

AGENCY FOR HEALTHCARE RESEARCH AND QUALITY

AHRQ

Learning health system research programs within delivery systems – what factors affect program contributions?

Michael Harrison and Amanda Borsky
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality
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AGENDA

- Research questions
- Background
- Study design & analysis
- Findings
  - Analysis framework & examples
  - Comparing LHS program contributions
- Implications:
  - Considerations for researchers
  - Considerations for funders

Disclaimer

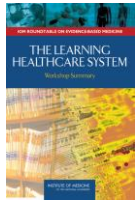
- This study was supported by AHRQ, but the information and views expressed in it are those of the authors and do not represent those of any entity within the federal government.

Research Questions

- How do care delivery systems organize embedded research (AKA LHS research) that addresses the system's operational goals & priorities?
- What features of LHS programs & the systems in which they are embedded enable these programs to make positive contributions to system improvement & learning?

Related National Efforts

- AHRQ K12 Awards for Supporting the Next Generation of Learning Health Systems Researchers
- AHRQ ACTION Network
- HCSRN – organization bringing together research centers of many health systems, LHS interest group
- National Academy of Medicine reports on learning health systems (e.g., NAM)
- Embedded Research Conference (Pasadena, Feb. 2019)
- AcademyHealth
  - Interviews on LHS initiatives
  - Pasadena conference
  - LHS Interest Group



STUDY DESIGN AND ANALYSIS

Plan Criteria

- Select 6-8 health systems with the following characteristics:
  - The system **employs** people engaged in embedded research
  - The system has been engaged in embedded research for at least **two years** (i.e. began embedded research no later than a year prior to the year of interviews)
  - The system has a **distinctive approach** to embedded research or was identified in our scan as a recognized as a leader in this field
- Interview up to eight people in each system with the following roles:
  - Executive-level manager
  - Person exercising oversight over embedded research activities
  - Person from a service line or care sector in which several embedded research projects have been carried out
  - Lead investigator on one or more embedded research projects

Study Design

- Case study design (n=6 LHS sites)
  - Started with 8 systems; dropped 2 after initial interview
- Data sources:
  - 44 hour-long, semi-structured phone interviews with 41 system leaders, LHS directors, LHS investigators – reached through snowballing
    - Range of 4-8 interviews per site, including one final follow-up interview (post start of pandemic)
    - Average: 6 per site
    - Main interviews: 10/7/2019-2/19/2021
    - Follow-up interviews 3/15/21-4/15/2021
  - Interviews with 12 LHS experts & practitioners
  - Published/grey literature

System Profiles

#	Description	Teaching Intensity [b]	Phys-icians [c]	Hospitals (beds)[d]	# Out-patient medical groups [e]	ACO participation	Very large proportion of low income patients [f]
1	Regional system, including academic hospital	Major	9100	10 (2400)	280	Yes	yes
2	Regional system	Minor	800	3 (1100)	130	yes	no
3	Academic medical center; serves as specialty hospital for university	Major	1000	1 (600)	20	no	no
4	Region within integrated delivery system	Minor; Family Medicine. residency	1000	0 (NA)	1	no	no
5	Academic medical center	Major	1500	1 (400)	90	yes	yes
6	Multi-state system & Academic Medical Center	Major	6800	28 (2900)	185	yes	no

Analysis Methods and Stages

- Developed codebook for use with NVivo
  - We independently reviewed more than 7 interview transcripts & assessed for agreement. Double coding stopped when consistently reached over 85%.
- Modified coding structure & methods & adopted method of rapid qualitative analysis
  - Coded 4+ interviews & stopped once consistently reached agreement for over 85% of the coding elements
  - Completed coding & analysis using this method

Rapid qualitative analysis

- Interviews summarized in structured templates; templates consolidated into study-site matrices.
- Similar to thematic analysis but takes a more pragmatic approach

