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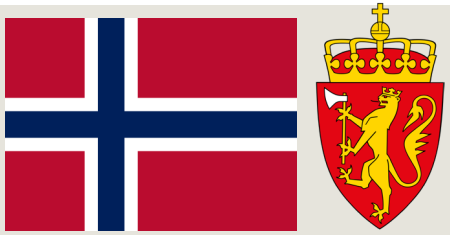

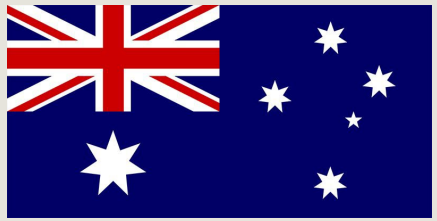

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Norwegian Healthcare as a Learning Health System

November 23, 2023 (2:00 pm - 3:15 pm)

Jeffrey Braithwaite, PhD,
FIML, FCHSM, FFPHRCP, FAcSS, Hon FRACMA, FAHMS
Professor and Director
Australian Institute of Health Innovation
Director
Centre for Healthcare Resilience and Implementation Science
President
International Society for Quality in Health Care (ISQua)

National Patient Safety Conference 2023

Workshop - November 23, 2023
Oslo, Norway

AUSTRALIAN INSTITUTE OF HEALTH INNOVATION
Faculty of Medicine, Health and Human Sciences

SHARE Center for Resilience in Healthcare
University of Stavanger

Workshop Faculty members

November 23, 2023 (2:00 pm - 3:15 pm)

Jeffrey Braithwaite, PhD
Cecilie Haraldseid-Driftland, PhD
Hilda Bø Lyng, PhD
Birte Fagerdal, MCS,
Siri Wiig, PhD

National Patient Safety Conference 2023

Workshop - November 23, 2023
Oslo, Norway

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Prologue: Are you the solution?

You all want a better Norwegian health system

Are you the solution?

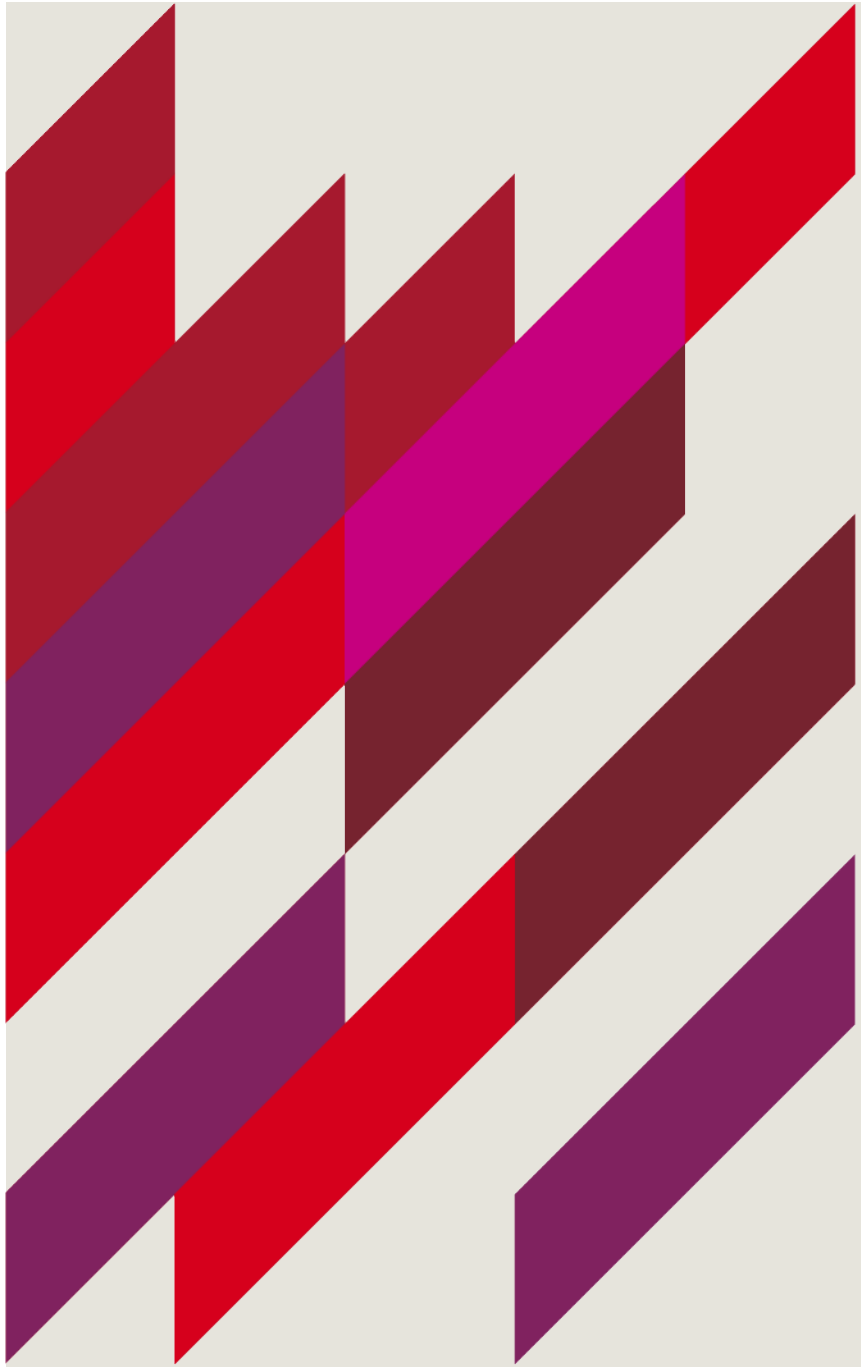
- Every one of you, even though you have a stake in wanting a better health system …
- Are in a different world, have different life experiences, different professional training and different standpoints
- So definitionally, you have different views on what to do about the future of healthcare

So let's see who you are …

- Gender: Female, Male, Non-binary, Other
- Professional background:
- Hobby when not doing health and medical research, practice, policy, etc:

So let's see what you think …

- Climate change: Believer, Sceptic, Denier
- Views about the world over the next 50 years: Optimistic, Pessimistic
- Use 1 or 2 words to describe what you would like the health system to be like by 2030



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Part 1: Overview

Thinking about LHSs

Thinking about Learning Health Systems

The Learning Health System

Examples of recent research

ISQua International Society for Quality in Health Care

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Received: 29 November 2017 | Revised: 14 February 2018 | Accepted: 20 March 2018
DOI: 10.1002/lrh2.10055

COMMENTARY

Transforming the future of health together: The *Learning Systems Consensus Action Plan*

Joshua C. Rubin[1] | Jonathan C. Silverstein[2] | Charles P. Friedman[3] | Rebecca D. H
W. Holt Anderson[7] | Allen S. Lichter[8] | Darin J. Humphreys[9] | Jeffrey Brown[10] |
Laura Crawford[11] | James M. Walker[12] | Richard L. Tannen[13] | Kate Berry[14] |
Marianne Hamilton Lopez[15] | Robert M.
Frank W. Rockhold[18]

[1] Learning Health Community, Arlington, Virginia
[2] Department of Biomedical Informatics, University of Pittsburgh Schoo
[3] Department of Learning Health Sciences, University of Michigan Med
[4] Catalysis Research, Austin, Texas
[5] Elligo Health Research, Austin, Texas
[6] Translational Research Informatics Center, Foundation for Biomedical
[7] Learning Health Strategies and NCHICA, Research Triangle Park, Nort
[8] American Society of Clinical Oncology (ASCO), Alexandria, Virginia

Learning Health System

EXPERIENCE REPORT | Open Access

A framework for understanding, des evaluating learning health systems

Tom Foley | Luke Vale

First published: 20 May 2022 | htt

MEDICAL EDUCATION ONLINE
2021, VOL. 26, 1917038
https://doi.org/10.1080/10872981.2021.1917038

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Learning health systems from an academic perspective: establishing a collaboratory within a school of medicine and health sciences

Paige L. McDonald[a], Philip Van Der Wees[a,b], Gregory C. Weaver[a], Kenneth Harwood[a], Jessica R. Phillips[a]

Learning Health Systems Open Access

EDITORIAL | Open Access

What is unique about learning health systems?

Charles P. Friedman

/10.1002/lrh2.10328 | Citations: 2

Learning Health Syster

Received: 8 November 2020 | Revised: 3 March 2021 | Accepted: 4 March 2021
DOI: 10.1002/lrh2.10265

RESEARCH REPORT

Learning Health Systems

COMMENTARY | Open Access

The science of Learning Health Syst journal

Charles P. Friedman, Nancy J. Allee, Brendan C. Delane
Kevin Sullivan, Kathleen A. Young

First published: 29 November 2016 | https://doi.org/10.1002/lrh2.10020 | Citations: 53

Learning health systems: A review of key topic areas and bibliometric trends

Chiara Pomare[1] | Zeyad Mahmoud[1] | Alex Vedovi[1,2] | Louise A. Ellis[1,2] |
Gilbert Knaggs[1,2] | Carolynn L. Smith[1,2] | Yvonne Zurynski[1,2] |
Jeffrey Braithwaite[1,2]

Learning Health Systems Open Access

GUEST EDITOR COMMENTARY | Open Access

Patient empowerment and the Learning Health System

Joshua C. Rubin

First published: 09 June 2017 | https://doi.org/10.100

Open access Original re

BMJ Open

Identifying requisite learning health system competencies: a scoping revie

Paige L McDonald,[1] Jessica Phillips,[1] Kenneth Harwood,[2] Joyce Maring
Philip J van der Wees[1,4]

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JMIR Med Inform. 2022 Feb; 10(2): e34907.
Published online 2022 Feb 23. doi: 10.2196/34907

PMCID:
PM

The Science of Learning Health Systems: Scoping Review of Empirical Resea

Monitoring Editor: Christian Lovis

Reviewed by Vasa Curcin and Michael Seid

l Sarkies, PhD,[1] Kate Churruca, PhD,[1] Genevieve Dammery, BSc (Hons),[1]
,[1] Carolynn L Smith, PhD,[1] Chiara Pomare, PhD,[1] Zeyad Mahmoud, PhD,[1]
Jeffrey Braithwaite, PhD[1]

BJGP British Journal of General Practice
bringing research to clinical practice

Editorials

High-performing primary care: reinvigorating general practice as a learning health system

Darran Foo, Janani Mahadeva, Francisco Lopez, Louise A Ellis, Kate Churruca, Genevieve Dammery, Simon Willcock and Jeffrey Braithwaite

LEARNING HEALTH COMMUNITY

So let's see what you think …

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I don't know much LHSs but I'm here to learn:

Strongly agree		Neutral		Strongly disagree
5	4	3	2	1

So let's see what you think …

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LHSs have taken off in my region:

Strongly agree		Neutral		Strongly disagree
5	4	3	2	1

Can we address the challenges for healthcare to 2030 through the creation of a Learning Health System?

