

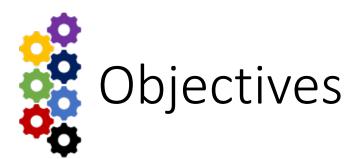
Systems Change & Systems Thinking in Public Health

Module 1b

A Short Course in Systems Approaches to Healthy Eating & Active Living
Using the I+PSE Conceptual Framework for Action

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At the end of this module, you will be able to:

- Connect complex and adaptive problems to the need for deeper and more systemic change.
- Describe the benefits of systems thinking in addressing complex adaptive problems, including problems involving inequity.
- Utilize systems thinking tools to facilitate systematic reflection on a complex problem and opportunities to address it.



Recommended Readings & Resources



- Foster-Fishman PG, Nowell B, Yang H. Putting the system back into systems change: a framework for understanding and changing organizational and community systems. *Am J Community Psychology*. 2007;39(3):197-215. doi:10.1007/s10464-007-9109-0
- Senge P, Hamilton H, Kania J. The dawn of system leadership.
 Stanford Social Innovation Review. 2015.
- Kalen Pilkington. It All Started in the Garden: A Systems
 Thinking Approach to Community-Based Urban Agriculture
 (11 minutes)
 - https://www.ted.com/talks/kalen pilkington it all started in the garden a systems thinking approach to community based urban agriculture



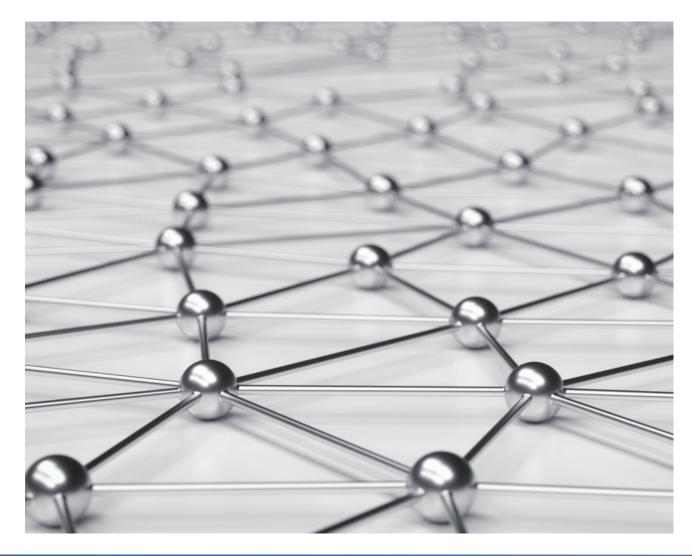
What Is A System?

A human construct constituted by the...

Elements, that is, all the parts that make up the whole

Links between the parts, that is, the processes and **interrelationships** that hold the parts together in view of the whole

Boundaries, that is, the limit that determines what is inside and outside a system.





Why Change Systems?

"...systems change refers to an intentional process designed to alter the status quo by shifting and realigning the form and function of a targeted system...

In most system change endeavors, the underlying structures and supporting mechanisms that operate within a system are altered, such as the policies, routines, relationships, resources, power structures, and values...are rooted in the assumption that significant improvements in the outcomes of a targeted population (e.g., reduced mental health problems in children) will not occur unless the surrounding system (e.g., service delivery system) adjusts to accommodate the desired goals."





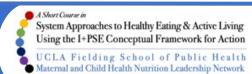
A Systems Approach to Title V MCH Services

Direct Services

- Assess and monitor health status
- 2) Investigate, diagnose, and address health problems and hazards
- Communicate effectively to inform and educate the public on health
- 4) Strengthen, support and mobilize community partners to improve health
- 5) Develop and implement supportive health policies, plans, and laws
- 6) Improve and protect the public's health through legal and regulatory actions
- 7) Assure effective and equitable health systems
- 8) Build and support a diverse and skilled public health work force
- 9) Improve and innovate public health functions through program evaluation, research and continuous quality improvement
- 10) Build and support a strong public health organizational infrastructure