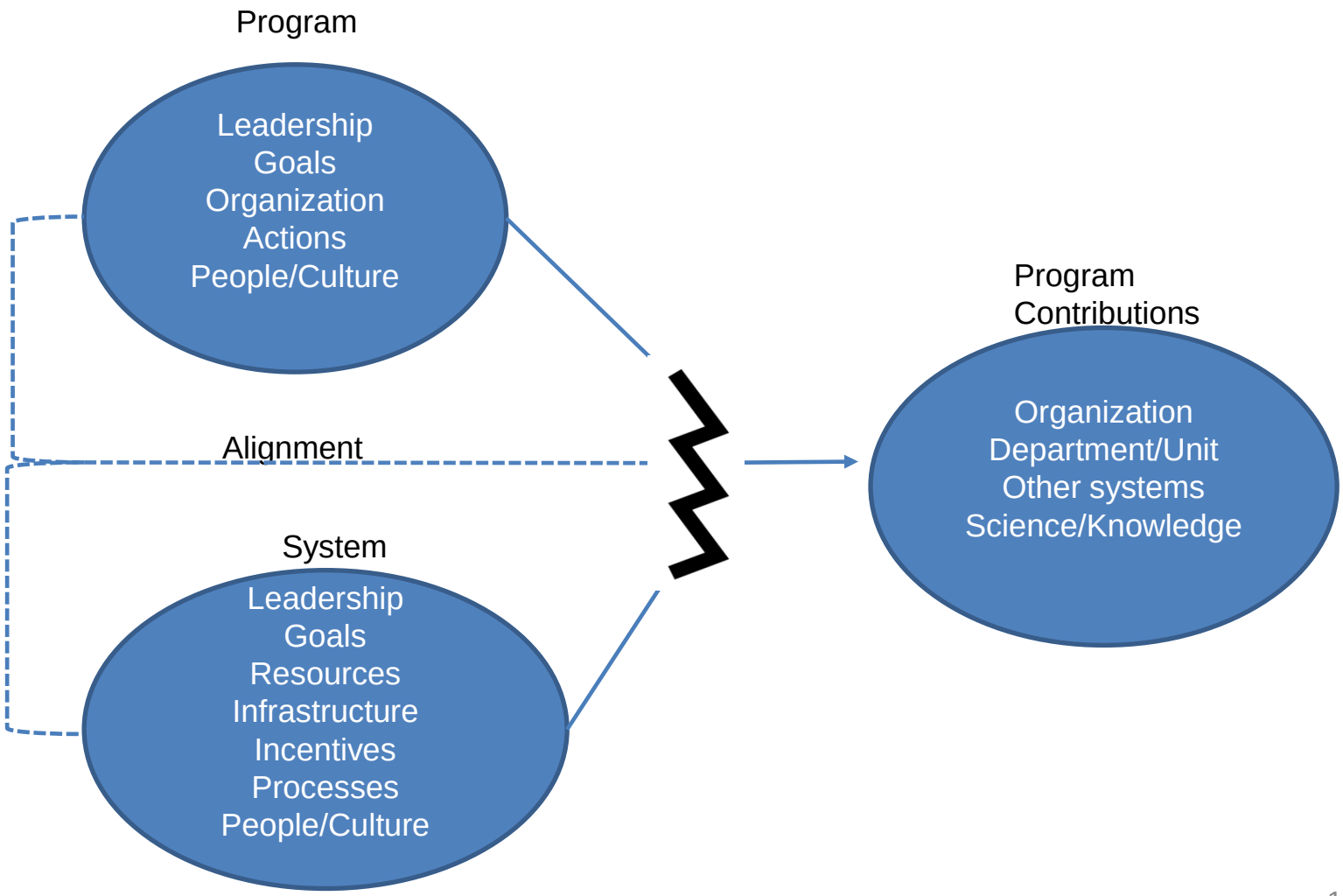
- Gale, R.C., Wu, J., Erhardt, T. *et al.* Comparison of rapid vs in-depth qualitative analytic methods from a process evaluation of academic detailing in the Veterans Health Administration. *Implementation Sci* **14,** 11 (2019). https://doi.org/10.1186/s13012-019-0853-y
- Hamilton A. Rapid Qualitative Analysis: Updates & Developments. VA HSR&D Cyberseminar September 29, 2020. PowerPoint Presentation.
- Qualitative Methods in Rapid Turn-Around Health Services Research (va.gov)
- Taylor B, Henshall C, Kenyon S, Litchfield I, Greenfield S. Can rapid approaches to qualitative analysis deliver timely, valid findings to clinical leaders? A mixed methods study comparing rapid & thematic analysis. BMJ Open. 2018 Oct 8;8(10):e019993. doi: 10.1136/bmjopen-2017-019993. PMID: 30297341; PMCID: PMC6194404.

