

# Learning Health Systems: Past, Present, and Future

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# Disclosures

I am Chair of the Board of Directors of the Learning Health Community, a non-profit corporation promoting Learning Health Systems.

I'm Patti Abbott's husband

("Visionary Pioneer" of the U. of Maryland School of Nursing)



# Main Menu

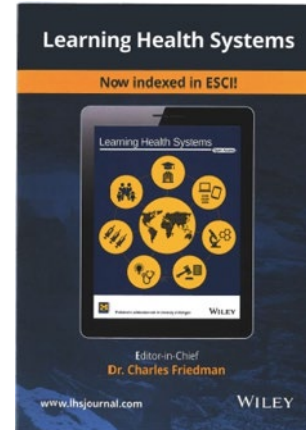
- What are Learning Health Systems (LHS)?
- What makes the LHS approach to health improvement different from other approaches?
  - Embraced uncertainty requiring **discovery**
  - Multi-stakeholder learning communities enabling **continuity**
  - Infrastructure: shared services that create a **system**
- Status of Learning Health Systems at all levels of scale

# Learning Health Systems

*Health systems--at any level of scale--become **learning systems** when they can, continuously and routinely, improve health by marrying discovery to implementation.*



<https://nam.edu/programs/value-science-driven-health-care/learning-health-system-series/>



[lhsjournal.com](http://lhsjournal.com)

Learning Health Systems

Not

~~Learning HealthCare Systems~~

# LHS “Anthems”

(Reward Offered for Putting these to Music)

- Bring us the tough problems!
- A system problem needs a system solution!
- 17 years to 17 months!
  - to 17 weeks to 17 days (to 17 hours)!

# Learning Health Systems Improve Health By Marrying Discovery to Implementation

- ✓ Characteristics, events, and context are captured as data to **learn** from
- ✓ Trusted knowledge generated from analysis of the data is **rapidly available** to support strategies and decisions
- ✓ Improvement is **continuous and enduring** through ongoing **cyclic activity**
- ✓ An **infrastructure** creates a system that enables improvement to occur routinely and with economy of scale
- ✓ All of this is part of the **culture**