Enabling Services

Public Health
Services & Systems



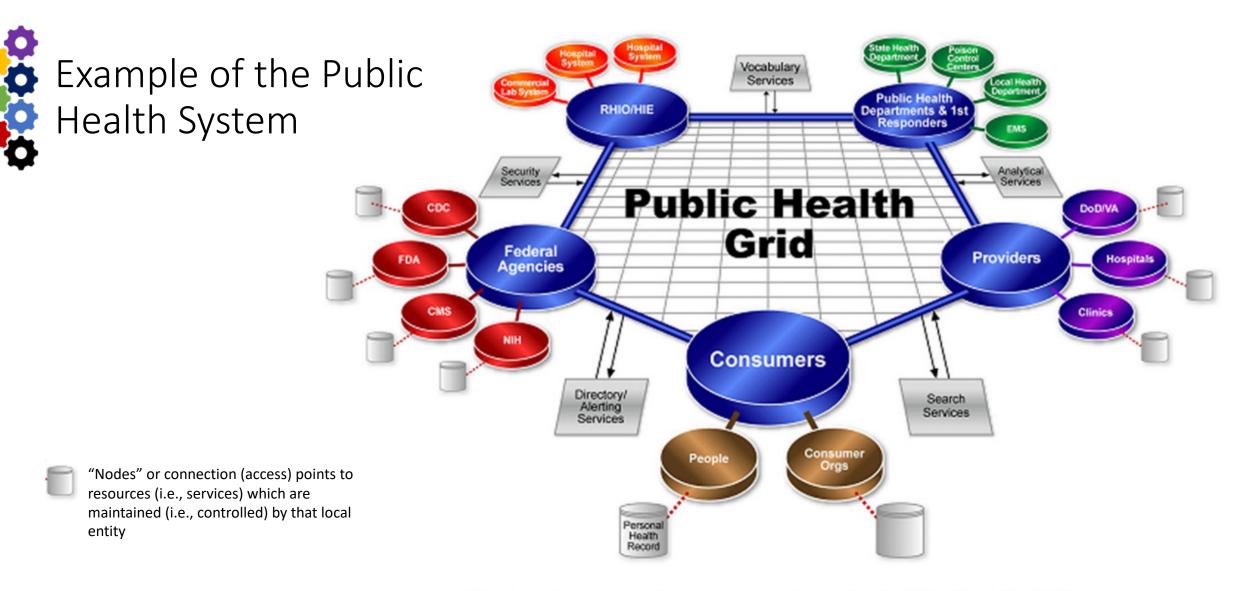
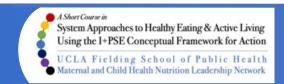
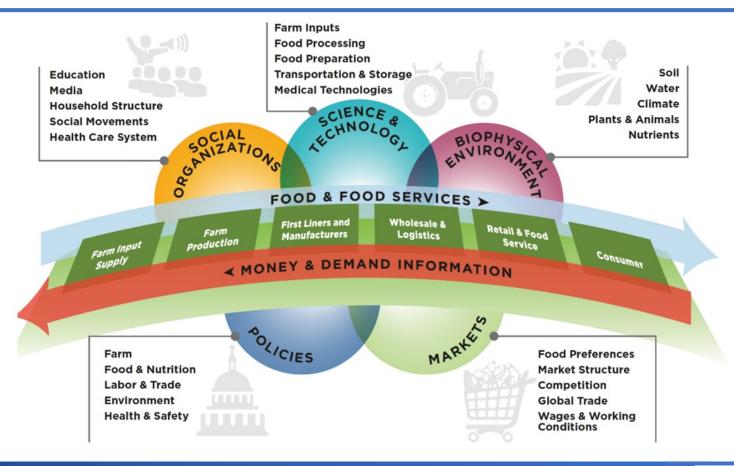


Fig. 1 - Conceptual representation of a Public Health Grid.





Example of the Food System



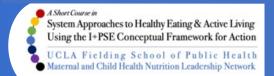


Policy, Systems, Environments = PSE

"This modern public health world that we are quickly moving into, one in which public health as the local governmental institution has a responsibility and an opportunity to lead our collective impact around improving the public's health. This is a multi-sectoral approach that takes the opportunity to address environmental, systems, and policy-level change."

Dr. Karen DeSalvo Former HHS Assistant Secretary for Health October 26, 2015





What are Policy, System, and Environment (PSE) Approaches?

