Applied Systems and Implementation Science to Support Population Health Outcomes in the Era of Health Reform

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BACKGROUND

Environmental Context:

- Dynamic, interacting factors shape public policy priorities.
- The public health workforce is one of many stakeholders that must collaborate for sustainable change.
- Within complex public health systems, no single entity has the ability to identify a need, explore and select a response, and prepare for and deliver that response as intended.
- Very few well-defined, evidence-informed practices exist for navigating these complex systems in the midst of health reform.
- Implementation and systems science can be used to develop, plan, support and assess change efforts over time.[1]

Our Role:

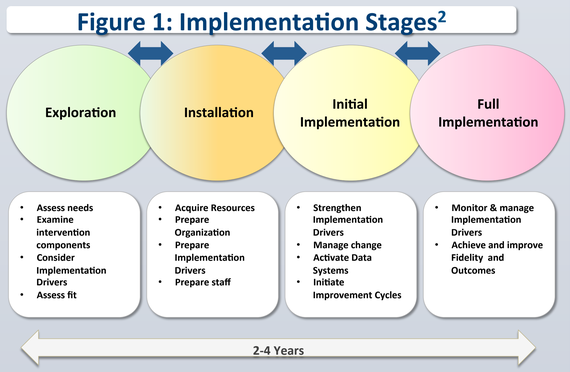
The National Maternal and Child Health (MCH) Workforce Development Center (Center) provides state and territorial MCH leaders and their partners training, collaborative learning, coaching and consultation to advance health reform implementation to:

- Shift the emphasis of health service delivery from disease management to prevention and population health management, while improving access to services;
- Develop an interdisciplinary approach to health, integrating primary care, public health and specialty care;
- Improve health systems efficiency through ongoing quality improvement; and
- Drive partnerships across sectors to optimize the well-being of maternal and child health populations.

OBJECTIVE

Describe how applied implementation and system science tools can guide and inform health reform efforts to improve the lives of women, children, families and communities.

Figure 1: Implementation Stages[2]



DATA SOURCES & METHODS

- The Center worked intensively with eight states to address their complex health reform challenges.
- A Center research team staged each state using the Active Implementation Frameworks[3] both before and after the intensive training. (See Figure 1).
- The stages helped to 1) clarify short and long term aims of the state proposals; 2) inform initial work with states to refine objectives and action plans; 3) align training, coaching and consultation strategies with state needs; and 4) identify and monitor appropriate milestones for state progress during the intensive collaboration.
- The Center utilized systems science tools to elucidate how systems shape states' health reform challenges.