The Learning Health Systems Framework

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Dimensions	Characteristics
Science and informatics	Real time access to knowledge
	Digital capture of the care experience
Patient-clinician partnerships	Engaged, empowered patients
Incentives	Incentives aligned for value
	Full transparency
Continuous learning culture	Leadership-instilled culture of learning
	Support system competencies

To which we added

Dimensions	Characteristics
Structure and Governance	Organisation

The Learning Health Systems Framework

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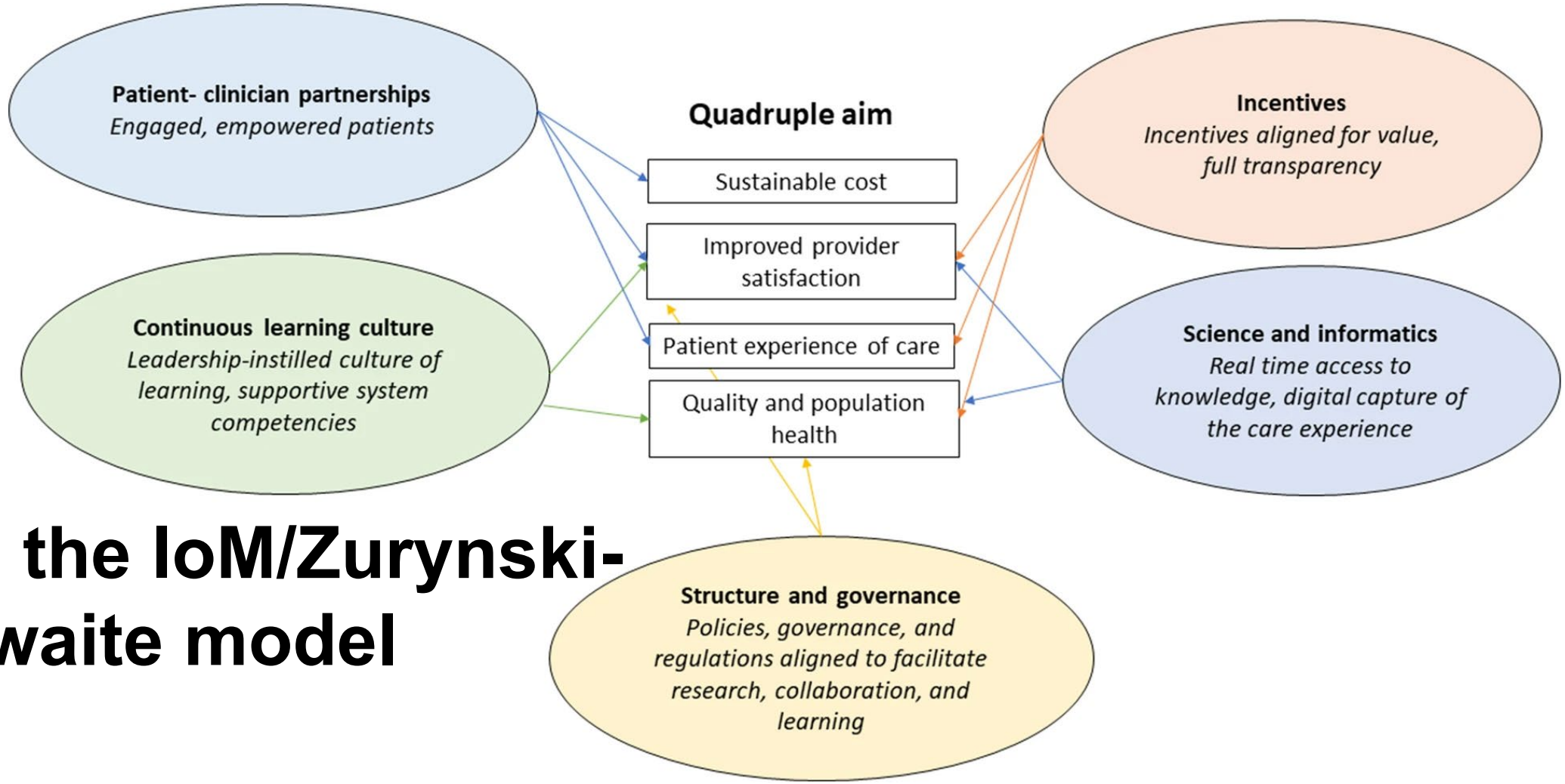
Now we have these five dimensions…



This is the IoM/Zurynski-Braithwaite model

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Part 2: What's the problem we're trying to solve?

Longstanding challenges

The problem

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- It takes an average of 17 years for only 14% of new discoveries to enter practice
- Roughly 60% of care is in line with evidence or consensus-based guidelines
- About 30% of health care is waste of some kind
- Around 10% of patients are harmed when receiving care

[Westfall, JM et al. Practice-Based Research—"Blue Highways" on the NIH Roadmap. JAMA.; Braithwaite, J et al. The three numbers you need to know about healthcare: the 60-30-10 Challenge. *BMC Med*.]

Need a Learning Health System?

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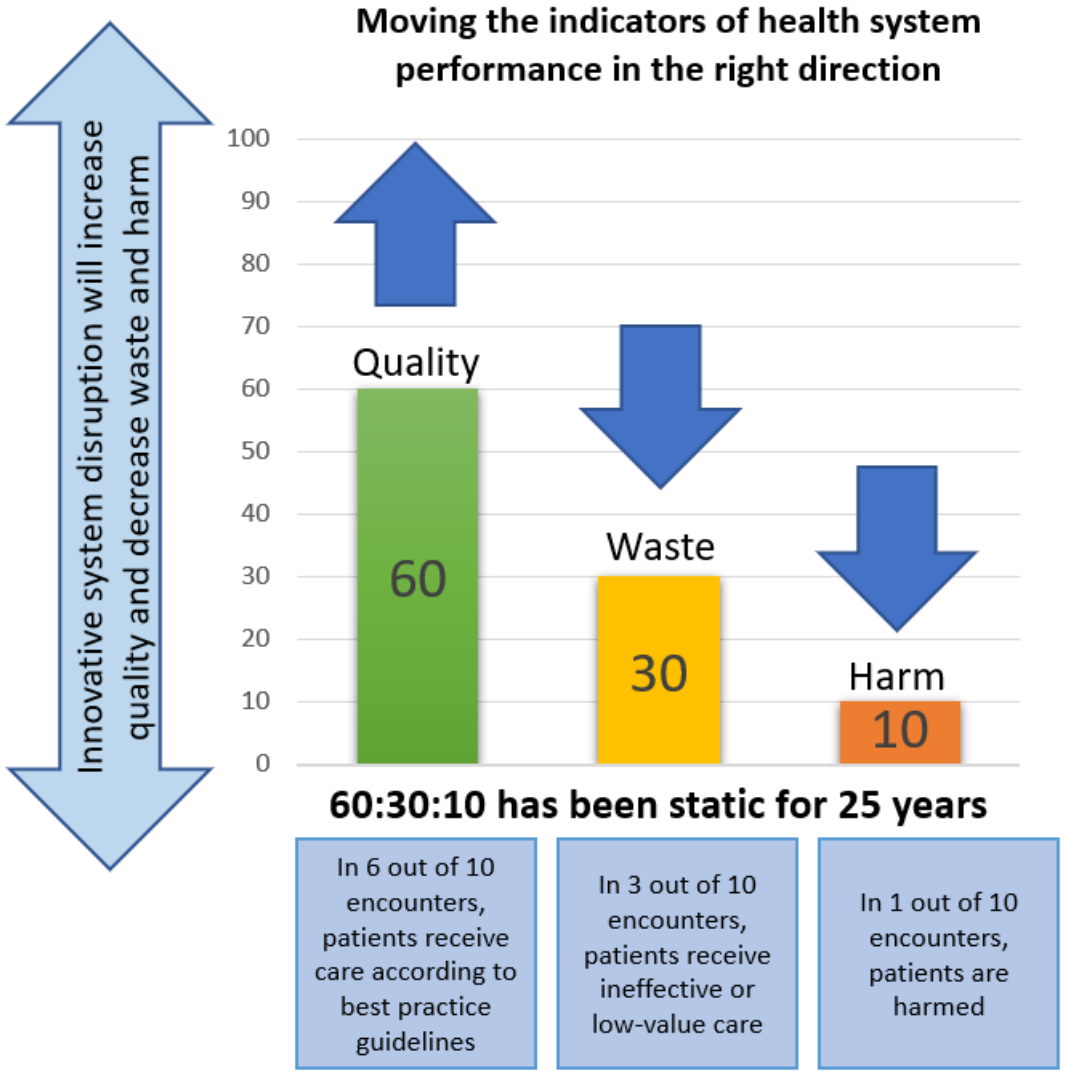
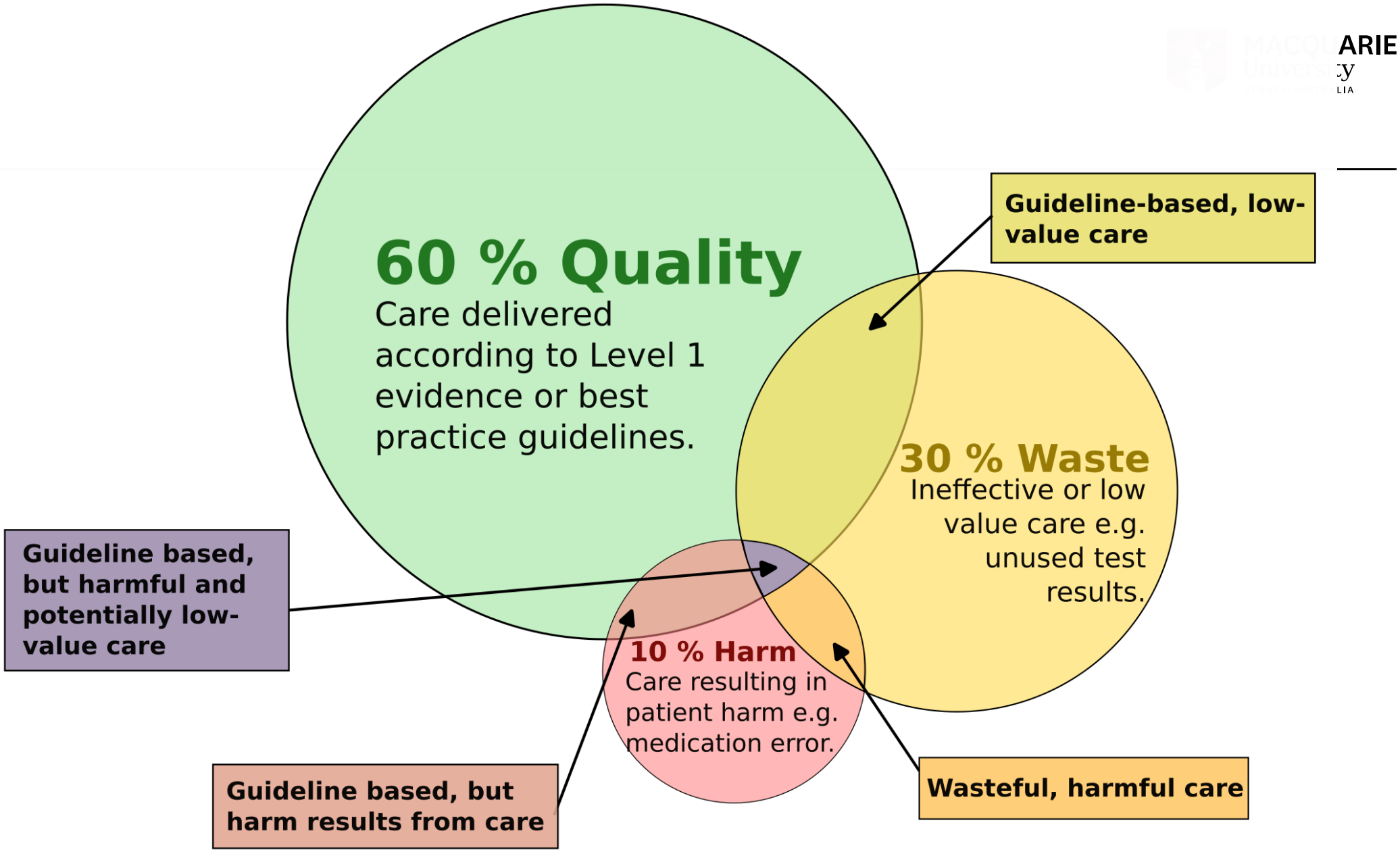