Policy

Organizational & Community Policy – Changes to or the creation of procedures or organizational practices and the formation of interdisciplinary partnerships and collaborations

Public Policy - Changes to or creation of laws, ordinances, resolutions, mandates, regulations or rules

Systems

Infrastructure & Operations - Changes to infrastructure that impacts all elements of an organization, institution, or framework

*Result of individual, policy PLUS environmental changes

Environments

Built - Modifications to physical spaces and settings in organizations, institutions, or public areas

Natural – Changes to ecological resources, landscapes, and ecosystems that impact soil, water, air, energy, climate, and biodiversity

Social – Addresses societal dynamics, historical relationships, and cultural practices and their influence on power, equity, diversity, and inclusion

Charting a Course for Systems Change

We [nutrition community] must position ourselves for new and expanded practice roles to address policy-, systems-, and environmental-level interventions based on the social ecological model.

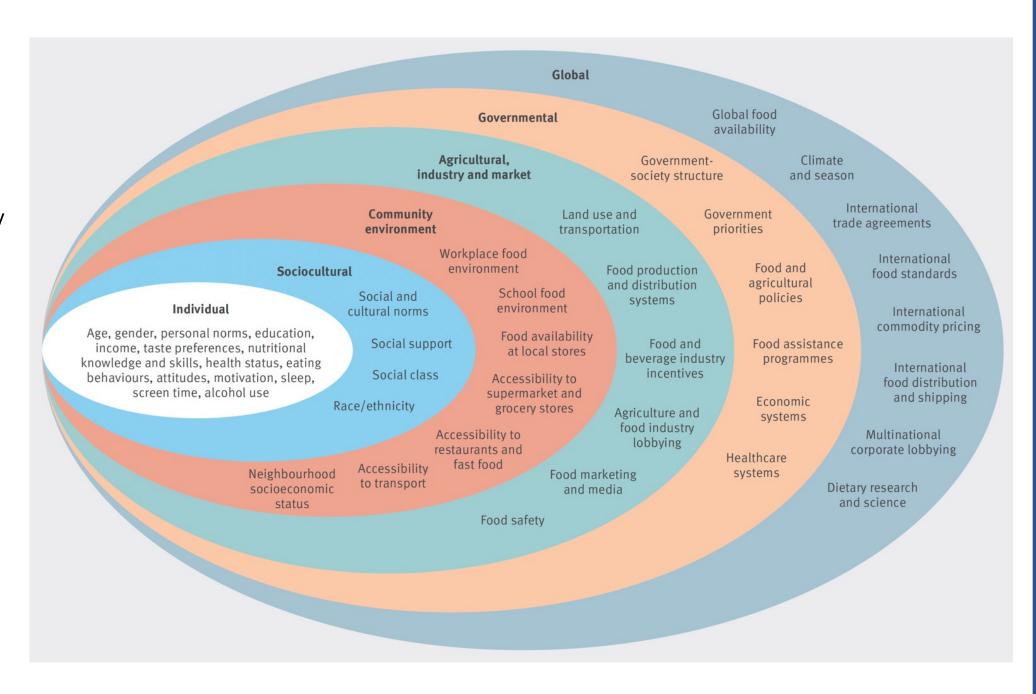
Kicklighter JR, et al. Visioning Report 2017: A preferred path forward for the nutrition and dietetics profession. *J Academy Nutr Diet*. 2017;117(1):110-127.



Example of a Social Ecological Model and Nutrition Policy

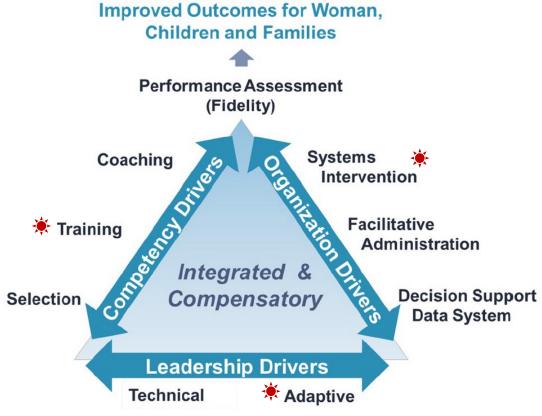
"Systems within systems"