# Learning Systems Can Exist at Any Level of Scale

Single Organization



Network of Organizations



States/Provinces/Regions



Nation

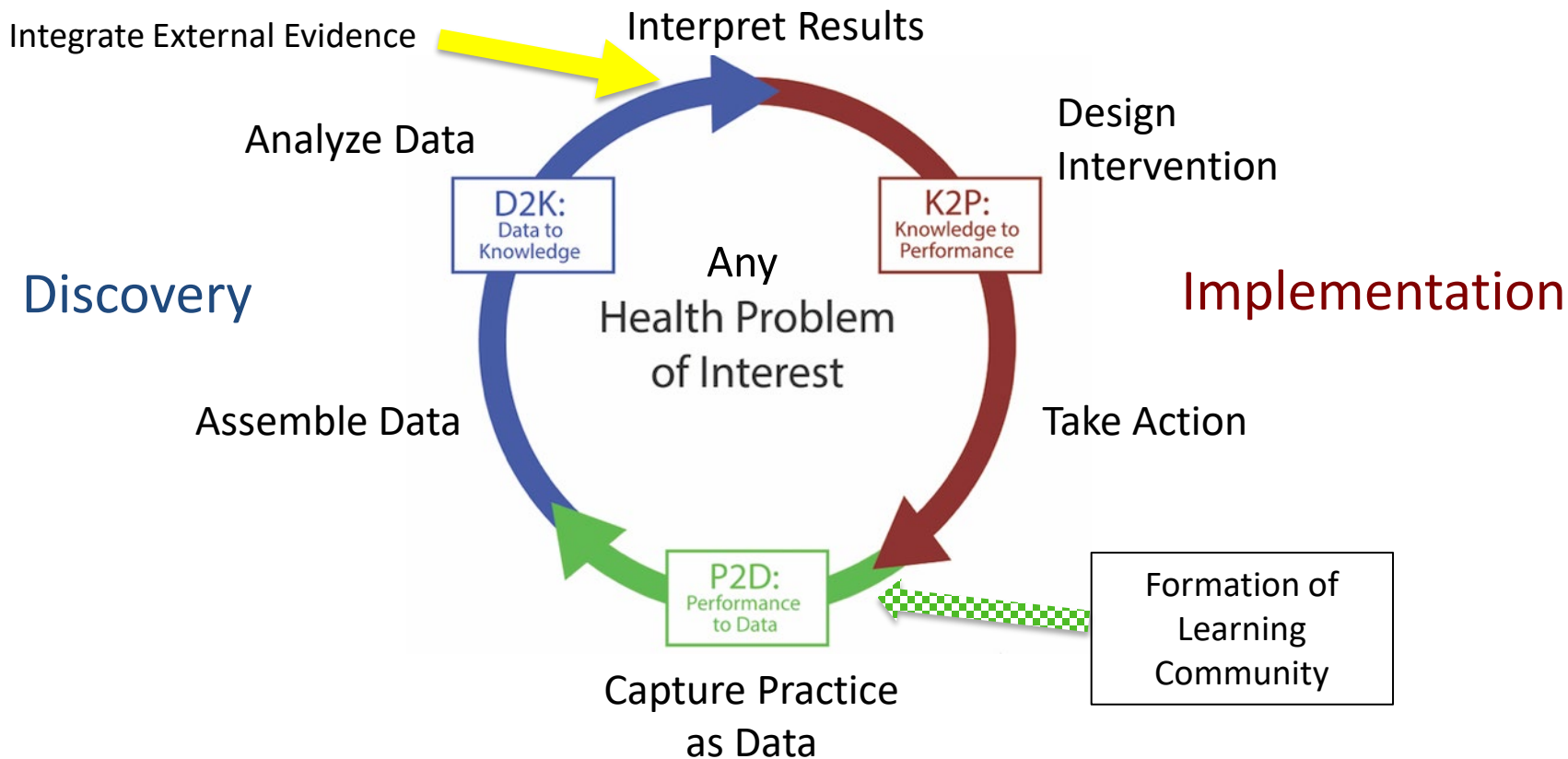


Planet

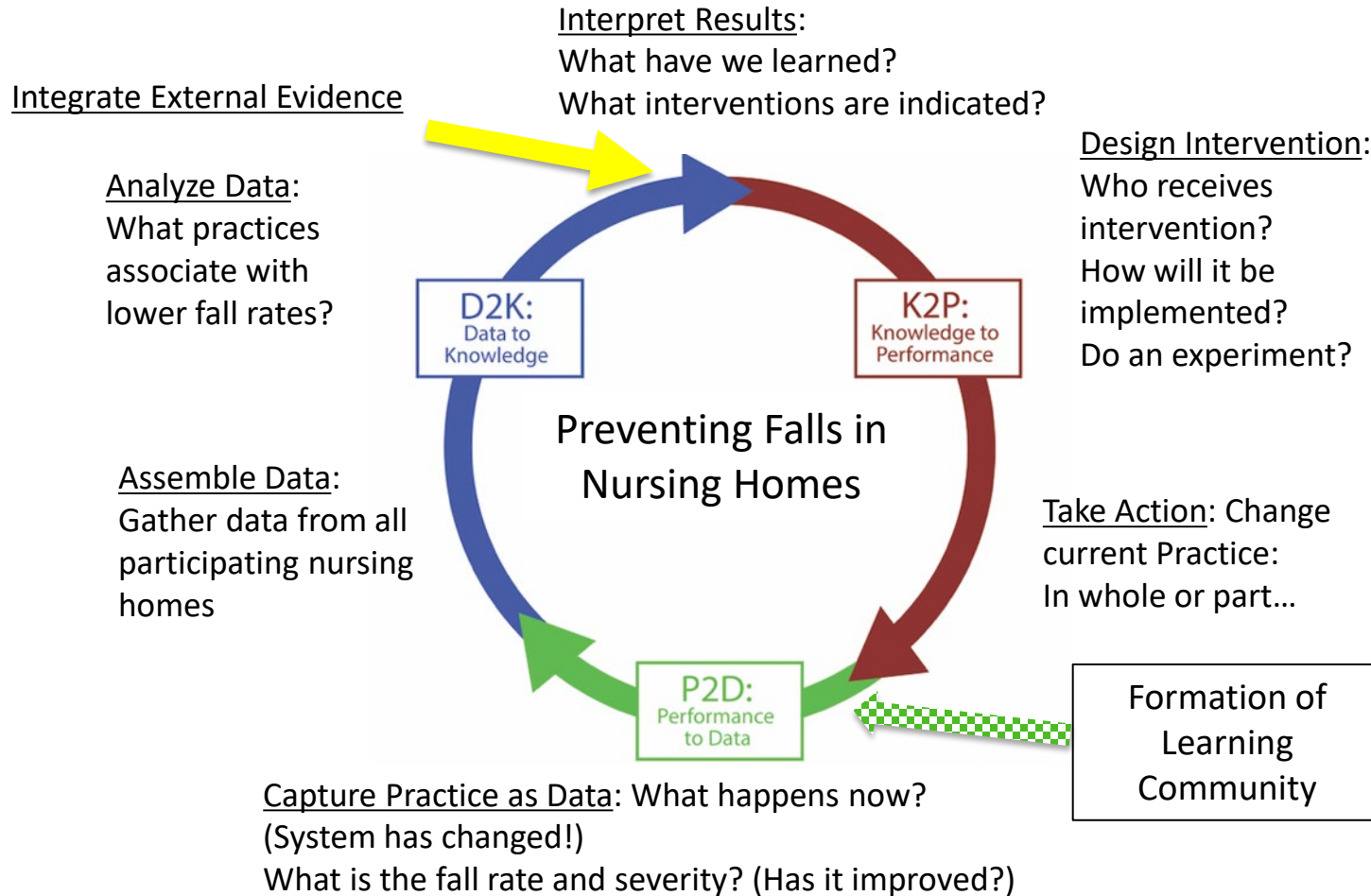




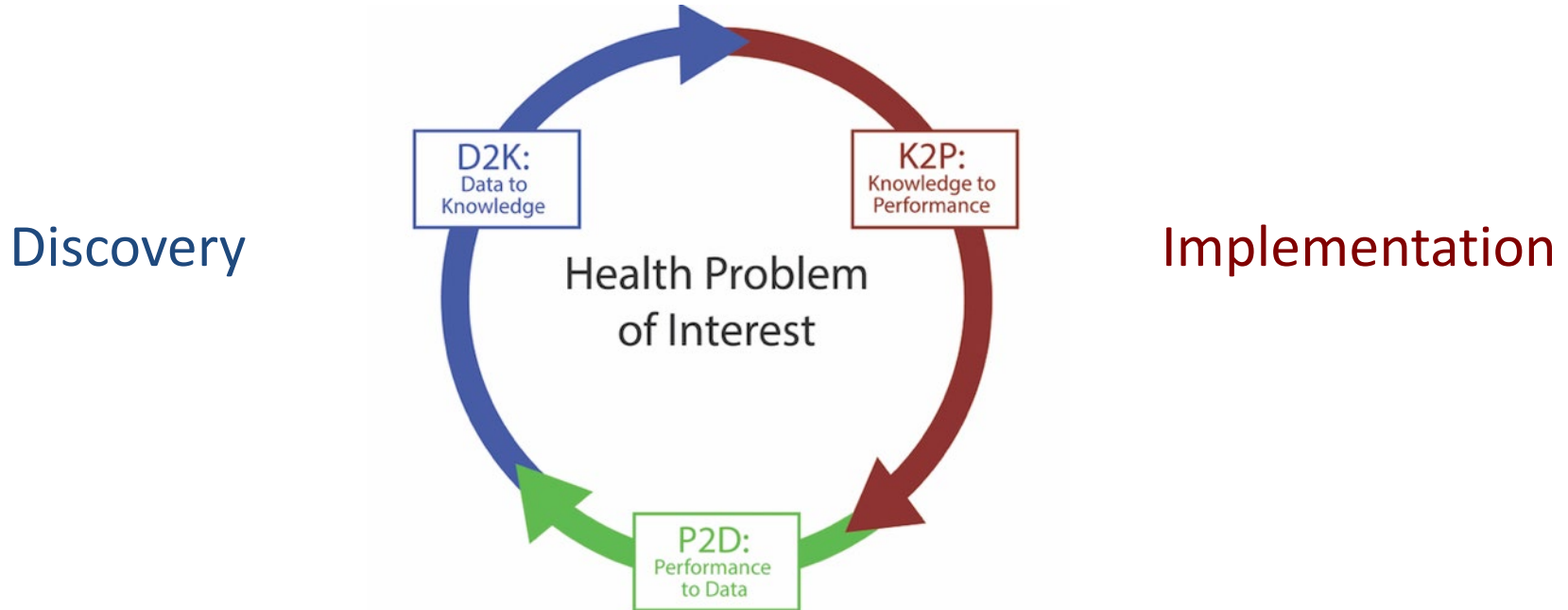
# The Fundamental Activity: Community-Directed Cycles of Discovery & Implementation



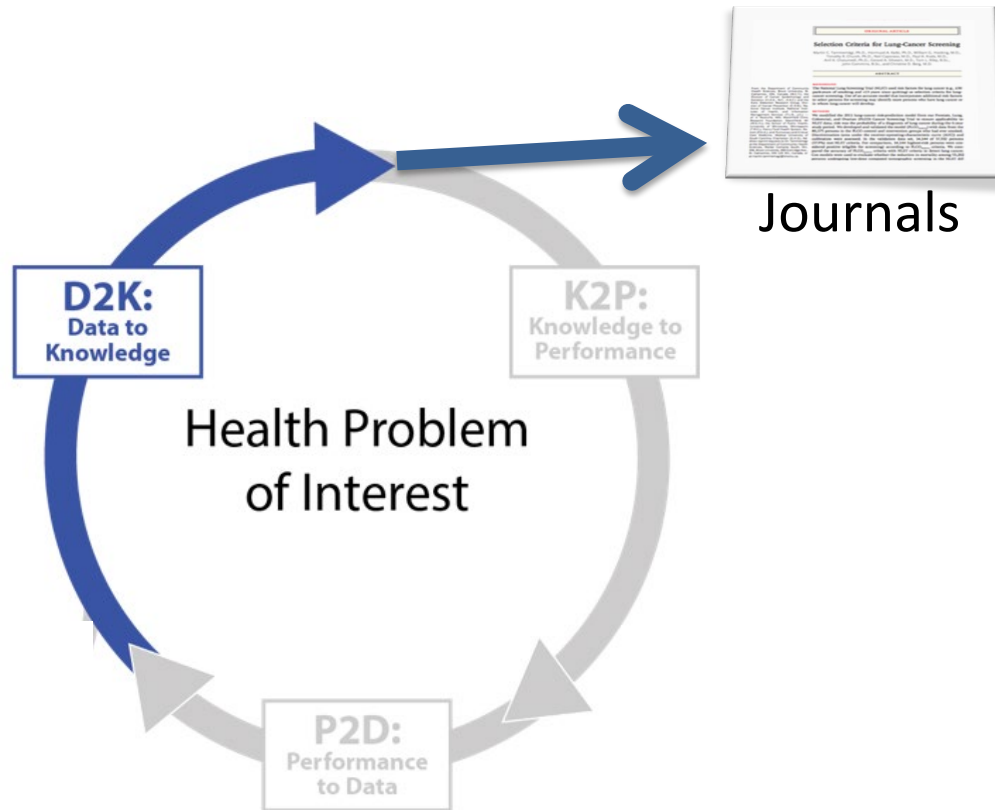
# An Example...