Table 1: Summary of State Progress

Focus	State	Aim	Key Tools Used[4]	Accomplishments
CYSHCN and Care Coordination	CO	Minimize gaps, avoid duplication, and maximize the value of care coordination services	• **Whole System Mapping** • **Process Flow Diagramming** • Impact Matrix	1. Established and/or strengthened relationships between key state and local partners 2. Successfully used workforce development tools 3. Identified over 40 programmatic and cross-agency policy/systems change opportunities 4. Established data sharing agreement between the programs that serve CYSHCN to review caseloads and assess duplicate clients
		Implementation Stage at Entry: **Exploration**		Implementation Stage at End of Intensive: **Installation**
	MN	Improve cross-systems care coordination and increase the focus on CYSCHN in policy making across systems	• Measurement Tables • **Whole System Mapping** • **Network Mapping** • **Care Mapping** • **Circle of Care Modeling** • Logic Model • State Assessment Tool	1. Successfully convened stakeholders in dynamic way 2. Produced doable action steps to support MN CYSHCN Strategic Plan 3. Identified action steps to assist in directing new SIM grant
		Implementation Stage at Entry: **Exploration**		Implementation Stage at End of Intensive: **Installation**
	MS	Develop an advisory council to improve systems integration and care coordination for Mississippians with special health care needs	• **Care Mapping** • **Circle of Care Framework** • Impact Matrix • Fishbone Diagramming • PDSA Cycles	1. Completed PDSA cycle 2. Kept core stakeholders involved 3. Strengthened parent advisory council
		Implementation Stage at Entry: **Pre-Exploration**		Implementation Stage at End of Intensive: **Exploration**
Screening/Developmental Screening	GA	Enhance system of entry into appropriate public health and community child health services by improving timely program screening of referred children and reducing duplication of effort in obtaining family information for eligibility determinations	• **Process Flow Mapping** • PDSA Cycles	1. Developed standardized intake and assessment forms to place children into services for use by all partners across the state 2. Developed and maintained high collaboration with partners, including family members
		Implementation Stage at Entry: **Exploration**		Implementation Stage at End of Intensive: **Installation**
	HI	Improve developmental outcomes for children through increased screening and referral rates by strengthening coordination of developmental screening and surveillance systems	• **Process Flow Diagramming** • Logic Model • Observational Walks	1. Developed strong team 2. Secured stakeholder buy-in and support 3. Developed process map for six agencies 4. Aligned leadership initiatives regarding screening programs
		Implementation Stage at Entry: **Exploration**		Implementation Stage at End of Intensive: **Installation**
	IL	Increase awareness and educate agencies that have direct contact with infants and families about the importance of newborn hearing screen follow-up	• PDSA Cycle Worksheet • Impact Matrix • **5 R's** • Aim Statement and Charter	1. Completed survey and disseminated to stakeholders (275 responses) 2. Used Center tools to navigate the process 3. Developed relationships with outside entities (DHS; Local Health Dept.; DCFS; UIC) 4. Bridged internal and external "silos"
		Implementation Stage at Entry: **Exploration**		Implementation Stage at End of Intensive: **Installation**
Health Reform &Partnerships	IA	Improve the MCH workforce knowledge, skills, and competencies relative to its role in health care reform implementation	• Value Proposition • Impact Matrix • Measurement Tables • Peer Consult • Access To Care State Assessment Tool	1. Piloted Access To Care State Assessment Tool with internal IDPH group 2. Engaged multiple stakeholders in workforce development planning. 3. Developed plan for assessment tool use with Title V grantees. 4. Began the development of a Iowa focused MCH value proposition/statement.
		Implementation Stage at Entry: **Pre-Exploration**		Implementation Stage at End of Intensive: **Exploration**
Peer Support Networks	RI	Develop core competencies, standardize curriculum, and establish funding pathways for provision of services to sustainable funding for RI's peer support workforce.	• Impact Matrix • **Process Flow Diagramming** • PDSA Cycle Summaries • **Whole System Mapping** • Adaptive Inquiries • **Stock and Flow Diagramming**	1. Developed collaborative environment with new partners 2. Began development of competency/curriculum for peer support workforce 3. Developed work plan for sustainability 4. Defined role of a peer support worker
		Implementation Stage at Entry: **Exploration**		Implementation Stage at End of Intensive: **Installation**

IMPLEMENTATION FINDINGS

1. Two states were in '**pre-exploration'**.
2. Six of the eight state teams were in the '**exploration**' stage;
3. No teams were in '**installation'** (preparing for intentional, facilitated change),'**initial implementation'** (delivering new services/ programs for the first time), or '**full implementation**' (meeting fidelity criteria and sustaining services), underlining the emergent nature of health reform challenges and opportunities for states.
4. All states progressed to a subsequent stage, supported with tailored training, consultation and coaching aligned with their program goals.
5. State teams were able to develop stage-appropriate action plans for sustained, post-intensive efforts.