Mozaffarian D, Angell SY, Lang T, Rivera JA. Role of government policy in nutrition—barriers to and opportunities for healthier eating. *BMJ* 2018; 361 :k2426





Systems Change & MCH



Implementation Drivers Framework

- Organization
 - Systems Intervention
- Leadership
 - Adaptive
- Competency
 - Training

See best practices at Fleming WO, Apostolico A, Mullenix A, Starr K, Margolis L. Putting implementation science into practice: Lessons from the creation of the National Maternal and Child Health Workforce Development Center. *Matern Child Health J.* 2019; 23:722-732. https://doi.org/10.1007/s10995-018-02697-x

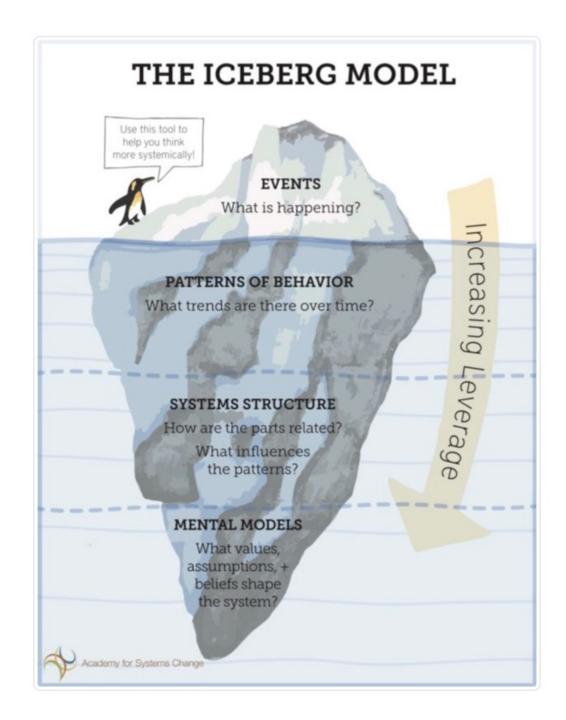
How Do We "Nudge" Systems to Change?

System change requires looking below the water to examine **trends** over time, the **interrelatedness** of the parts, the factors that influence the **patterns**, and the **values and beliefs** that shape the system.

Looking below the water helps identify leverage points in which a small shift in one thing can produce a big change.

The Iceberg Model. Academy for Systems Change. Accessed on September 10, 2021 at: https://www.academyforchange.org/2019/12/07/leverage-points-iceberg-model-economic-development/

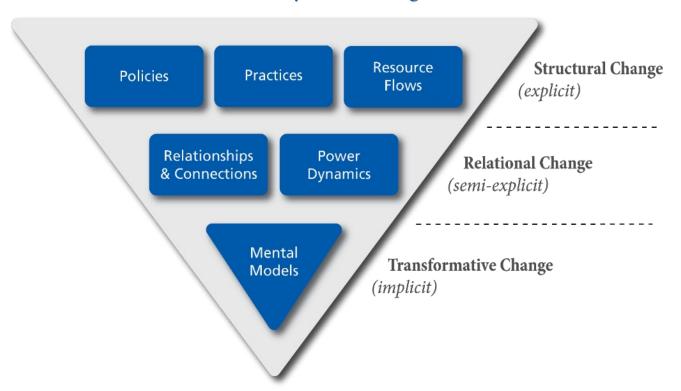
Donella H. Meadows, "Thinking in Systems. A Primer" (2008)



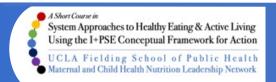


Building Capacity for Systems Change

Six Conditions of Systems Change



"Shifts in systems conditions are more likely to be sustained when working at all three levels of change."





Building Blocks for Systems Change

Individual Capacity

- Professional development
- Adaptive, agile, courageous
- Leadership

Organizational Capacity

- Adaptive, agile, resilient
- Action Learning

Systems Praxis

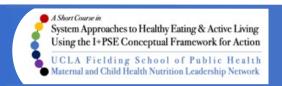
- Systems Science
- Systems Theory
- Systems Practice
- Systems Leadership



What is Systems Science?