[Braithwaite, J., Glasziou, P. & Westbrook, J. The three numbers you need to know about healthcare: the 60-30-10 Challenge. *BMC Med* 18, 102 (2020). https://doi.org/10.1186/s12916-020-01563-4]



[Westfall et al. 2007, JAMA; de Vries et al. 2008, Qual Saf Health Care; Runciman et al. 2012, MJA; Braithwaite et al. 2018, JAMA; Braithwaite et al. 2020, BMC Med]

A system frozen in time?

- 60:30:10 challenge
- Change is often top-down (e.g. issuing more policy, introducing more stringent measures, etc.)
- Must move towards a learning health system
- Effective change must factor in a system's complexity
- Recognise the challenges of implementing change in a CAS

[Braithwaite J. 2018. *BMJ* 361:k2014.]

So that's the problem we're trying to solve with an LHS

- There are many other 'solutions' that have been advanced
- Such as …

A “solution” - the knowledge pipeline

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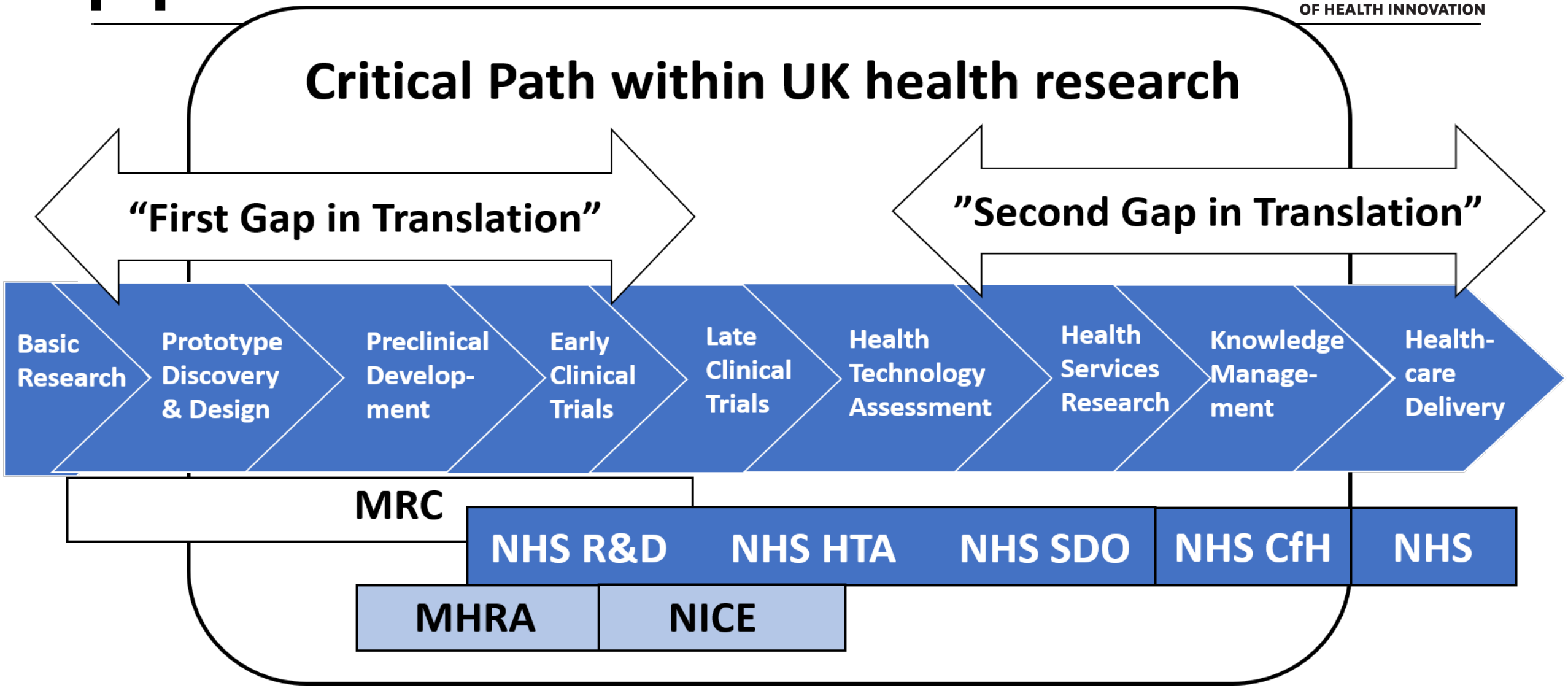

[Cooksey. 2006. A review of UK health research funding]

But the pipeline is an idealisation

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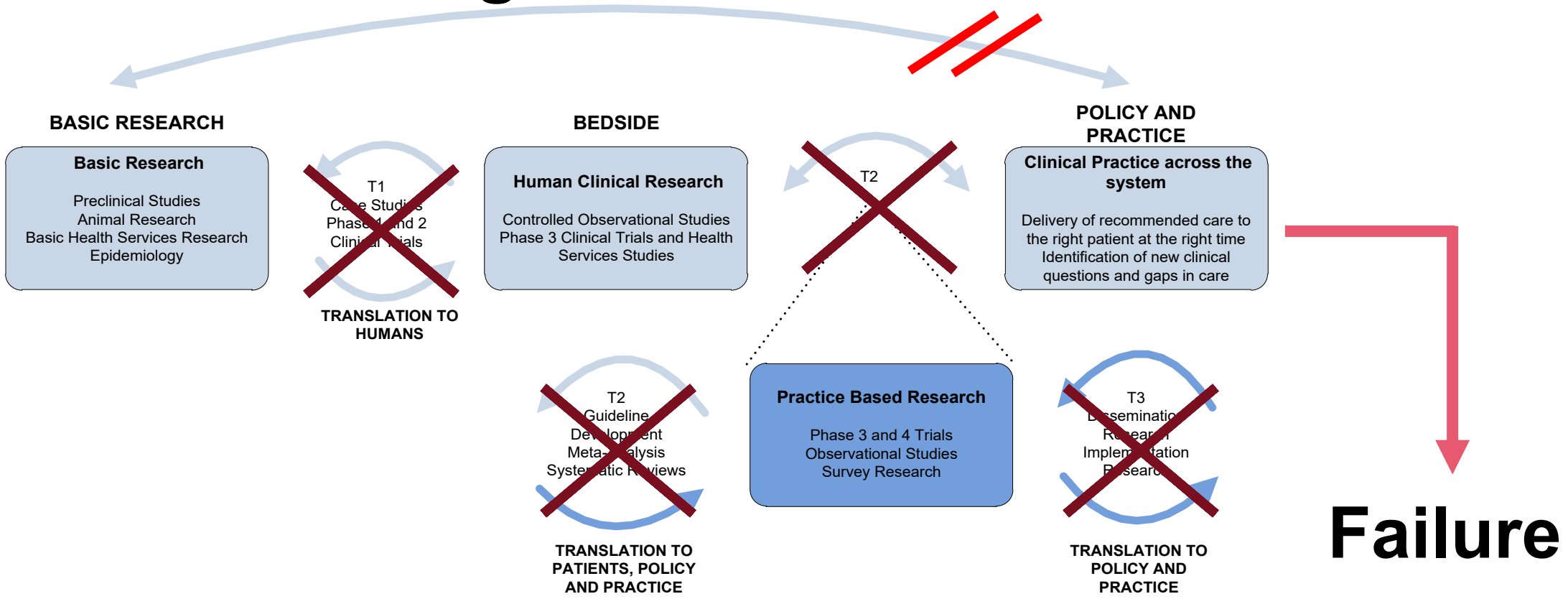
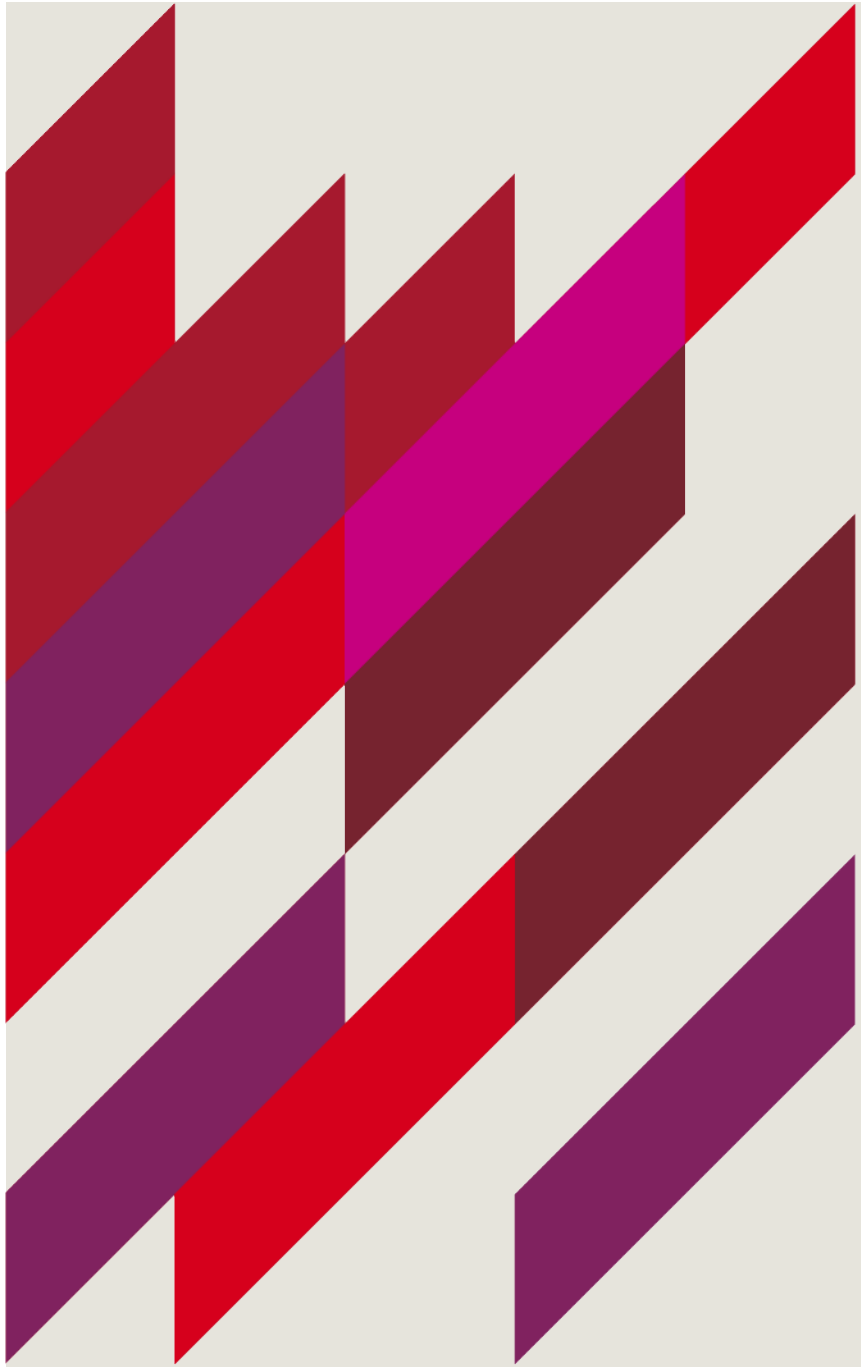
Blockages and fractures