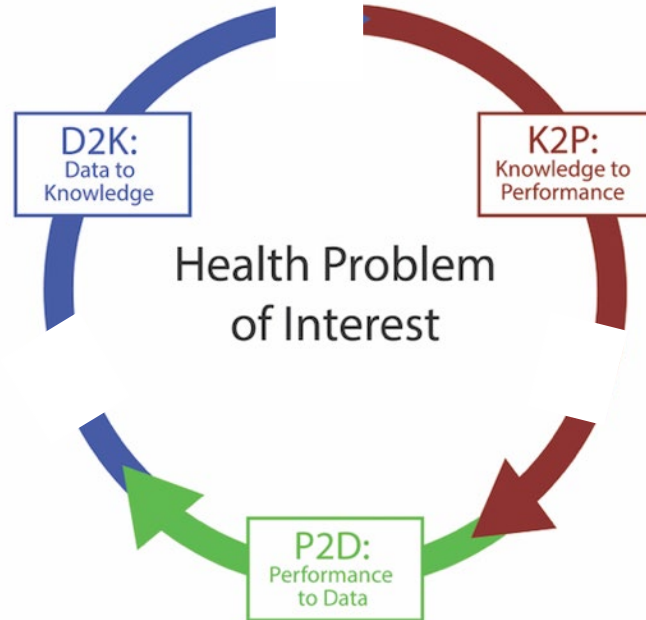
# Better Health Requires This



# Not Just This



# Or This

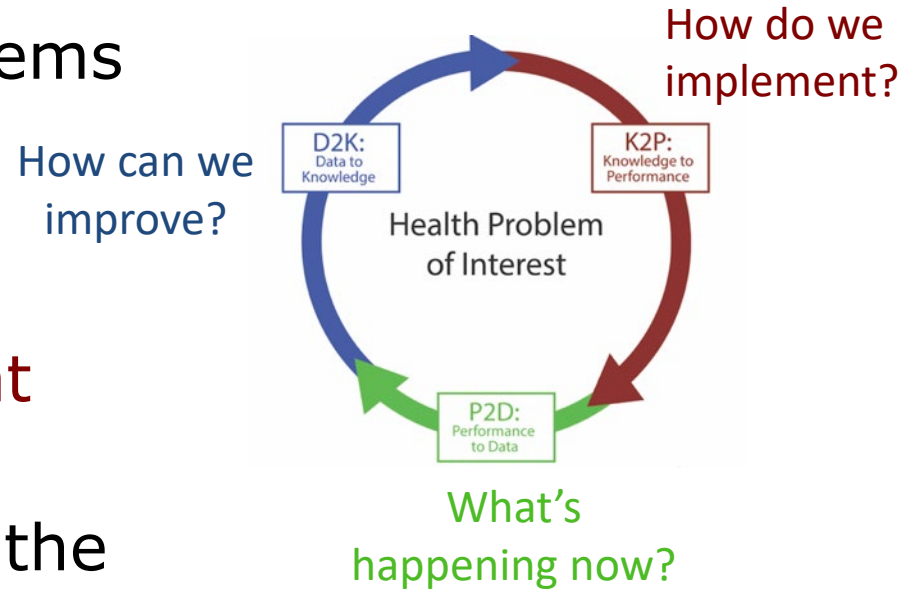


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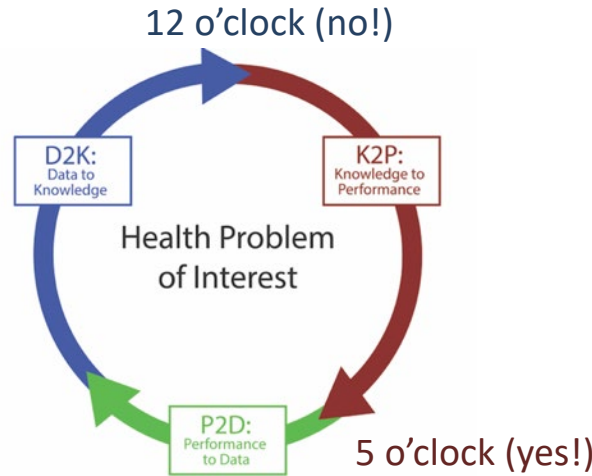
# Embraced Uncertainty

- LHS approaches are most useful to address complex/system problems
- At the outset, the community is **not committed to any particular improvement intervention**
- Throughout the cycle, the community advances through co-discovery



# Where the Cycle Starts

- The learning cycle should start at 5 o'clock and not 12 o'clock.



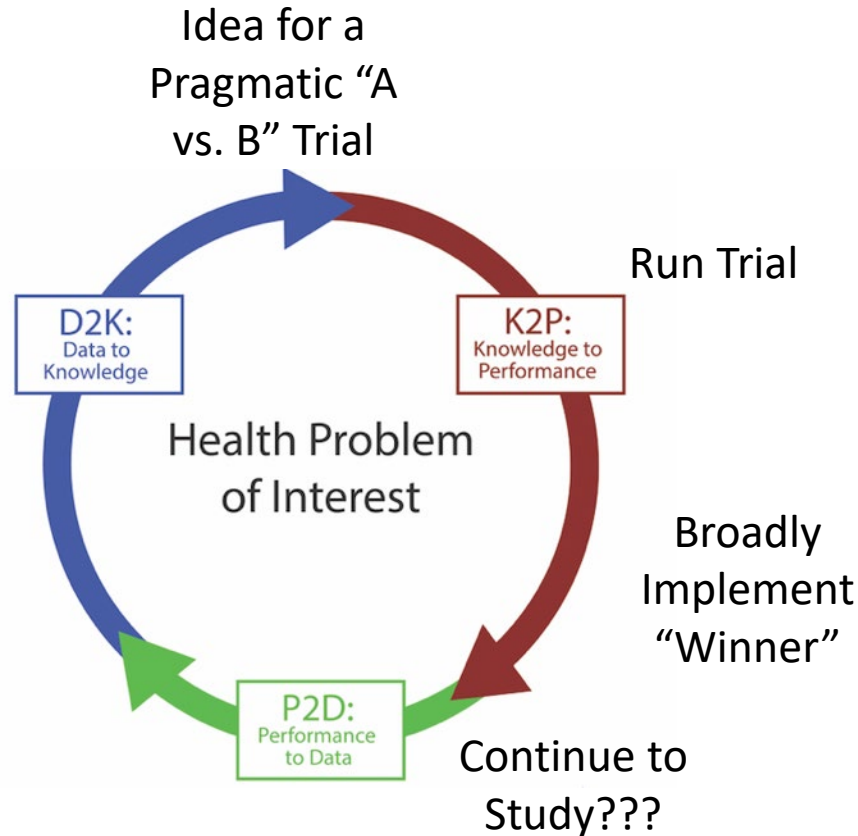
- Starting at 12 o'clock (no!): the community has been told what to do, has made an “evidence-free” decision or an “external evidence only” decision
- Starting at 5 o'clock (yes!): the community collaboratively discovers what to do