"Systems science is an interdisciplinary field that is conceptually grounded in a concern with 'interrelationships between parts and their relationships to a functioning whole." (Frerichs et al 2016)

"Systems science is a broad class of analytical approaches that aim to uncover the **behaviour of complex systems**...As a whole, systems methodologies are thought to enable researchers and decision makers to examine system **components**, and the dynamic **relationships** between them, at multiple levels, from cell to society." (Carey et al 2015)





Where's the Evidence?

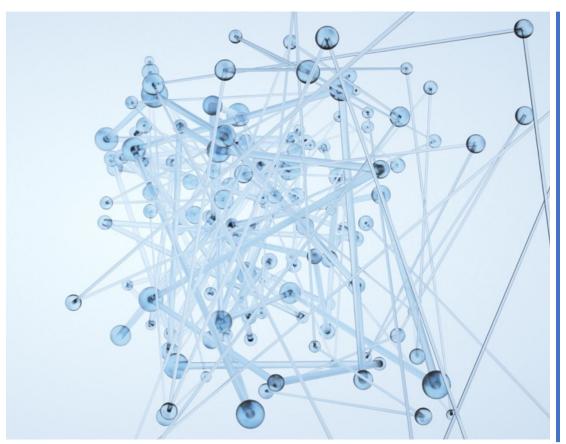
System Change Theories and Frameworks

- Community Organization Model
- Culture of Health Framework
- Diffusion of Innovation Theory
- General Systems Theory
- Life Course Theory
- Organizational Change Model
- PRECEDE-PROCEED Framework
- Social Determinants of Health
- Social-Ecological Model

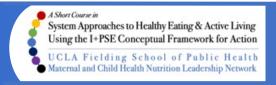




System Change Requires Systems Thinking



"Bringing systems thinking further into the current and future work of the public health practitioner requires an understanding of how systems thinking is being supported by a variety of systems methods."





What are the Principles of Systems Thinking?

- No consensus on a definition
- Ongoing and iterative inquiry of "why" and "how?"
- Identify the connections within and between systems
 - Interconnectivity
- Identify patterns and gaps to inform multidimensional solutions

- Understand an issue within the context of a larger whole
 - Boundaries
 - Acquire diverse perspectives
 - Check assumptions, biases, mental models
- Includes iteration and evolution
 - Cycles of action and reflection
 - Commitment to learning





Systems Thinking Facilitates Seeing...

Perspectives

- Raises ethical and power dynamics
- Assumptions that impact conceptualization, methods, and solutions
- Impacts engagement

Boundaries

- Scope
- Defining what and whose boundary

Interrelationships

- Interconnections between and among boundaries
- Circles of causality rather than linear perspectives
- Structures underlying dynamic complex situations (not a condition or behavioral elements)
- Alternate connections and opportunities, levers of change





Why Systems Thinking in Practice?

"Systems thinking is needed...to navigate and thrive in a volatile, uncertain, complex, and ambiguous (VUCA) world...to think in new ways, to be effective leaders...and continually seek opportunities to lead, learn, and grow."

Charting a Course

RDNs and NDTRs of the future are agile

They:

- ... Engage their collaborative networks to make decisions that have scientific foundations. even when research is still emerging.
- ... Develop capacity for ad-hoc teams and decentralized decision making so they are prepared to respond to a rapidly evolving environment. Dietitian leaders empower their teams to stay abreast of current research and hone their decisionmaking skills.
- . Are prepared to take advantage of software, taskification, and automation in order to devote more time to higher-order tasks that require critical thinking and responsive communication.

How can RDNs

Navigating volatility, uncertainty, complexity, and ambiguity is challenging, for both individuals and organizations. Thriving in a VUCA world requires RDNs and NDTRs to think in new ways; to be effective leaders and contributors within interprofessional teams; and to continually seek opportunities to lead, learn, and grow.

RDNs and NDTRs of the future are courageous

They:

- ... Share their expertise with confidence. They also recognize that the evidence base is rapidly evolving, and they continually pursue lifelong learning.
- ... Are willing to engage with and tolerate risk. They create learning environments where it is safe to share and learn from critical feedback.
- ... Seek out innovative partnerships, identifying opportunities to collaborate with both traditional allies and competitors.
- ... Are willing to serve in nontraditional leadership roles.

and NDTRs thrive in a VUCA world?