[Westfall, et al. 2007. Practice-based research]



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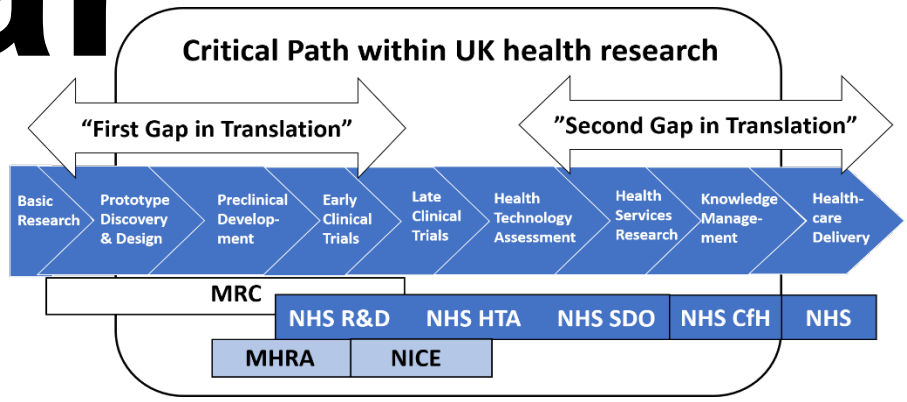
Part 3: Another challenge is its's a complex system

Applications to healthcare

The pipeline model suggests solutions are linear



But the health system is complex – incredibly complex

Complex systems are everywhere

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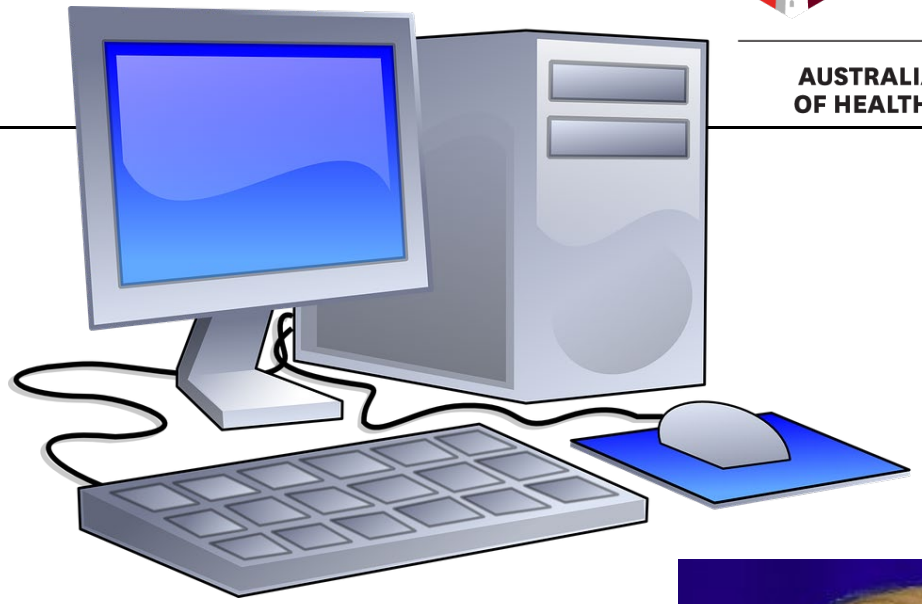

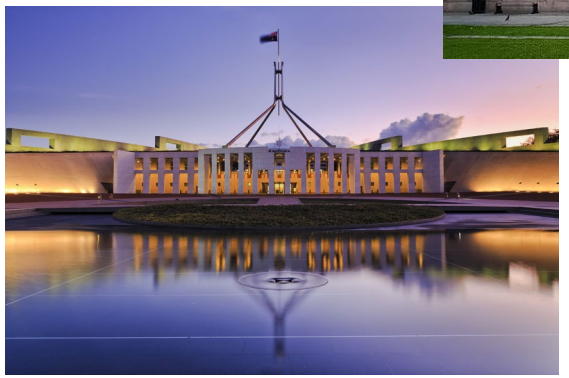

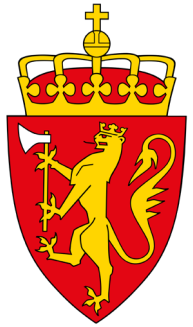

Examples in healthcare

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Simple

Complicated

Complex

Chaotic

So: how does care actually work?

Complexity Science in Health Care: *A White Paper*

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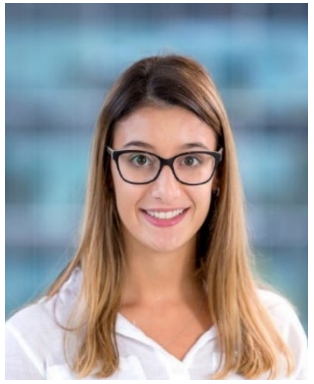

Key features of complexity in health care

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1. Populations of agents + artefacts
2. Interacting
3. Dynamically
4. With emergent rules and governance mechanisms, and bottom-up networks

Collaborations of Translational Cancer Research Network (TCRN)

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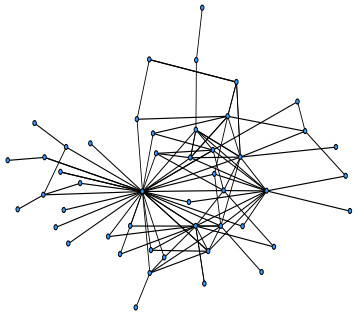
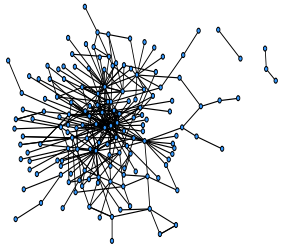
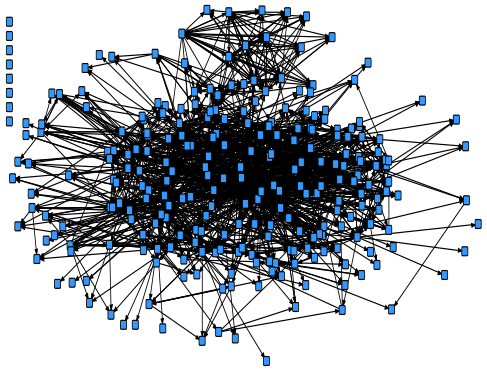
2012



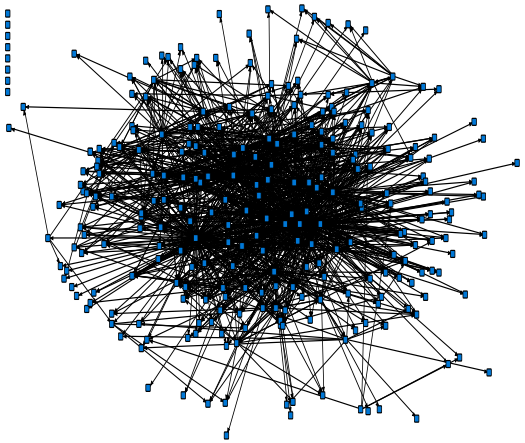
2013



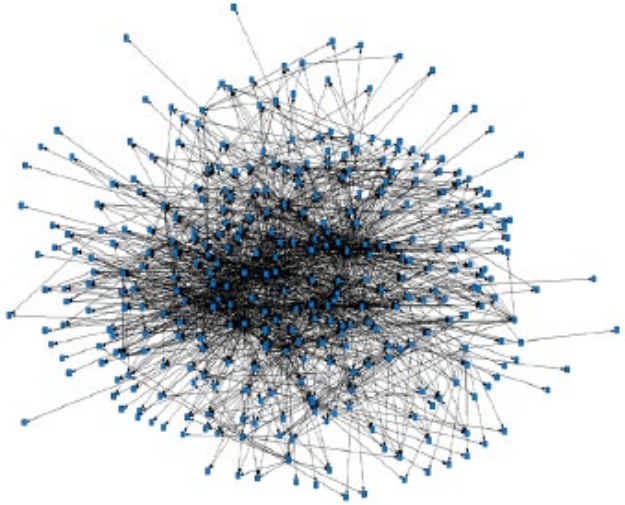
2015



2017



2021



Each dot represents a TCRN member, each line a collaborative tie.

[Source: Long et al., 2016. Implement Sci.]