# An Example of Starting at 12 o'clock: What Many “LHS” Initiatives are Doing

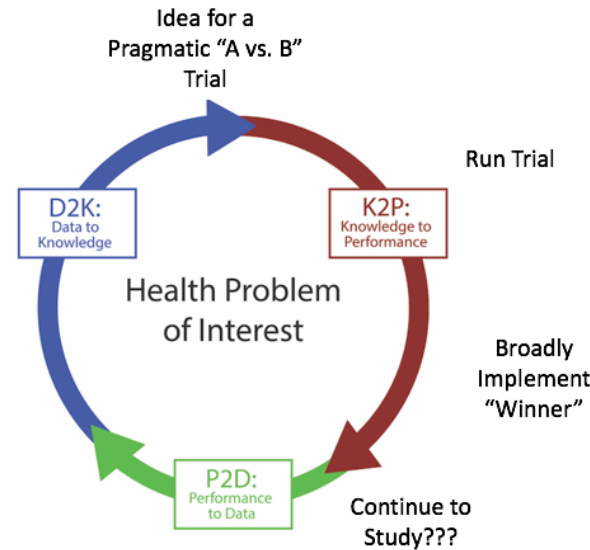
*K2P only  
implementation  
studies are not  
complete  
cycles!*

(For example:  
ADAPTABLE study of  
82 vs. 325 mg of aspirin)



# My Concerns About Starting at 12 o'clock

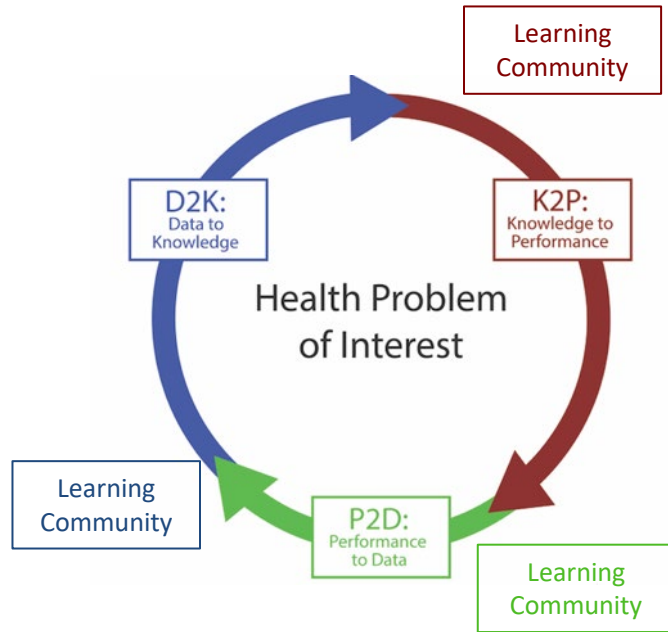
- A vs. B can't address "wicked" system problems
- No people/passion involved or evoked
- Implementation is top down
- No community invested in implementation
- How to discover an unexplored "C" option?
- No commitment to continuous study



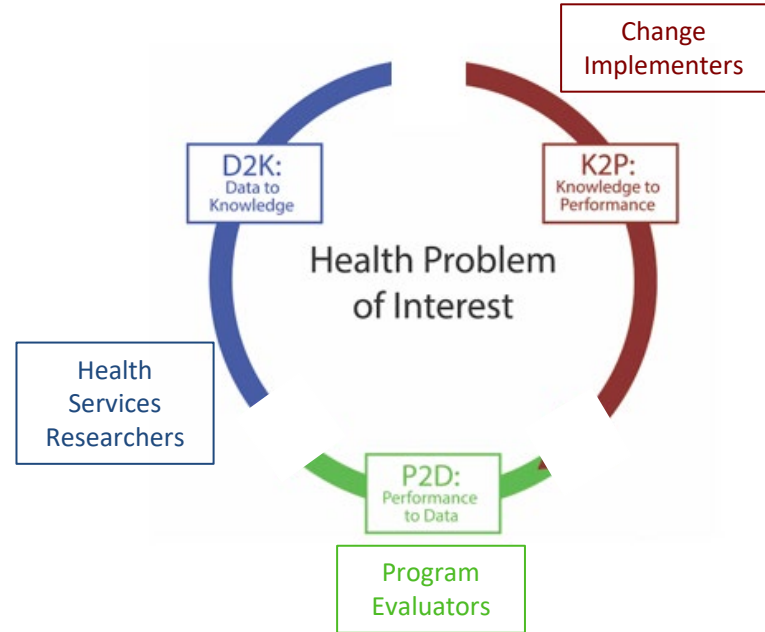
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# *Continuity*: The Community that Discovers is also the Community that Implements



This



Not This

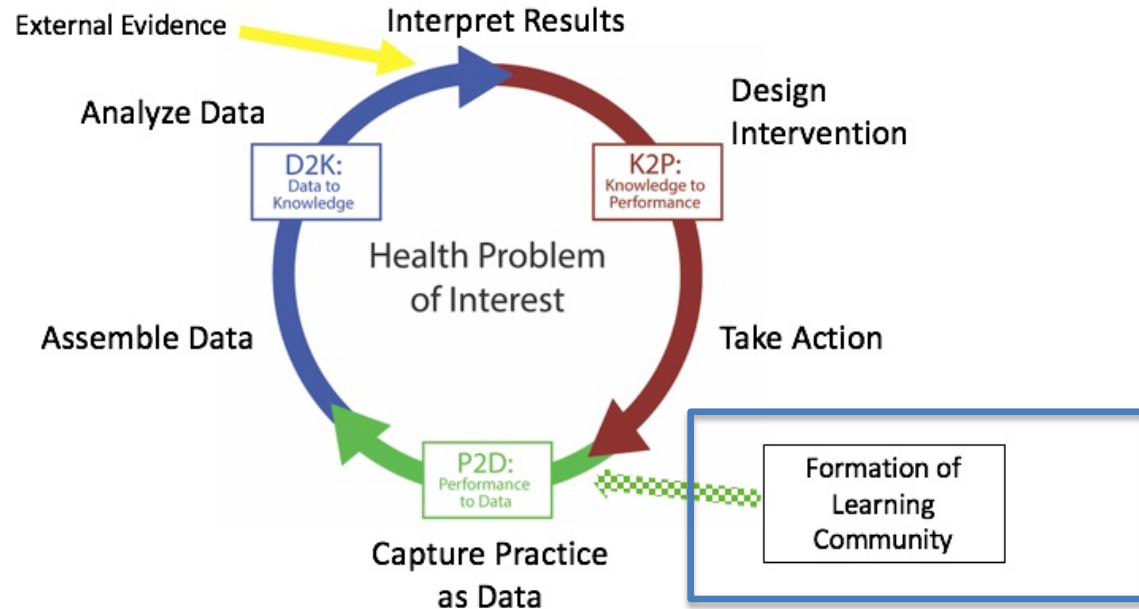
# Learning Communities are Collaboratives

- Multi-stakeholder
- Pursuing a shared goal
- Fueled by “passion” to achieve the goal
- Strategies are “co-produced”
- Not top down
- Leader as facilitator
- No group dominates



# You Can't Skip this Step

(And Once Established, Learning Communities Are Active Across the Entire Cycle)

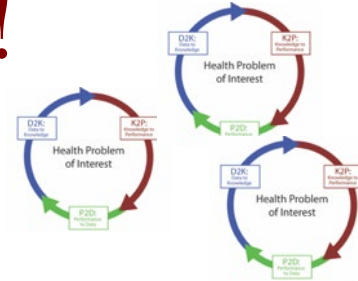


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# Infrastructure!