RDNs and NDTRs of the future are trusted

They:

- ... Sharpen their ability to uphold standards of evidence-based practice in an environment where the timeliness of decisions grows in importance.
- ... Expand their reputation as a trusted source in the ambiguous and psychologically fraught world of diet and health.
- ... Value and build diversity, inclusion, and representation in order to support diverse perspectives and communication mediums.

RDNs and NDTRs of the future are systems thinkers

- ... Hone specific skill sets, and also see broader connections between actions at the individual level and actions at the level of policy, systems, and environments.
- .. Shift emphasis from providing facts to driving change, thinking critically, and understanding complex systems.
- . Develop collaborative relationships with other professions, disciplines, and sectors. Diverse teams are better equipped to work at the systems level, be responsive to changing conditions, and think in new ways that don't rely on past patterns.



What is Systems Practice?

Systems-based practice relies on an understanding of real-world complex problems, how your practice relates to the problem and the larger system (e.g., clinic, public health, healthcare), how to identify levers to change the system, apply multiple methods that intervene in and positively improve the system, reflect on process, and monitor changes.

1

Explore the Complex Problem

- View it from five systemic perspectives
- Identify primary and secondary issues
- Connect practice to larger system

2

Check on Progress

- Evaluate the improvements achieved
- Reflect on the systems approaches used
- Discuss and agree on next steps

Produce Intervention Strategy

- Appreciate the variety of systems approaches
- Choose appropriate systems methodologies and models
- Structure, schedule, and set objectives for the intervention

Intervene Flexibility

- Stay alert to the evolving situation (revisit Stage 1)
- Stay flexible about appropriate methodologies, models, and methods (revisit Stage 2)

3





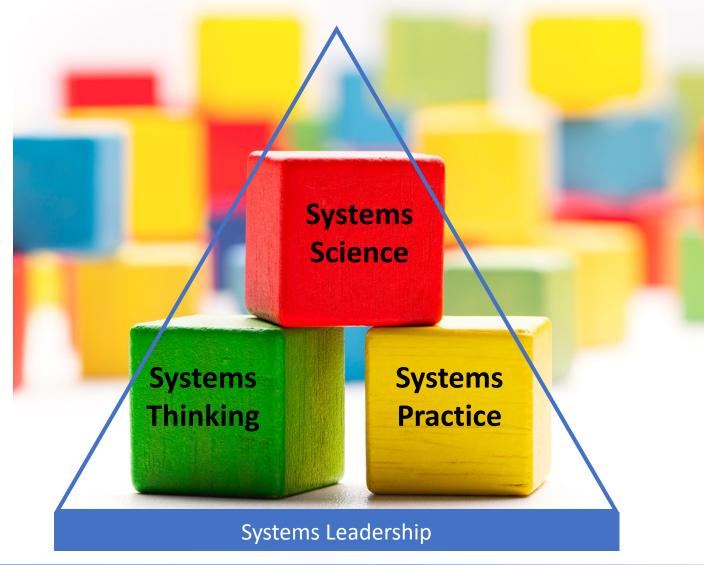
How Do We Facilitate Systems Leadership?

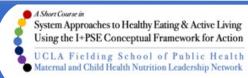
Increase our ability to define systems, adaptive challenges below the water

Increase learning capacity to ask questions and dig deeper to find meaning

Increase resiliency among leaders and teams who learn over time

Design and address adaptive complex problems more effectively and with less effort







Tools for Making Sense of Systems

How to Think Systemically and Identify Levers for Change



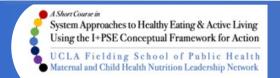
"Balcony and the dance floor"

Perspectives

- SWOT or SOAR Assessments
- Interviews
- Environmental scan
- Asking assumptions

Visual Depictions & Mapping

- "5 Whys"
- Rich Picture
- Fishbone/Ishikawa Model
- Causal Loop Diagram
- Social Network Analysis





Example of the "5 Whys?"

Problem-solving tool

Identify the root causes of a complex problem, not just the symptoms

Identifies the evidence

Addresses assumptions

Contributes to quality improvement

Complex Problem MCH/WIC staff feeling frustrated with pace of clinic

Why?