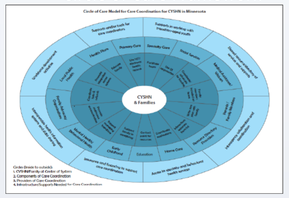
SYSTEMS FINDINGS

1. Systems methods proved to be a valued component of six of eight states' work.
2. Similar methods proved valuable across pre-exploration and exploration stages.
3. If the state's goal was to conduct an exhaustive assessment of existing services, **Whole System Mapping** proved a useful framework for understanding the breadth of service offerings and differences and linkages between them.
4. For states that wanted to identify redundancies and gaps in current services (both within single agencies and across partner agencies), **Process Flow Diagramming** was a useful tool.
5. When it was important to organize a collaborative effort around the voice of the population being helped, **Care Maps** proved a useful way to document the complexity of the system from the user's perspective.
6. States used **System Dynamics, Circle of Care Modeling, and Network Mapping** to visualize all the activities of particular systems and their relationships to one another, as well as impacts on quality.
7. After exploring the system from several angles, the **Circle of Care Frameworks** proved to be a useful tool to integrate insights about overall system objectives (as understood by diverse stakeholders) and factors important to supporting the overall system in meeting those objectives.

Figure 2: Products of Systems Methods

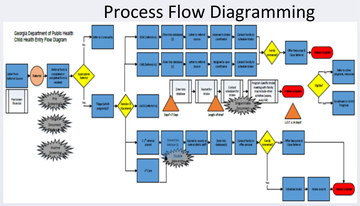
System Dynamics Causal Loop Diagramming

Circle of Care Framework

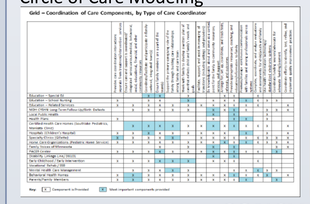


System Support Mapping

Process Flow Diagramming



Circle of Care Modeling



Whole System Mapping

What happens?	For whom?	Where?	When (trigger for entry, frequency)?	Who delivers?	Outcomes?	Who funds?
HANDS home visitation (MECHV)	First-time Moms or Dads, pregnant or enrolled in app; 2. Multi-gravida mothers in high risk counties	In home	Screening to determine risk factors; participation voluntary. Services depend upon family needs identified.	HANDS Home Visitor primary, social service agencies secondary	Better birth outcomes, improved social connections, life course supports	Tobacco settlement funds, state general funds and MECHV
First Steps (Part C)	Age 0-3 with developmental delays or associated conditions	Primarily in-home but also in designated centers or clinical setting	Triggered by referral by anyone; frequency needs based depending upon condition.	First Steps enrolled providers includes Speech/ Language Pathologist, Physical Therapist, etc.	Early intervention services provided with goal of significant improvement in developmental learning as well as reduced stress for family (etc.)	Part C, State General Funds
CYSHCN	Infants and Children under 21 years of age, Kentucky residents	Medical Home, specialty clinic setting or in home, depending upon service.	Children with select diagnoses	Medical Services, Therapy Services, Related lab and Follow-up Services.	Improved health outcomes, successful transition to adult services	Title V and State General Funds
...	...	...	...	...	...	...

Key: C = Component is Provided; M = Most important components provided

CONCLUSIONS

- The Center's engagement offered States an opportunity to identify key factors that shape successful implementation of health reform efforts in the context of complex, fragmented systems.
- Applied implementation science provided relevant tools to explore, design, plan, deliver and continually improve collective change efforts in complex systems lacking well-defined, proven solutions.
- Applied systems science: 1) facilitated the understanding of contextually specific opportunities and challenges, 2) offered frameworks for designing collaborative system intervention efforts, and 3) articulated opportunities for action within and across partner organizations.
- These complementary sciences allowed for the design of evidence informed, locally relevant solutions and provided tools to prepare for, deliver and measure their success over time.
- Applied implementation and systems science approaches provided policymakers and practitioners with concrete methods to understand and measure the broader public health context and account for the dynamic processes through which health is influenced.

REFERENCES

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4. Cohort 1 states used additional tools, but cited these as critical for their overall progress. Blue Text indicates System Science tools used with states.

ACKNOWLEDGEMENT

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