FINDINGS

Research Settings

Sys-tem	Location in system	Size	Internal funding	Focal areas related to LHS research
1	Research institute in regional system	Large	Low	Quality& safety; health IT, surgical outcomes; economics & policy; patient engagement; equity & population health
	Applied science unit in system's Innovation institute & affiliated with research institute	Moderate	Moderate	
2	Independent unit in regional system	Moderate	High	Population health; community-engaged research (SDOH); Operations research
3	Independent unit in academic medical center	Large	Moderate	Assessing & improving clinical outcomes; safety & regulatory compliance; patient experience; access; equity, patient, family, community health & well-being, data & analytics; QI training
4	Research institute within region of integrated delivery system	Large	Low	Evidence reviews; analytics; implementation design, evaluation; & support (e.g., practice facilitation).
	LHS program in research institute within region of integrated delivery system	Small	High	
5	Research center in academic medical center	Small	Moderate	Implementation science & , improvement science research, including support for other investigators, education; training in research & implementation science.
6	Research center in multi-state system/academic medical center	Large	Low	Healthcare engineering; social & behavioral sciences; knowledge synthesis; bioethics; research training; Quality data platform (with Quality & Affordability Department)
	Division of care delivery research	Moderate	High	

Analysis Framework



Contributions

- Contributions within delivery system in which LHS program staff are embedded
  - Organization as a whole – or large parts of it
    - E.g. medical ready for discharge program
  - Departments or Units –
    - E.g. reduced surgical errors; behavioral health screening in PC
- Contributions outside of system
  - Other delivery systems
  - Science/knowledge

Program Characteristics

- **Leadership** – experience & skills, tenure, standing in organization; program representation & oversight
- **Goals** - mission & goals (official & observed); specific objectives/targets
- **Organization** – funding; program location, links to administrative & clinical groups & operations
- **Actions** - common activities; time allocation; project selection processes; training/learning activities
- **People/Culture** – skills- including LHS core competencies; training; values

System Characteristics

- **Leadership** – prioritization of learning, research, training, interest in/ support for LHS program; focus on bottom line/reported metrics
- **Goals** – mission, goals for LHS program & learning in general
- **Resources** – for LHS program & support for learning, innovation, implementation of EB practices
- **Infrastructure** – support for learning – e.g. data resources, communication channels
- **Processes** – performance benchmarking & feedback; team training, QI, data analytics, innovation, implementation of EB practices, communication
- **Culture** – psychological safety; sharing across units/specializations; Values/engagement in learning from experience/external sources, innovation, improvement; patient-family engagement; community service/engagement; equity; academics

Alignment

- Two characteristics (of programs or systems) are well aligned with one another when the outputs or consequences of one characteristic form useful inputs/conditions for the other element
  - Example: LHS staff skills are well aligned with program goals if staff skills enable them to understand & respond appropriately to system leaders' primary improvement objectives

Alignment Examples

- Strong alignment between program organization & the delivery system's goals for LHS program: LHS leaders in one system we studied (#4) maintain close contacts with top delivery system leaders & review annual program objectives with them
- Weak: In several systems staff incentives (culture) are not well aligned with actions needed for LHS researchers to engage in collaborative improvement with clinicians & administrators. LHS researchers are subject to academic incentives (extramural funding; scientific presentation & publication), which discourage them from treating clinical staff as partners in improvement & learning.

Comparing Program Contributions – System 4

- Ongoing partnership with mental health (MH) service line; substantial role in introducing, spreading, sustaining new practices & staffing role in PC to address MH screening & responses to SDOH
- Successful projects in other departments but these have not become continuous learning collaborations
- Pandemic: Significant contributions included rapid evidence reviews, identification/outreach to patients at risk
- Executive expresses continuing support, maintains program's annual budget; seeks more explicit partnering with LHS program by research institute's externally-funded researchers

Comparing Program Contributions – System 2

- Limited contributions to organization or departmental improvement
- Program gives substantial support to residents' research projects (part of training requirements)
- Pandemic: contributions to modeling demand, needs throughout state, supporting hospital work adaptations

- Some clinical leaders unhappy with lengthy research timelines; researchers' lack of clinical knowledge; evaluations & research threatening favored practices

- 2017. Executive sought closer integration with clinical domain. Reorganized program, replaced director; some researchers left

- 2020. New CEO renames, reorganizes program --
  - MDs replace researchers as leads of program's focal areas
  - Staff reductions (-8 FTEs); 2 leading researchers leave for academic positions
  - Program leaders reevaluating all current projects for alignment with C suite priorities

Comparing Program Organization & Alignment (1 of 3)

