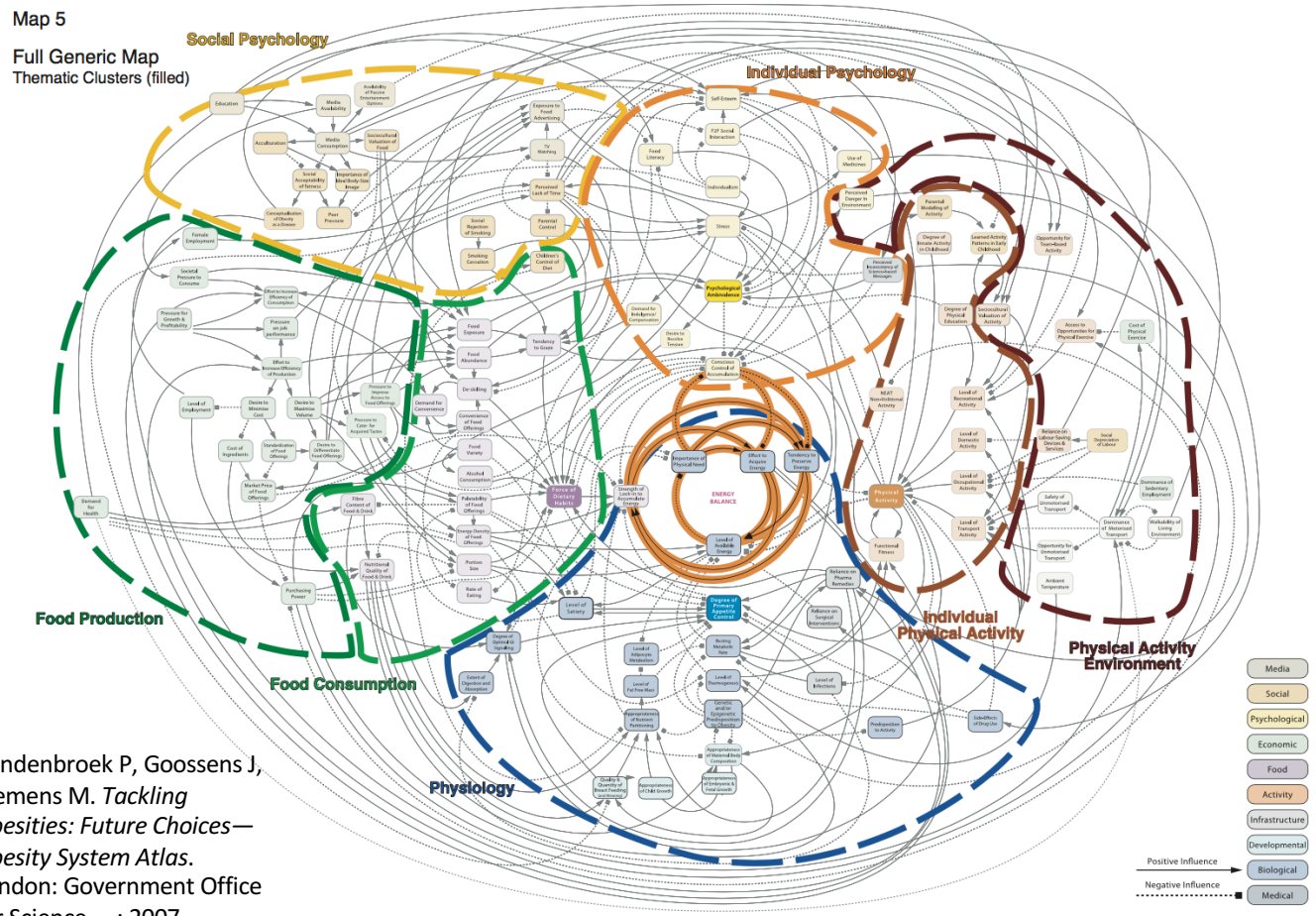
Concept model for Community Health Information Hub

January 2017

Work to date – primarily human infrastructure



medicine alone is not enough…



Vandenbroek P, Goossens J, Clemens M. *Tackling Obesities: Future Choices—Obesity System Atlas.* London: Government Office for Science. …; 2007.