*Cycles enable improvement but  
do not create a Learning  
System*



- If you want to get 350,000 people per day across a river, does everyone build his/her own rowboat?

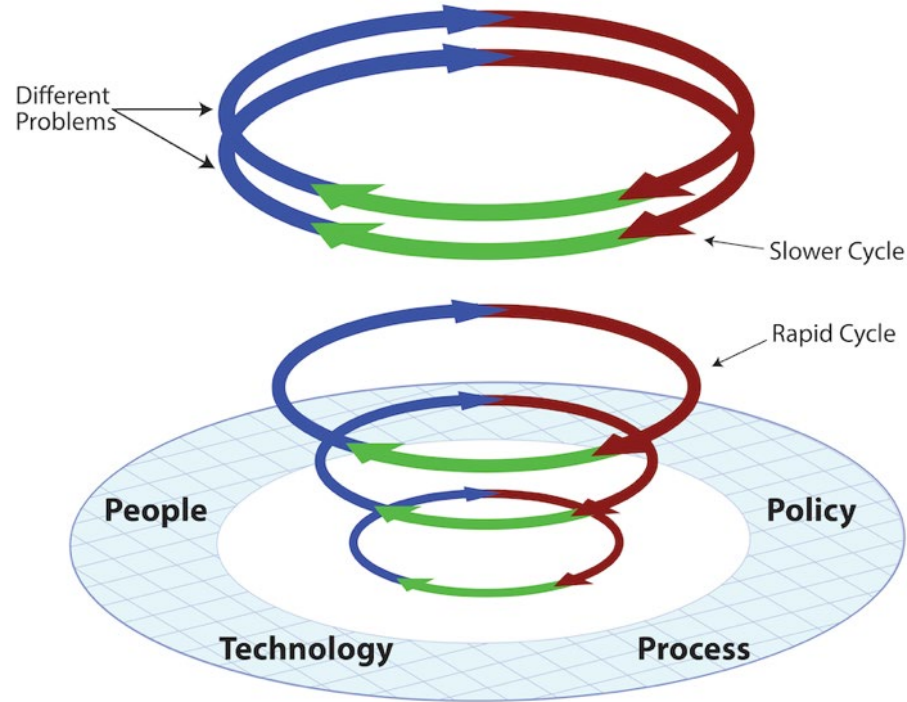


- No, you build a:





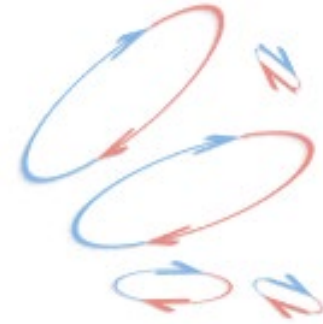
# A Learning Health *System* is a Collection of Learning Cycles Supported by a Common Infrastructure



# Why an Infrastructure?

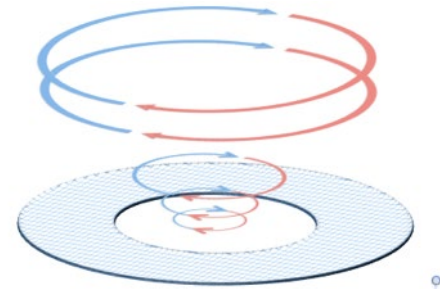
- Without an infrastructural “platform”:
  - Every cycle requires its own agreements, technology, staffing, analytics, dissemination mechanisms
  - No economy of scale

Cost of 10 cycles = 10 x  
(Cost of one)

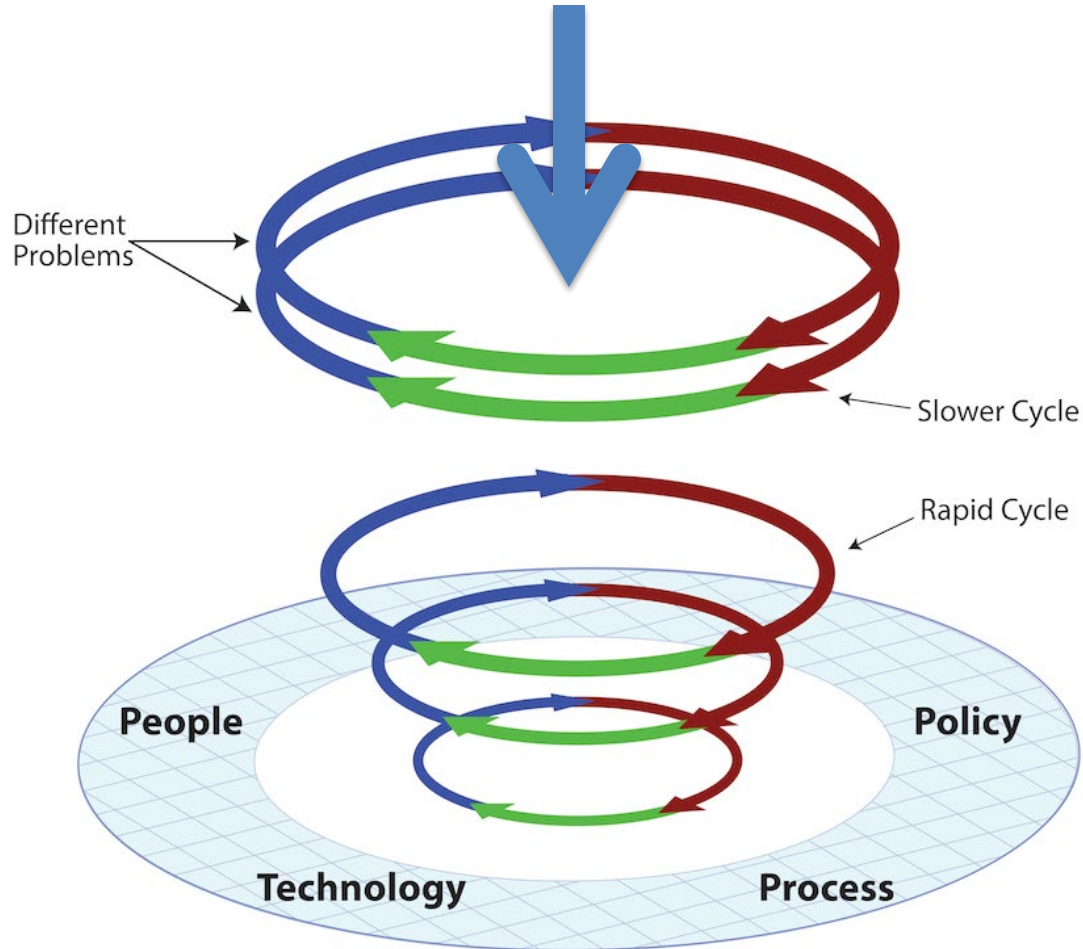


- With a “platform”:
  - All cycles are supported by the infrastructure
  - Big economy of scale