Creating a learning community with Australian Genomics

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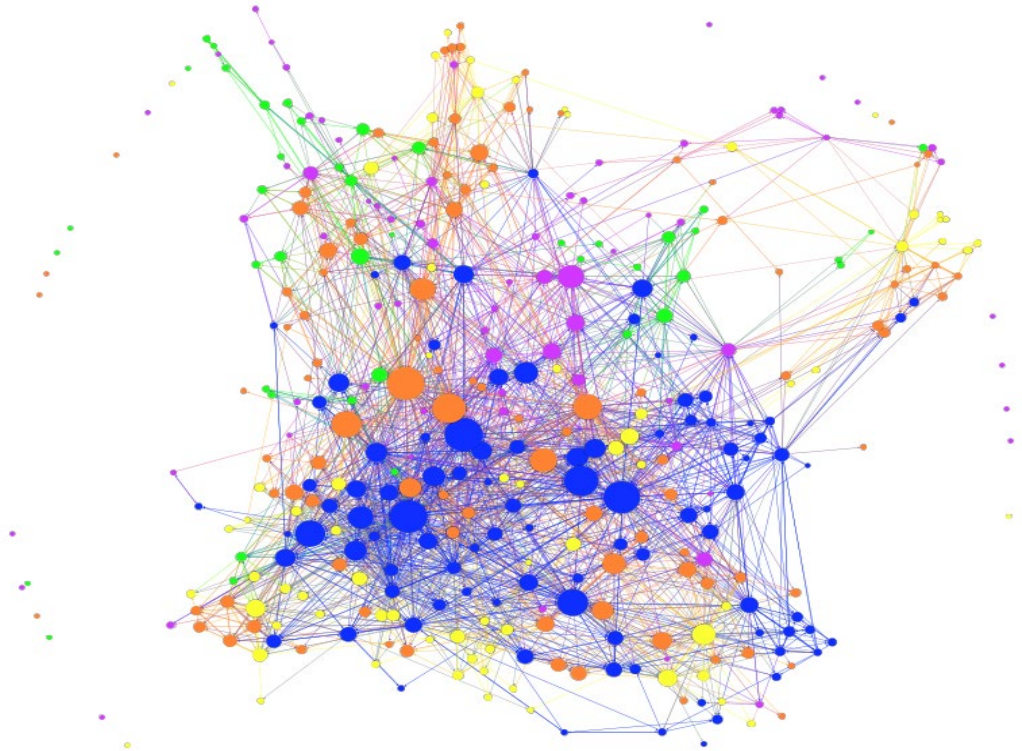
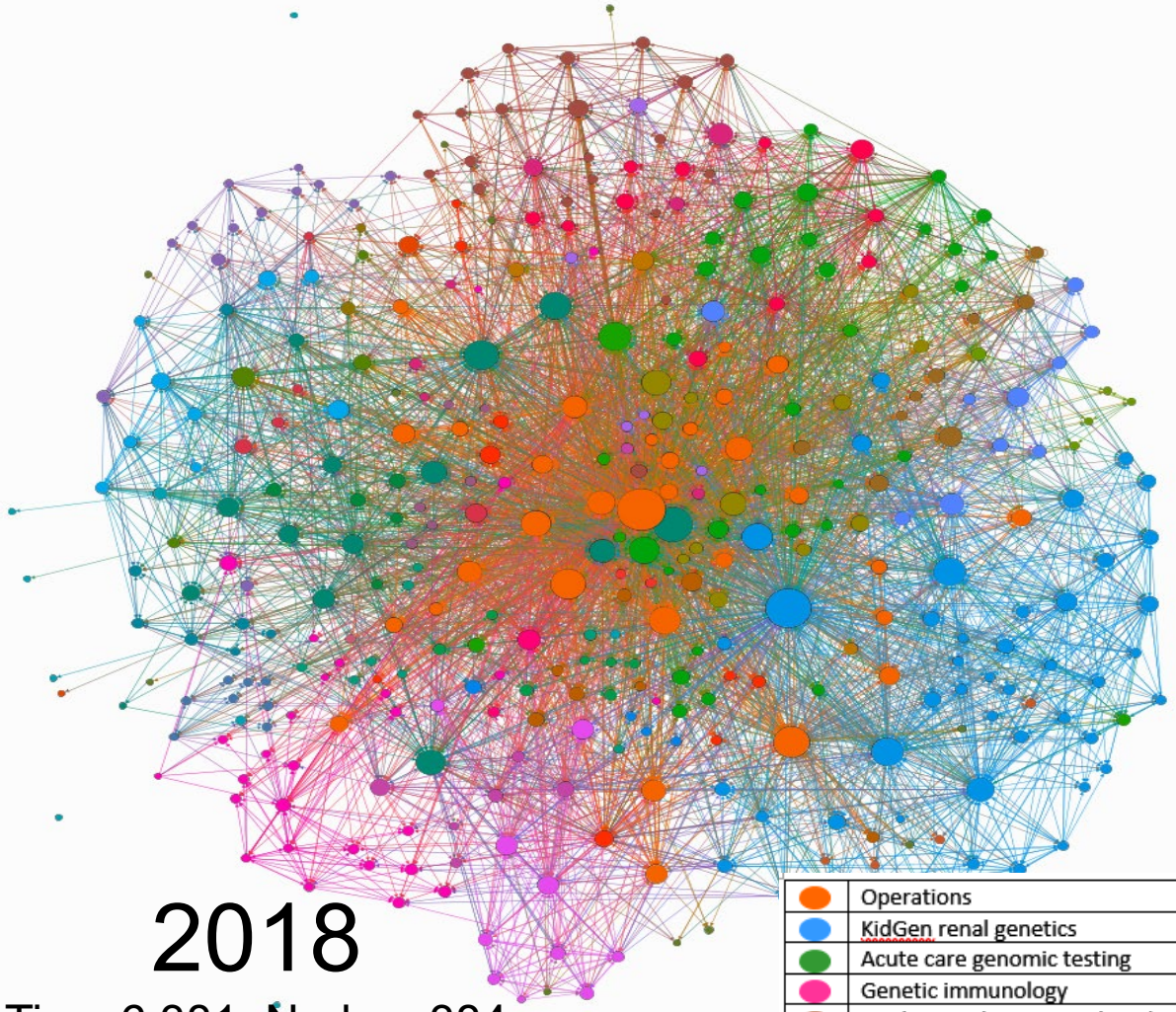


Pre-2016

(before Australian Genomics)
Ties=2,925; Nodes=384

	Medical scientist
	Genetic specialist
	Other
	Medical specialist
	Researcher



2018

Ties=6,381; Nodes=384

	Operations
	KidGen renal genetics
	Acute care genomic testing
	Genetic immunology
	Cardiovascular genetic disorders
	National steering committee
	Acute lymphoblastic leukemia

Look at something as defined as a disease, there's more complexity …

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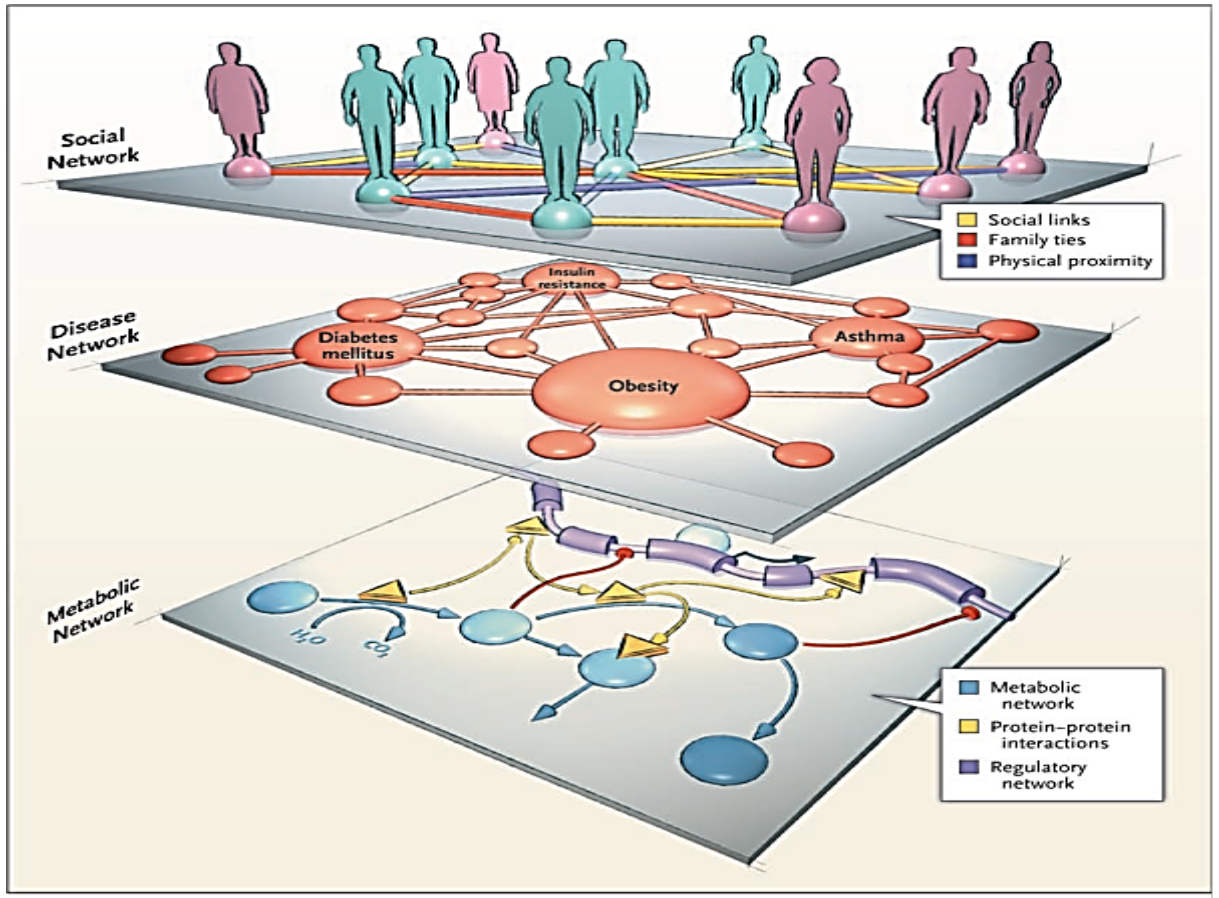

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Figure has been redrawn and type has been reset.
Please check carefully.

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A group exercise on trust

Discussions in small groups

How important is trust in LHSs?

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1. Discuss this key question in your group

2. We will ask a selection of participants to report back to us

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Part 4: More about Learning Health Systems

Going deeper: definitions, frameworks and empirical evidence

Defining a Learning Health System

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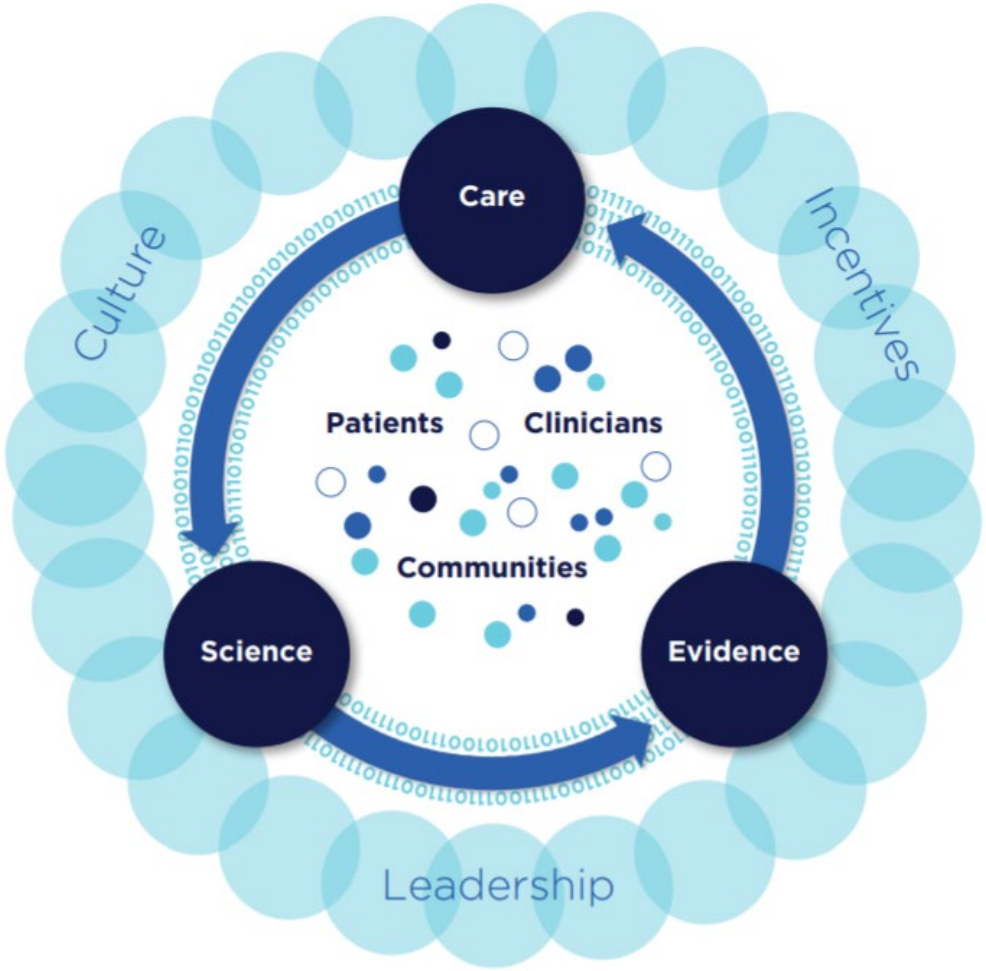