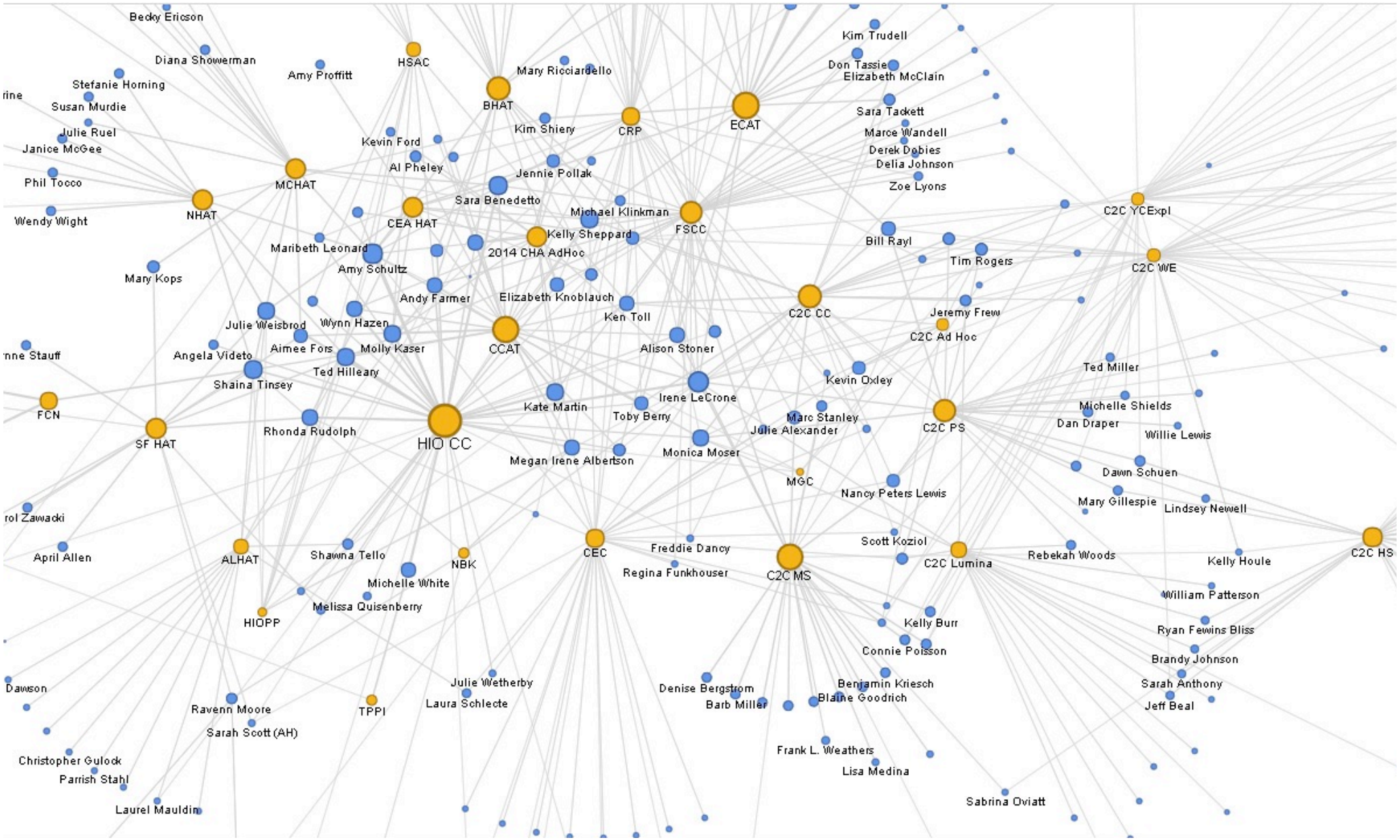
The community triangle: care integration in Jackson

Behavioral Health

Social Services

Clinical Delivery System

Jackson HIO CC social network



Care Model ad-hoc group

Co-design of Community Care Model

- Over 30 CSAs, 9 clinical sites involved
- 19 agencies actively participating
- Model identifies core steps in care process, and points where agencies can connect
- Does not replace internal CSA workflows

Pilot test of 2-1-1 Navigator referrals

- 95 referrals from medical CMs
- 240 needs – financial > housing, food, insurance > transportation
- PLUS 67 discovered needs – financial > medical, insurance
- Working through boundary issues

Pilot Agency and Data/IT ad-hoc groups

Co-design of community IT infrastructure

- Configuration of SS Nav application and connecting infrastructure (‘hub’)
- 12 agencies actively participating
- Active partnership with RiverStar, JCMR (Epic), Michigan 2-1-1, MiHIN
- Coordination with DHHS and MIBridges portal

Functionality

- SDOH screener, ASSM assessment
- Link to 2-1-1 through taxonomy
- Closed-loop referral tracking
- Data exchange (SDOH, referrals) with Epic
- Hub, outcome tracking in progress