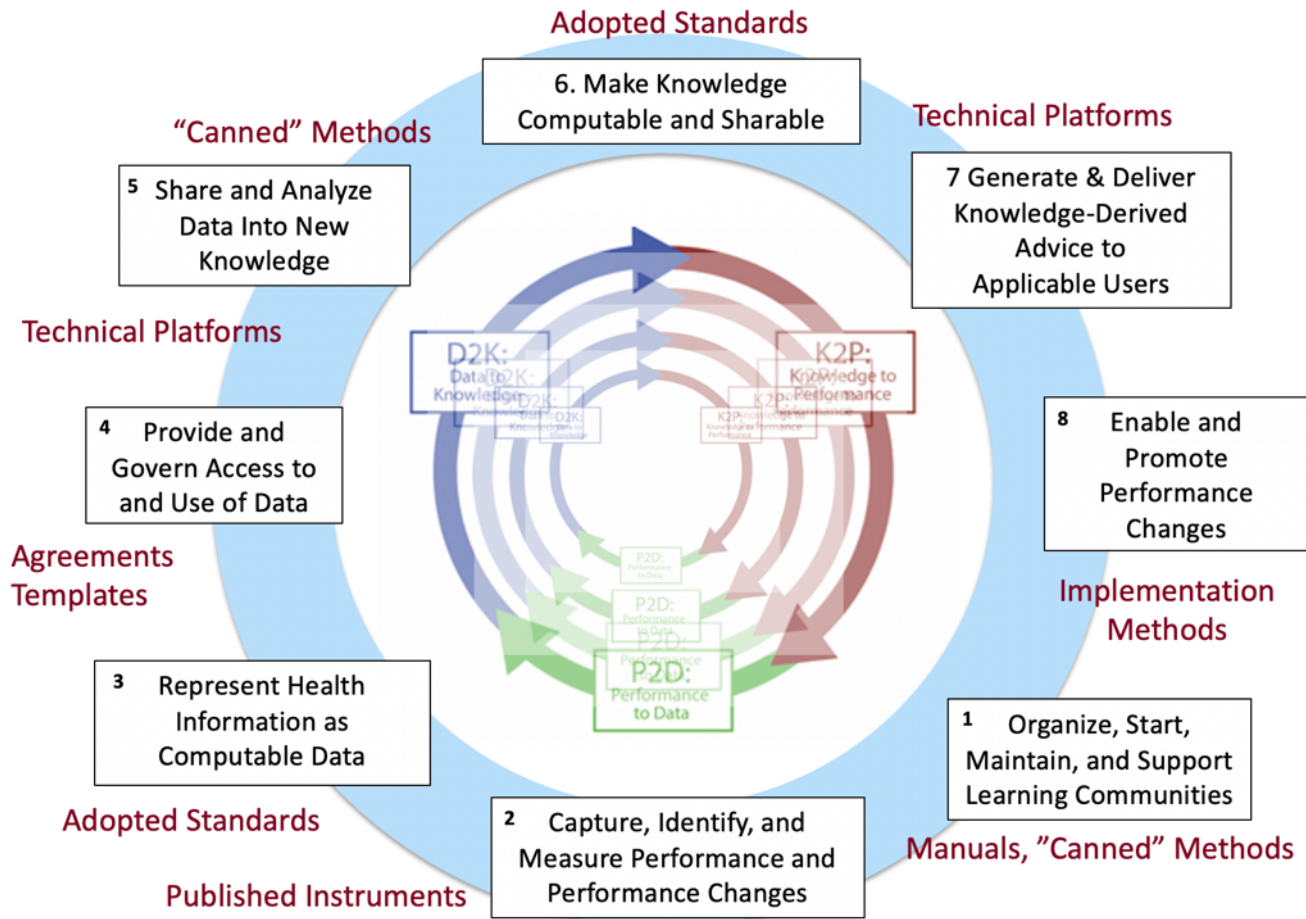
Cost of 10 cycles  $\ll$  10 x  
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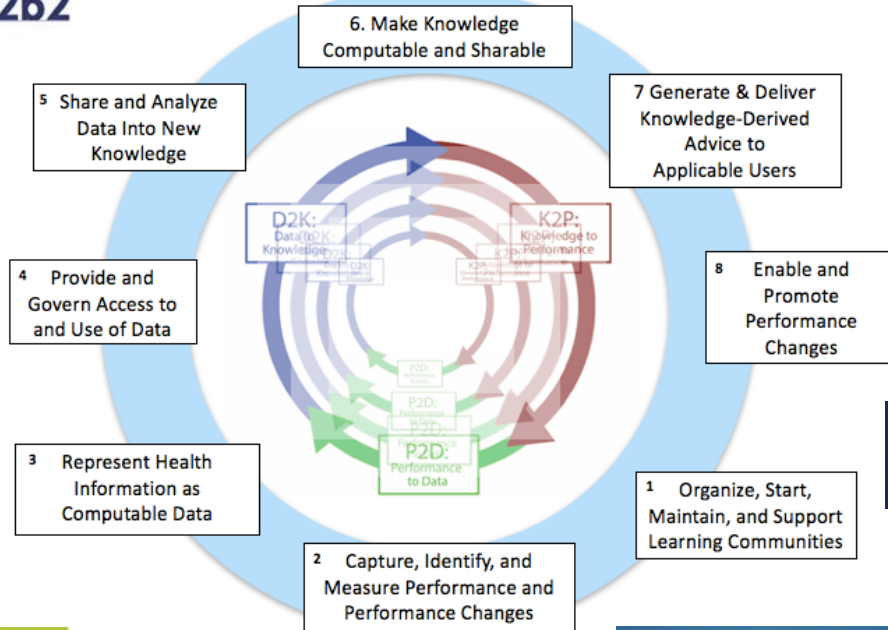
# Let's Look "Top Down"



# Infrastructure as Interconnected *Socio-Technical* Services



# Many Open Infrastructure Components Already Exist: We Need More



OPERATIONALIZING A  
LEARNING COMMUNITY  
FOR A LEARNING  
HEALTH SYSTEM:  
A Practical Guide

Deliberative Dialogue

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# LHS Initiatives at all Scales!