Program location	System 4	System 2
Leadership	Co-leads with strong LHS orientation & significant improvement experience	Director is MD with strong ties to clinicians & leadership; PhD co-lead has strong service orientation,; academic research training, limited experience in improvement /implementation
Goals	To benefit patients, accelerate learning about improving care; leverage science to implement evidence-based practices	Conduct research with clinical enterprise that improves health outcomes
Organiza-tion	Funding: small portion of research institute budget provides 50-100% FTE for 8 people; remainder of funding from grants. Links: program is part of research institute, but LHS leaders maintain direct ties to system's sr. leaders; collaborate with QI unit Operations: project areas: evidence review; analytics; implementation design, support, evaluation; implementation science.	Funding: 90% hard funded (budget, endowment, state infrastructure funding). Links: research teams linked to system committees (e.g., operations); little collaboration with QI group. Operations: ~ 35 FTEs;, PhD leaders for 3 focal areas (population health, community-engaged research (SDOH), operations research).

Comparing Program Organization &Alignment (2 of 3)

Program location	System 4	System 2
People/Culture	LHS staff deeply committed to improvement, learning, strengthening primary care; researchers in larger research institute focus on funded research &publications LHS project staffing- draws *selectively* on institute's researchers based on expertise & adaptability to dynamics &demands of LHS work on improving care delivery	Research leads have strong academic orientations/backgrounds; limited familiarity with clinical practice; prefer investigator initiated, non-(collaborative) style; limited background/engagement in change management, QI, implementation.
Actions	Selection of potential projects through dialogue with department leaders, followed by vetting with senior leadership; Testing, implementing, supporting (data feedback, facilitation) new care practices/designs;	Program solicits needs from clinicians; researchers propose projects; some funded research. Areas: substantial support for residents' research (training) studies; evaluations; community/epidemiological studies; operational modeling projects

Comparing Program Organization &Alignment (3 of 3)

Program location	System 4	System 2
Leadership/Goals	Conduct research supporting most strategic priorities; work closely with departments (e.g., quality, patient experience); top leaders endorse program work on community engagement, enhanced primary care; seek to bring more members of research institute into LHS work	Envision LHS program enhancing value-based care, addressing SDOH in surrounding communities.
Infrastructure	QI unit cooperates with LHS; large research institute provides potential experts for LHS projects.	QI separated from LHS program several years ago; limited interaction now; few researchers beyond LHS unit have skills needed for LHS projects; limited resources supporting academic research
Culture	Research institute has quasi-academic culture System has strong commitment to evidence-based care, patient engagement, equity; operates self-insurance program. Some clinicians have medical school appointments.	Physician centric; strong focus on community health; system operates ACO. Some clinicians have medical school appointments.

IMPLICATIONS

Considerations for Researchers

- Balance needs for short-term & long-term research & assistance
  - Executives, department chairs, & operational leaders think & work in much shorter time frames than researchers. To respond to leaders' immediate concerns, researchers can combine short-term assistance with longer-term projects
- Provide frequent updates & interim findings
  - Frequent, actionable feedback makes research findings & assistance more useful to organizational & departmental leaders
- Listen & stay attuned to leaders' concerns & needs. Identify key metrics & outcomes that they worry about
  - LHS researchers learn what's important to clinical & operational leaders by maintaining regular contact with them & seeking feedback on how research can help address their concerns

Considerations for Researchers (2)

- Balance internal & external funding
  - Although external funding will likely be needed to support LHS work & to meet researchers' career goals, LHS researchers need to make the system benefits of externally funded projects evident to system leaders – in the metrics that matter to them
- Collaborate fully with clinical staff
  - Clinical staff are more likely to support & implement research findings when they actively collaborate in their design
  - Clinical staff have ultimate responsibility for implementing & sustaining recommended changes & for supporting learning within their departments
- Make implementation & sustainment central to projects
  - Actionable, feasible recommendations are more likely to be adopted
  - Further changes & resources may be needed to sustain improvements after research & demonstration projects end

Considerations for Funders

- Evaluate capacity & commitment of recipient systems to post-funding sustainment
  - Newly implemented practices & designs require active support when funding expires
  - System leaders with “skin in the game” are more likely to support, implement, & sustain changes

- Support development of models & metrics demonstrating benefits of LHS research in terms of metrics & outcomes valued by system leaders
  - LHS researchers within systems & external LHS advocates find it hard to make a case for system support of research, sustainment of demonstrated improvements, & continuous learning; research is needed on the effects of LHS work on outcomes that matter to leaders

- Support development of learning infrastructures & processes within & across systems serving underserved populations
  - Safety-net delivery systems often lack the resources to invest in improvement/learning capacity

Considerations for Funders (2)