A Learning Health System is a system in which *"Science, informatics, incentives, and culture are aligned for continuous improvement and innovation, with best practices seamlessly embedded in the care process, patients and families active participants in all elements, and new knowledge captured as an integral by-product of the care experience".* (Institute of Medicine, 2007)

[Source: Institute of Medicine. Best Care at Lower Cost: The Path to Continuously Learning Health Care in America. Washington (DC): The National Academies Press; 2013.]

Learning Health Systems: A review of key topic areas and bibliometric trends (2022)

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Received: 8 November 2020 | Revised: 3 March 2021 | Accepted: 4 March 2021
DOI: 10.1002/lrh2.10265

RESEARCH REPORT

Learning Health Systems

Learning health systems: A review of key topic areas and bibliometric trends

Chiara Pomare[1] | Zeyad Mahmoud[1] | Alex Vedovi[1,2] | Louise A. Ellis[1,2] | Gilbert Knaggs[1,2] | Carolynn L. Smith[1,2] | Yvonne Zurynski[1,2] | Jeffrey Braithwaite[1,2]

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Funding information
National Health and Medical Research Council, Grant/Award Numbers: 9100002, APP1176620AQ6

Abstract

Introduction: The emergent field of learning health systems (LHSs) has been rapidly evolving as the concept continues to be embraced by researchers, managers, and clinicians. This paper reports on a scoping review and bibliometric analysis of the LHS literature to identify key topic areas and examine the influence and spread of recent research.

Methods: We conducted a scoping review of LHS literature published between January 2016 and May 2020. The authors extracted publication data (eg, journal, country, authors, citation count, keywords) and reviewed full-texts to identify: type of study (empirical, non-empirical, or review), degree of focus (general or specific), and the reference used when defining LHSs.

Results: A total of 272 publications were included in this review. Almost two thirds (65.1%) of the included articles were non-empirical and over two-thirds (68.4%) were from authors in the United States. More than half of the publications focused on specific areas, for example: oncology, cardiovascular care, and genomic medicine. Other key topic areas included: ethics, research, quality improvement, and electronic health records. We identified that definitions of the LHS concept are converging; however, many papers focused on data platforms and analytical processes rather than organisational and behavioural factors to support change and learning activities.

Conclusions: The literature on LHSs remains largely theoretical with definitions of LHSs focusing on technical processes to reuse data collected during the clinical process and embedding analysed data back into the system. A shift in the literature to empirical LHS studies with consideration of organisational and human factors is warranted.

KEYWORDS
bibliometrics, healthcare, learning health systems, learning healthcare systems

1 | INTRODUCTION

Contemporary health systems are not fit for purpose. Even in the most developed countries less than two-thirds of healthcare delivered is in line with evidence-based guidelines (60%); one third of care is some form of waste (30%) and one tenth (10%) of it is associated with an adverse event.[1] These numbers have persisted for decades despite substantial efforts and resources dedicated to improving the safety

- We conducted a scoping review of 272 included papers
- 65.1% of articles were non-empirical
- 68.4% from US-based authors
- We found that definitions of the LHS are converging
- Most papers focus on data platforms, rather than organisational and behavioural factors

[Pomare, C, Mahmoud, Z, Vedovi, A, et al. Learning health systems: A review of key topic areas and bibliometric trends. *Learn Health Sys*. 2022; 6:e10265. https://doi.org/10.1002/lrh2.10265]

The Learning Health Systems Framework

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Buzz with your neighbour …

Is this a model you can use - the IoM/Zurynski-Braithwaite model?

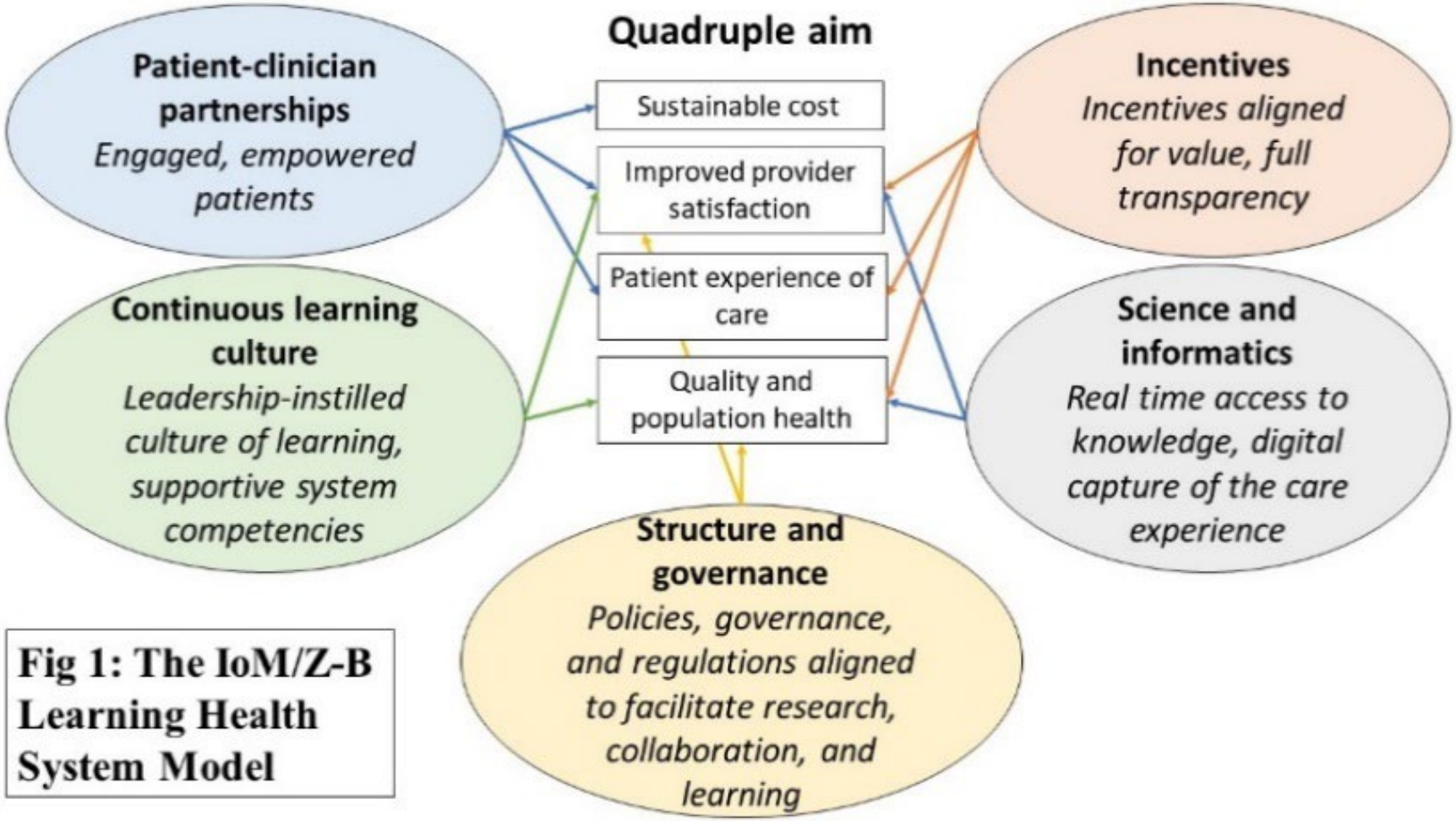

Fig 1: The IoM/Z-B Learning Health System Model

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Part 5: LHS case studies

Selected exemplars

Case study: Veterans Health Administration (VHA)

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- The VA provides healthcare to 9 million military veterans each year and is the largest publicly funded healthcare delivery system in the USA.
- It consists of 1,293 healthcare facilities including 171 medical centres and 1,112 outpatient sites

VA | U.S. Department of Veterans Affairs

Case study: Veterans Health Administration (VHA)

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Science and informatics		Patient-clinician partnerships	Incentives		Culture	
Real time access to knowledge	Digital capture of the care experience	Engaged, empowered patients	Incentives aligned for value	Full transparency	Leadership-instilled culture of learning	Supportive system competencies
National Corporate Data Warehouse enabling performance tracking Providing clinicians with access to multiple dashboards to track quality relative to their peers.	Systemwide eHRs Daily processing of more than two million lab results 500,000 pharmacy fills, and 400,000 patient encounters	My HealtheVet web portal allows patients to access and update their health records, schedule appointments, and refill prescriptions	Clinicians are paid a salary so that remunerations is not based on care volume	Public reporting of large amounts of data on quality for both self-auditing purposes and for the benefit of unaffiliated researchers. Providing clinicians with access to multiple dashboards to track quality relative to their peers	Academic affiliations in larger VHA hospitals, with many clinicians holding dual appointments	Diffusion of Excellence Program seeks to discover how VHA facilities are rewarded for sharing their best practices and to what degree such innovations are adopted elsewhere in the system

[Zurynski Y, Smith CL, Vedovi A, Ellis LA, Knaggs G, Meulenbroeks I, Warwick M, Gul H, Pomare C, Braithwaite J. Mapping the Learning Health System: A Scoping Review of Current Evidence. Australian Institute of Health Innovation, and the NHRMC Partnership Centre for Health System Sustainability, Sydney, Australia, 2020]

Geisinger Health System

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- Geisinger Health is based in Pennsylvania and services over 3 million patients across the state, predominantly in rural areas.

Geisinger

- Geisinger aims to deliver high quality care at a low cost, with a focus on population health.