## Single Organizations



- Intermountain
- Geisinger
- Mayo
- Others in progress through CTSIs

## Learning Networks



- Improve Care Now
- PEDSNet
- CancerLINQ
- Epinet (NIH)
- AHRQ & PCORI Initiatives

## States/Provinces/Regions



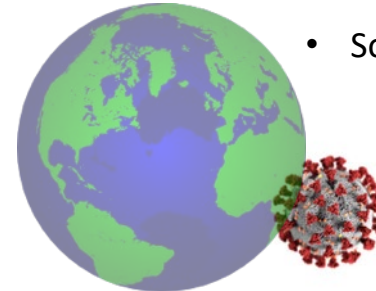
- Quebec & BC
- Michigan & Indiana

## Nations



- Switzerland
- UK: Scotland, England
- Saudi Arabia
- U.S. (VHA)

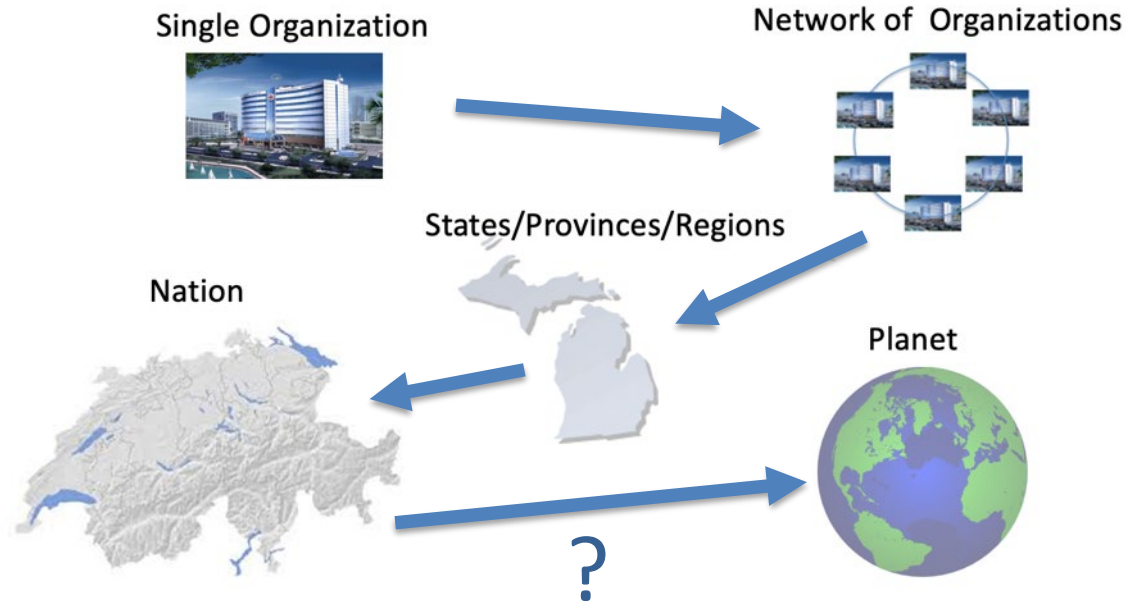
## Planet



- Someday

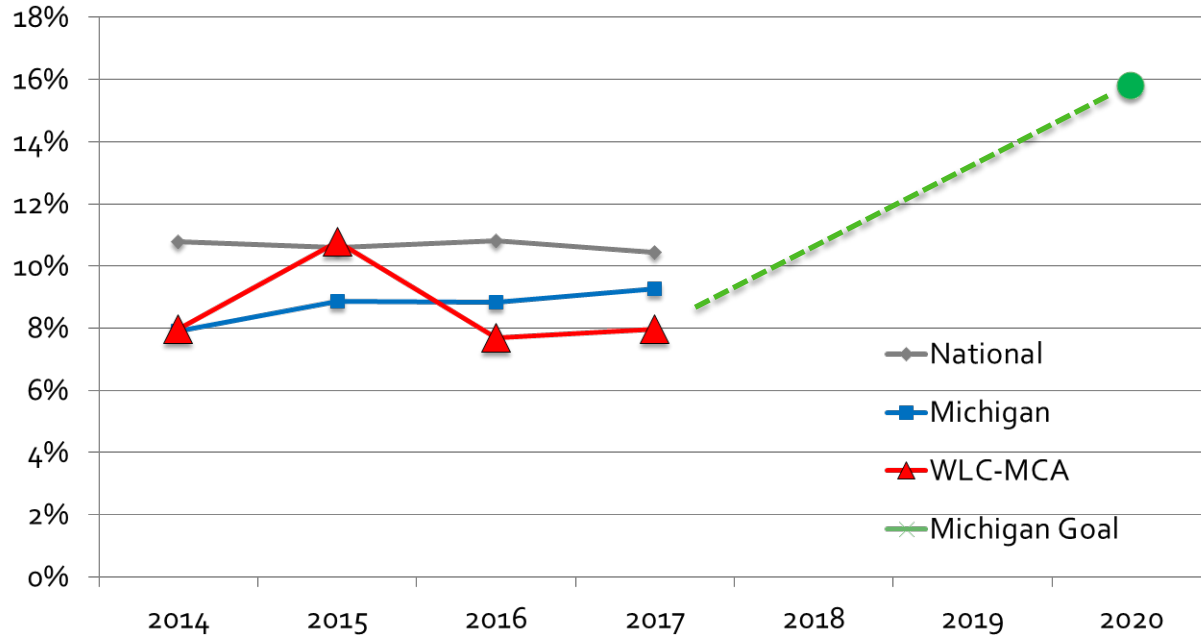
# The Trend

- Movement from smaller-scale (internally funded) LHS initiatives to larger-scale (externally/governmentally funded) initiatives





# Organizational Example: Out of Hospital Cardiac Arrest

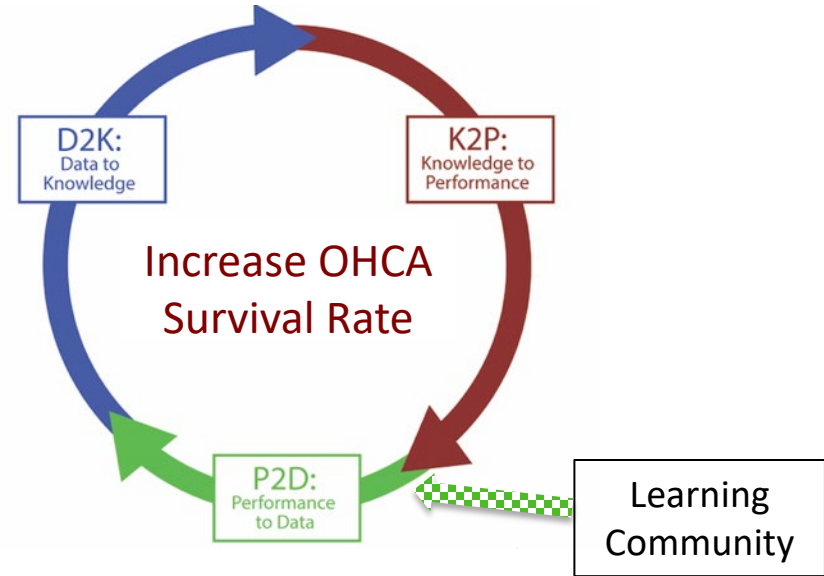


Red Line: Washtenaw-Livingston County Medical Control Authority (WLC-MCA)

Source: Cardiac Registry to Enhance Survival (CARES)

# Learning Health System Approach

Engage an Out-of-Hospital Cardiac Arrest (OHCA) Learning Community to develop a set of prioritized, high-yield interventions for shortening population-level time-to-first-treatment during OHCA