- Fund research addressing widespread, critical system challenges
  - LHS researchers can more readily align external funding with internal needs when solicitations target pressing system challenges, such as opioid use, areas of widespread innovation (e.g. virtual care), or improvements affecting widely reported & incentivized metrics (e.g., patient experience, readmissions)

- Train researchers to work rapidly & flexibly with clinical & operational staff, applying research skills to emerging needs & challenges
  - Researchers using these skills made significant contributions during the pandemic & beforehand. Some notable areas: modeling care demand & supply; rapid evidence reviews; analysis & feedback of available data on innovative practices (e.g., virtual care); & facilitation of workflow changes

- Allow for flexibility in execution of funded studies
  - Researchers need opportunities to adjust project designs to fit emerging conditions & unforeseen challenges

Questions & Discussion

SUPPLEMENTARY TABLES

Research Settings (1 of 3)

Site	Location in system (year established)	Leader(s)	Reporting	Size	Funding	Focal Areas for LHS-related work
1	*Research institute* in regional system (2010)	MD	CEO & other C suite officers	~300 staff support 100s of researchers across system, who conduct studies through the institute; number of operationally-related researchers varies by project; 3 research FTEs in health economics & policy are operationally focused	Mainly externally funded (grants & contracts); some internal seed money; internally budgeted: 3 FTE in health economics & policy; ~15% of quality & safety work	Quality& safety; health IT, surgical outcomes; economics & policy; patient engagement; equity & population health.
	Applied science unit in system's Innovations institute (2010), affiliated with Research institute	PhD	Chief Science Officer (Director Research Institute)	~30 FTE;	Mainly externally funded; 25% internally budgeted	
2	*Independent unit* (2013) within regional system	MD lead; PhD Co-lead	CMO	~35FTEs	Mainly Internally funded; ~90% hard funded from budget, endowment, state grant; clinical departments fund affiliated clinicians	Population health; community-engaged research (SDOH); Operations research

Research Settings (2 of 3)

Site	Location in system (year established)	Leader(s)	Reporting	Size	Funding	Focal Areas for LHS-related work
3	Independent unit (2010); previously academic division (~2001-2010) within academic medical center/specialty hospital	MD & MD/PhD co-leads	MD/PhD to CMO & Chief of Academic Dept; MD to COO	~200 FTEs (~100 of these focused on operational improvement; including ~100 researchers of whom ~ 80 focus on LHS research)	Operational im-provement (~40% total expenditures, funded internally by hospital. Research (60% total expenditures -- mainly externally funded but includes internal research funding, joint clinical appointments)	Assessing & improving clinical outcomes; safety & regulatory compliance; patient experience; access; equity, patient, family, community health & well-being, data & analytics; QI training
4	Research institute within region of integrated delivery system	MD/MPH	CEO	~350 FTEs; ~65 participate in LHS projects on per project basis	Most of research institute is externally funded;	Evidence reviews; analytics; implementation design, evaluation; & support (e.g. practice facilitation).
	LHS Program (2017) in research institute within region of integrated delivery system	3 co-leads: MD/MPH, MSPH, &. MHA	MD/MPH to CMO; other co-leads to VP for Research	8 members;	health system funds 50-100% FTE for LHS staff.	

Research Settings (3 of 3)

Site	Location in system (year established)	Leader(s)	Reporting	Size	Funding	Focal Areas for LHS-related work
5	*Research center* (2016) in academic medical center	MD, PhD, co-leads	MD to chair of clinical dept; PhD. to chair of dept. in School of Public Health; Center's program mainly overseen by Chair, Dept. of Medicine	2 half-time leads, staff fellow & support staff	Externally funded mainly; Research grants, departmental allocations for resident's research; ~1.5 FTE from Dept of Medicine; some additional funding from NIH-funded institutional grant.	Implementation science & , improvement science research, including support for other investigators, education; training in research & implementation science.
6	*Research center* within multi-state system & academic medical center	MD & administrator co-lead;	MD to Executive Dean of Practice;	120 FTEs (researchers, engineers, analysts; other staff); researchers outside center also collaborate on projects	Mainly externally funded	Healthcare engineering; social & behavioral sciences; knowledge synthesis; bioethics; research training; Quality data platform (with Quality & Affordability Department)
	*Division of Care Delivery Research (*location of most LHS research within institute)	PhD.	Director, research center	20 of above 120 FTEs are Care Delivery Research faculty ;~50 of above 120 FTEs are analysts & other roles.	Most of division faculty have ~ 2/3 internal funding (budget & endowment) & 1/3 external	