Geisinger Health System

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Science and informatics		Patient-clinician partnerships	Incentives		Culture	
Real time access to knowledge	Digital capture of the care experience	Engaged, empowered patients	Incentives aligned for value	Full transparency	Leadership-instilled culture of learning	Supportive system competencies
Robust eHR system that feeds genomic data back into the sequence and allows for data analysis to improve genetic variant annotation, creating a cycle.	Stable enrolment of patients into eHR system within a robust informatics infrastructure allowing for the tracking patient experiences and outcomes over the long term. Over 180,000 patients had consented to contribute their genomic data.	MyCode Community Health Initiative (biorepository) relies on opt-in consent, and of those approached, 85-90% agree to participate Informatics infrastructure with security requirements and stores patient data behind a system firewall to protect patient information	Paying clinicians a salary so that their remuneration is not based on care volume.	eHR and genomic data variants are reported back to patient participants, while also being deposited into publicly available databases.	The goal of establishing an LHS has been embraced by the organisation's leadership, who have aimed to develop conceptual and business models for moving toward a learning culture.	Emphasis on continual quality improvement and the promotion of best practices checklists for physicians.

The Ottawa Hospital

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- The Ottawa Hospital is a three campus acute care facility in Canada and one of the main providers of cancer treatment in the Ottawa region.

- The Ottawa Hospital operates with a transformation model. It aligns several domains: people, processes and technology.

The Ottawa Hospital

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Science and informatics		Patient-clinician partnerships	Incentives		Culture	
Real time access to knowledge	Digital capture of the care experience	Engaged, empowered patients	Incentives aligned for value	Full transparency	Leadership-instilled culture of learning	Supportive system competencies
Process monitoring and business intelligence tools allowed for the local generation of dashboards to visualise and track performance metrics at a provincial level, create alerts and queries to monitor individual and clinical team performance.	Process monitoring and business intelligence tools that integrate process-related data were also employed to establish a learning cycle and create insights on system performance.	Patients were among the stakeholder groups engaged – through interviews – in the system redesign.	N/A	Consensus approach to the initiative's creation led to general buy-in among most relevant stakeholders and their ability to access and benefit from the process monitoring and business intelligence tools implemented in the restructuring.	Reported buy-in from leaders of the academic and community hospitals.	Operating with a conceptual focus of a "health region" as a geographic unit of implementation, the OHTM brought about the establishment of a "regional Community of Practice" to engage stakeholders.

MQ Health General Practice

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- MQ Health General Practice operates across two sites and is a department of MQ Health, a not-for-profit health enterprise.
- MQ Health includes a private hospital, specialist clinics, allied health clinics, digital mental health services and an affiliation with the university's medical faculty.

MQ Health

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HEALTH SCIENCES CENTRE

MQ Health General Practice

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Science and informatics		Patient-clinician partnerships	Incentives		Culture	
Real time access to knowledge	Digital capture of the care experience	Engaged, empowered patients	Incentives aligned for value	Full transparency	Leadership-instilled culture of learning	Supportive system competencies
Access to subscription only platforms through Macquarie University. Lunchtime teaching sessions on topical health issues. Access to clinical auditing tool to provide practitioners with overview of their patient cohort.	Trialling implementation of 'MyPractice' App which provides patients with access to referrals, prescriptions, certificates. Use of online booking system.	Opportunities for patients to leave Google reviews Patient focus groups to discuss the implementation of 'MyPractice' App	Paying clinicians a salary so that their remuneration is not based on care volume.	*In progress:* the practice is in the process of designing a way to publish metrics on patient health outcomes, centred around the Quadruple Aim.	Affiliation with University medical school providing teaching and learning opportunities for staff. Research opportunities for practice staff. Opportunities for learning through educational sessions and grand rounds.	Regular meetings involving clinical and non clinical staff that address quality improvement.

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Part 6: Group Buzz

Applying LHS principles and practices to your work

In small groups …

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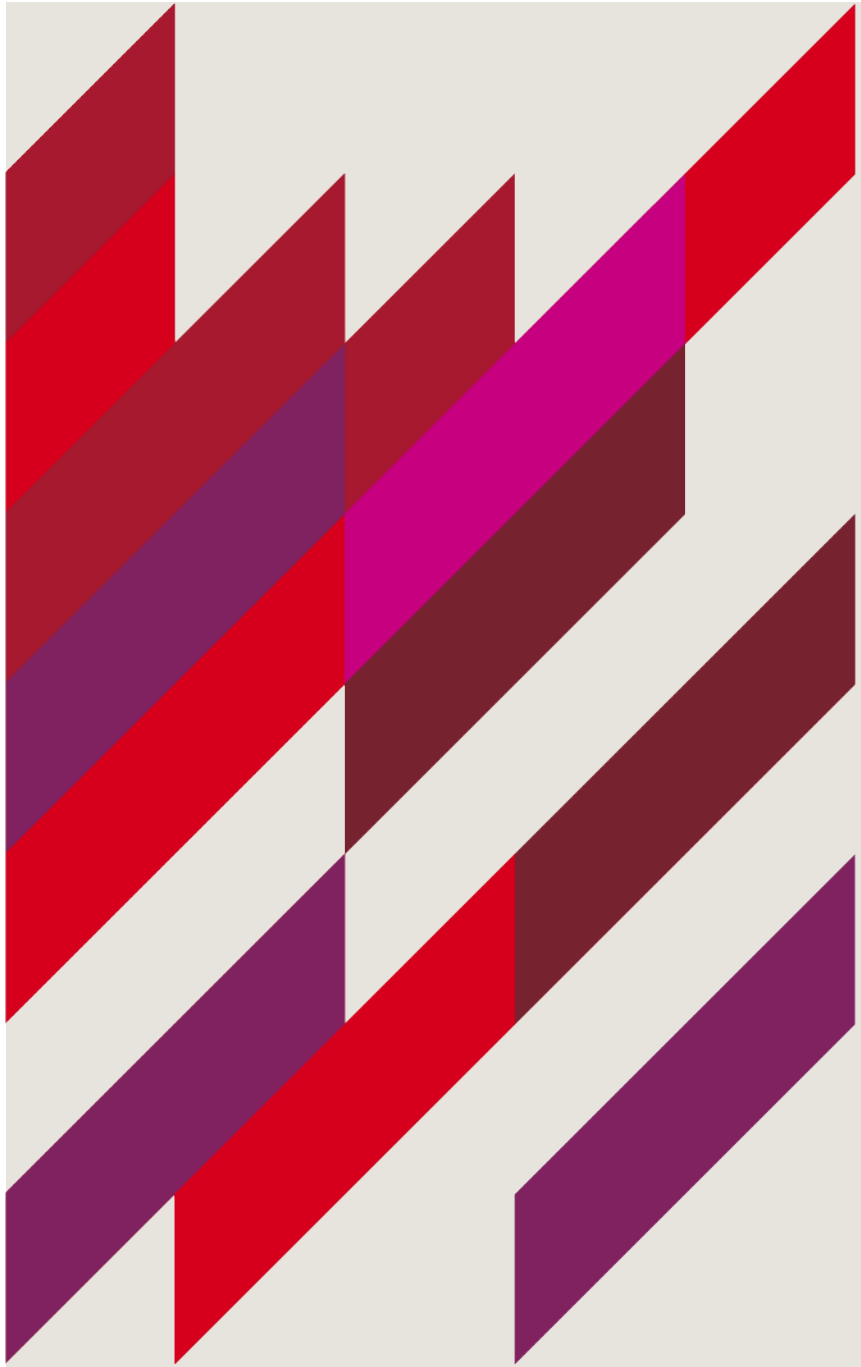
1. Buzz with others in your group

2. How will what we have presented be applied in your setting?



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Part 7: Implementing the LHS model

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A world-first launch in August, 2023

A Learning Health System Toolkit

THE LEARNING HEALTHCARE PROJECT

How do we build a Learning Health System?

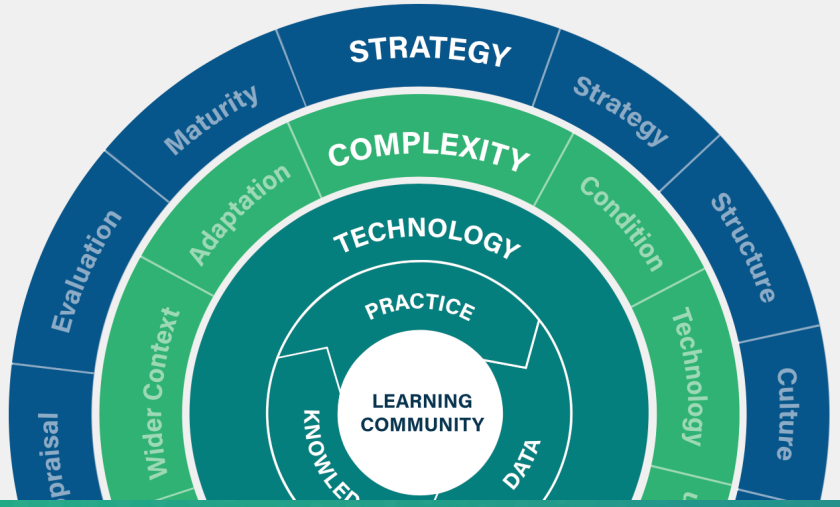
The Learning Health Systems Toolkit

HOME ABOUT FIND TOOLS ALL TOOLS SUBMIT A TOOL SEARCH TOOLS

Navigate Tools

The Wheel shows the key components of an LHS: strategy, complexity and technology. You can click on the Wheel's rings to further navigate the categories and subcategories of Tools in the toolkit. You can find more information about the key LHS components and the subject terms used at Learning Healthcare Systems website, LHS components.