# Michigan “Cardiac Arrest” Learning Community: Pictures Worth a Thousand Words



# Discovered Intervention: A “HeartSafe Home” Community Campaign Launched June 1



**Call 911**



**Start CPR**



**Open the door**



**HeartSafe Home**  
*Plan and Practice to Survive Cardiac Arrest*

# Network Example: Improve Care Now



**Improvers wanted.**

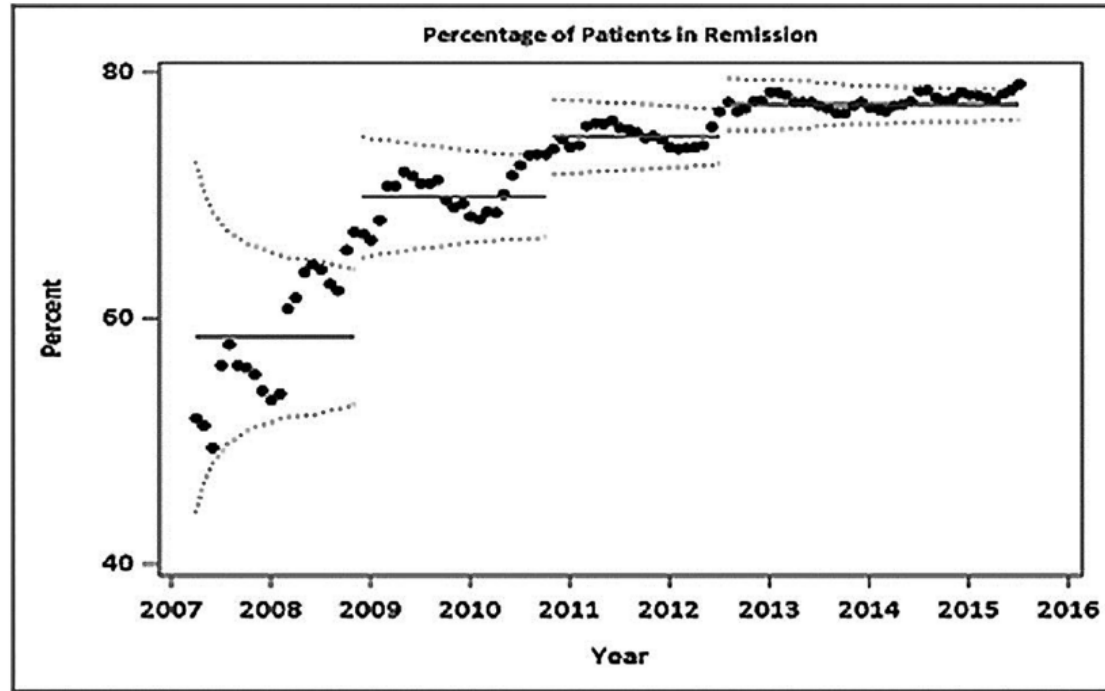
Together, we're collectively restoring the wellbeing of all kids with Crohn's disease and ulcerative colitis — changing the way medicine is practiced.

IMPROVECARENOW™

[WATCH OUR VIDEO](#)

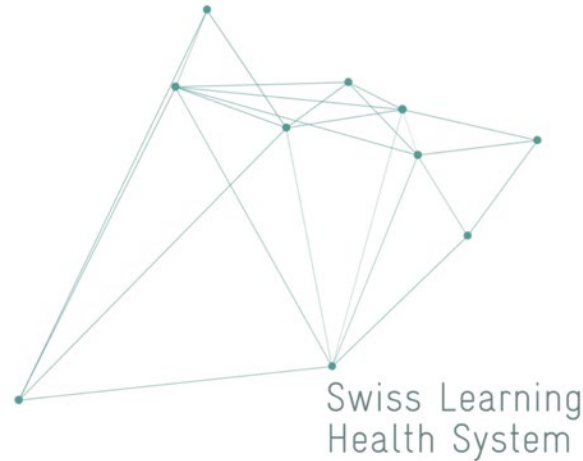
[JOIN OUR CIRCLE](#)

# “Improve Care Now” IBD Remission Findings



Britto MT, Fuller SC, Kaplan HC, et al. Using a network organisational architecture to support the development of Learning Healthcare Systems. *BMJ Qual Saf*, 2018.

# National Example: The Swiss Learning Health System



<https://www.slhs.ch/en>

EXPERIENCE REPORT

Learning Health Systems

## Swiss Learning Health System: A national initiative to establish learning cycles for continuous health system improvement

Stefan Boes<sup>1</sup> | Sarah Mantwill<sup>1</sup> | Cornel Kaufmann<sup>1</sup> | Mirjam Brach<sup>1,2</sup> |  
Jerome Bickenbach<sup>1,2</sup> | Sara Rubinelli<sup>1,2</sup> | Gerold Stucki<sup>1,2</sup>

<https://onlinelibrary.wiley.com/doi/epdf/10.1002/lrh2.10059>

# Swiss LHS

- Government funded
- Started in 2016, renewed in 2021
- Based at University of Lucerne
- Followed the general strategy:
  - Build understanding and acceptance
  - Form learning communities around important health problems
  - Establish “lightweight” governance
  - Initiate learning cycles while building out infrastructure



# National Example: Saudi Arabia Learning Health System

- Based in the Health Sector Transformation Program & Healthcare Leadership Academy
- Formal start Fall, 2022
- Multistakeholder steering committee provides governance
- Regional learning cycles focused on "burning platforms":
  - Diabetes
  - Heart disease
  - Pediatric asthma
  - Osteoarthritis

A banner with a dark blue background and a blurred image of medical equipment. The text "Health Sector Transformation Program" is written in white, bold, sans-serif font.

Health Sector Transformation  
Program



# In Closing...

- What are Learning Health Systems?  
LHSs improve health by marrying discovery to implementation, which drives further discovery
- What makes the LHS approach to health improvement different from other approaches?
  - Embraced uncertainty: no pre-commitment to an intervention
  - Learning communities: continuously engaged
  - Infrastructure: what makes the system a system, enabling economy of scale
- Status of Learning Health Systems at all levels of scale
  - Movement from smaller to larger scales as governments invest

# Relevant Publications

## Toward an Information Infrastructure for Global Health Improvement

C. P. Friedman<sup>1</sup>, J. C. Rubin<sup>1</sup>, K. J. Sullivan<sup>2</sup>

<sup>1</sup> University of Michigan

<sup>2</sup> University of Virginia

<https://www.thieme-connect.com/products/ejournals/html/10.15265/IY-2017-004>

### PERSPECTIVE

## Mind the Gap: Putting Evidence into Practice in the Era of Learning Health Systems

Jeanne-Marie Guise, MD, MPH<sup>1,2</sup>, Lucy A. Savitz, PhD, MBA<sup>3</sup>, and Charles P. Friedman, PhD<sup>4</sup>

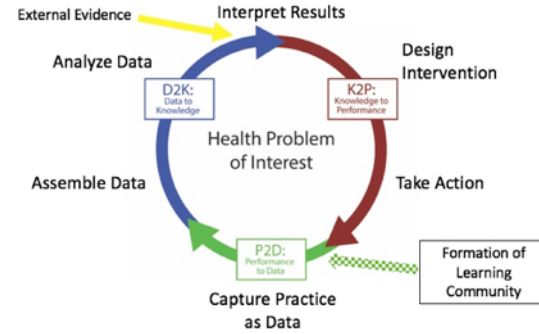
<https://link.springer.com/content/pdf/10.1007%2Fs11606-018-4633-1.pdf>

And everything in:

# Learning Health Systems

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[lhsjournal.com](http://lhsjournal.com)



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 lhs.medicine.umich.edu