CLICK ON A TILE TO EXPLORE RELATED TOOLS



Tools to help you understand and manage strategic issues within your Learning Health System

Structure Designing Organisational Structures	**Workforce** Managing Workforce Issues	**Behaviour** Achieving behaviour change
Co-Design Involving Stakeholders	**Culture** Understanding and changing organisational culture	**Evaluation** Evaluating effectiveness
Implementation Implementation Science	**Maturity** Measuring Maturity	**Strategy** Defining LHS strategy

https://lhstoolkit.learninghealthcareproject.co.uk

Models for creating LHSs through transformation

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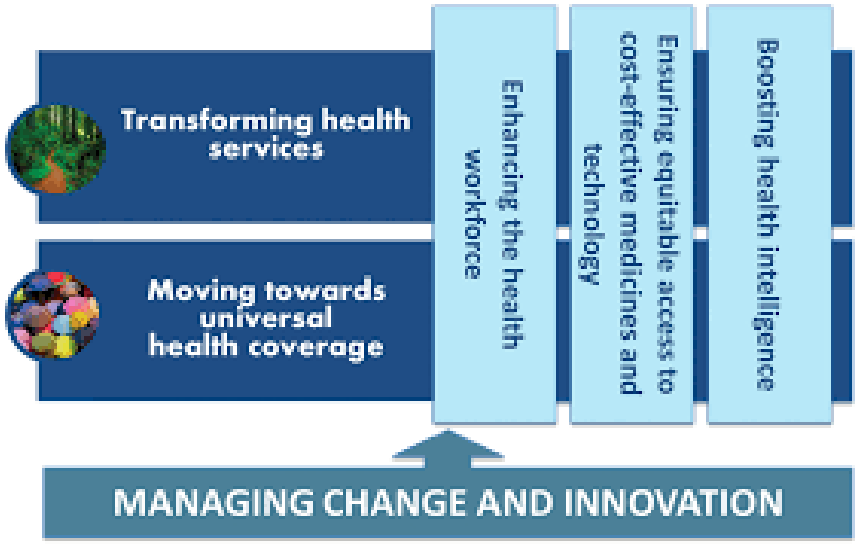
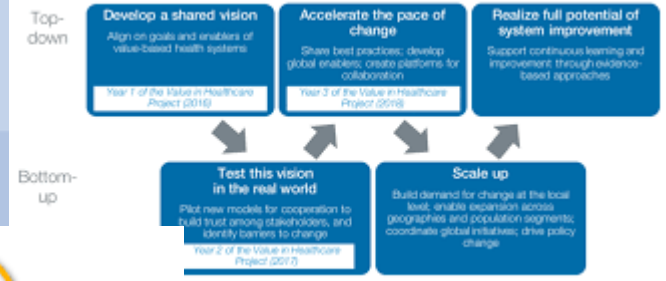
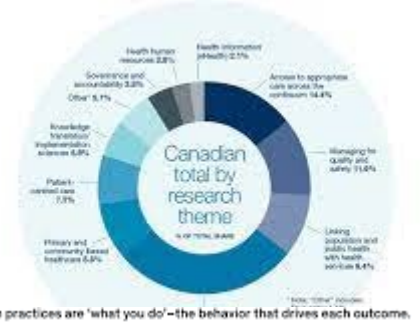
SYDNEY · AUSTRALIA

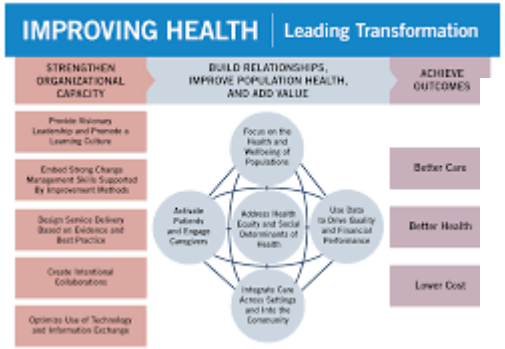
By the World Health Organisation



By lots of other people

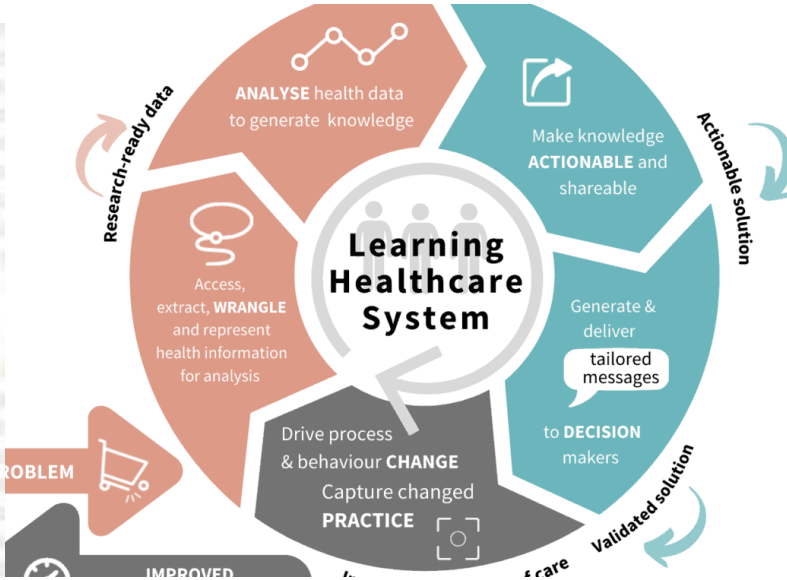


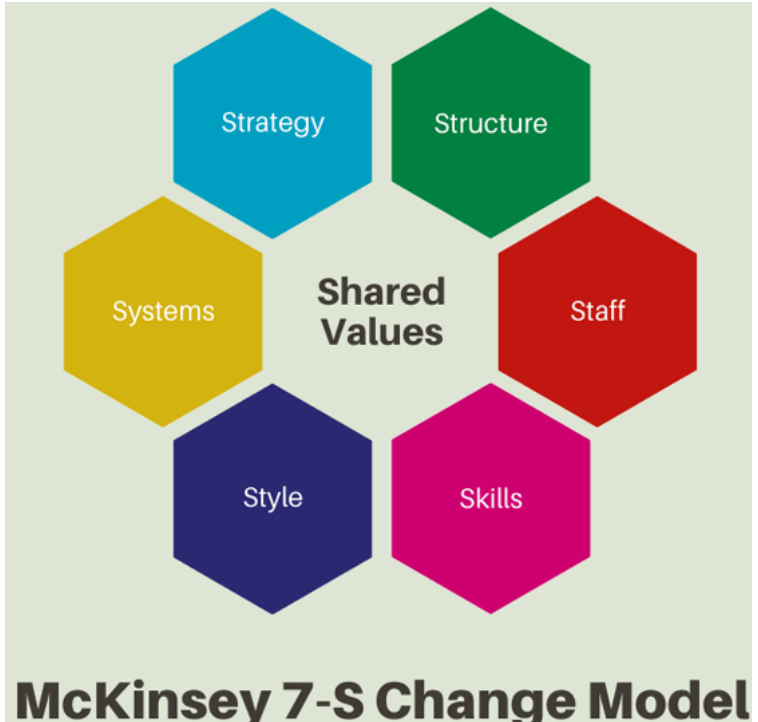




ADKAR Change Management Model

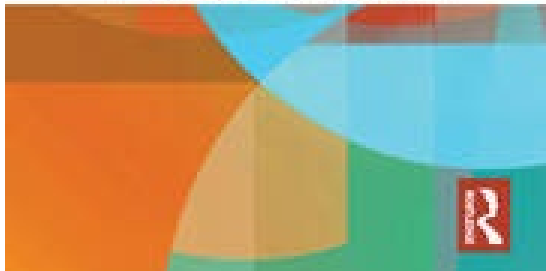
Awareness Desire Knowledge Ability Reinforcement





TRANSFORMING HEALTHCARE WITH QUALITATIVE RESEARCH

Edited by
Frances Rapport and Jeffrey Braithwaite



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Discussion: comments, questions, observations?

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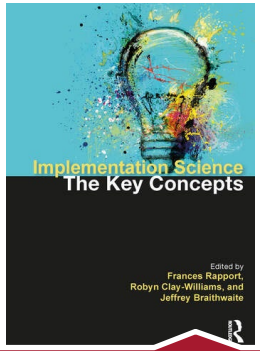
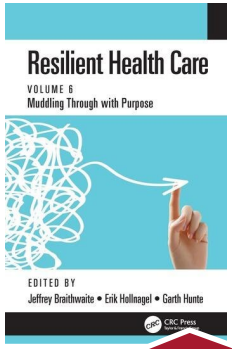
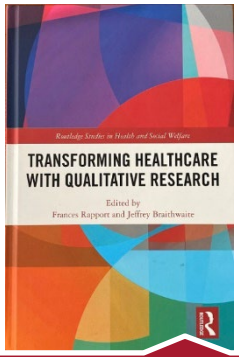


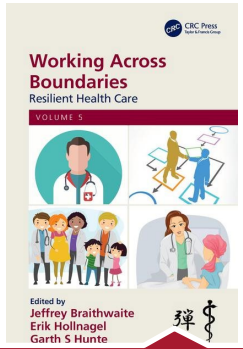
2022 – Transforming Healthcare with Qualitative Research



2021 – Muddling Through With Purpose



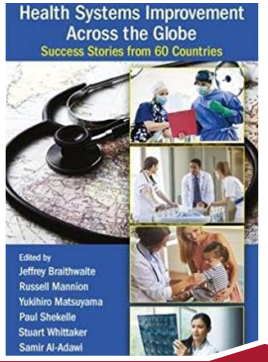
2020 – Transforming Healthcare with Qualitative Research



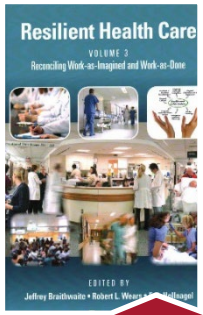
2019 – Working Across Boundaries

2018 – Delivering Resilient Health Care

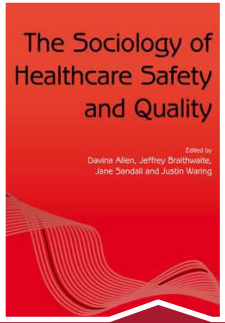
2018 – Healthcare Systems: Future Predictions for Global Care



2017 – Health Systems Improvement Across the Globe: Success Stories from 60 Countries

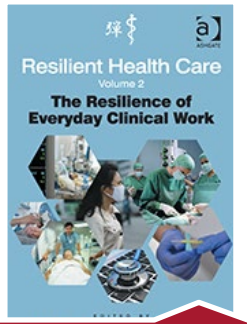


2017 – Reconciling Work-as-imagined and Work-as-done

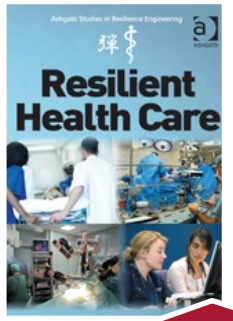


2016 – The Sociology of Healthcare Safety and Quality

2015 – Healthcare Reform, Quality and Safety: Perspectives, Participants, Partnerships and Prospects in 30 Countries



2015 – The Resilience of Everyday Clinical Work



2013 – Resilient Health Care

2010 – Culture and Climate in Health Care Organizations

Forthcoming books

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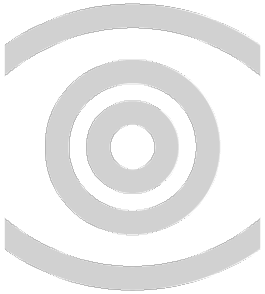
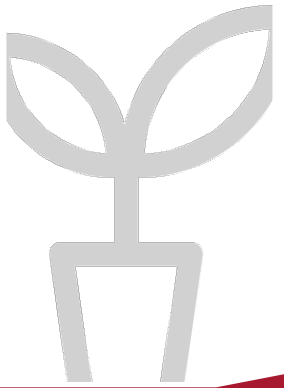
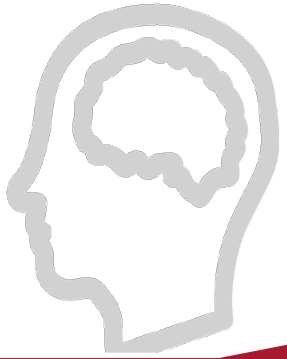


Gaps: the Surprising Truth Hiding in the In-between



Surviving the Anthropocene



Counterintuitivity: How your brain defies logic

Handbook on Climate Change and Health System Sustainability

Jeffrey Braithwaite PhD

FIML, FCHSM, FFPHRCP, FAcSS, Hon FRACMA, FAHMS

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Appendices: Additional ideas and frameworks