Declining appointment rates, increase "no shows"

Why?

MCH and WIC clients unable to access the clinic

Why?

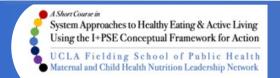
• Public transportation no longer available near the WIC/MCH clinic

Why?

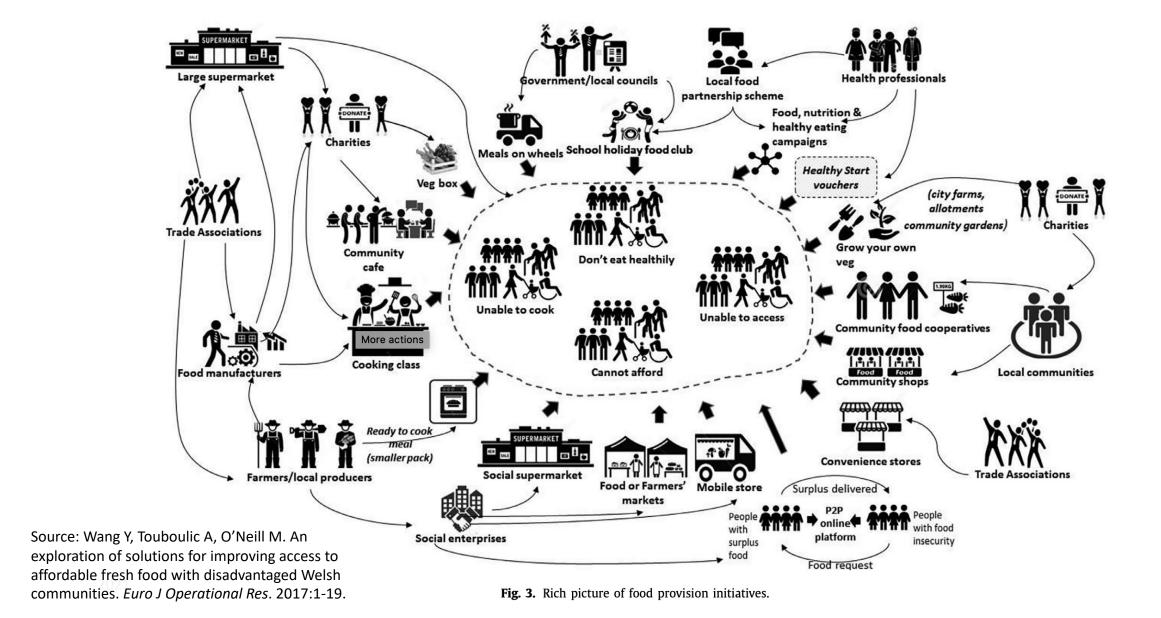
• Some streets are closed due to construction and replacing water and sewage pipes, buses are re-routed

Why?

 New residential and commercial expansions in the area require upgrades to utilities



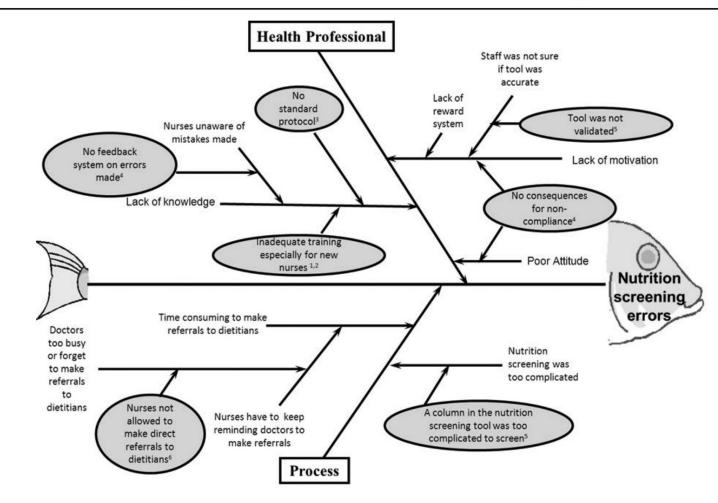
Example of a Rich Picture of Community Food Access



Example of a Fishbone Model (Ishikawa Model) to Identify Causal Factors or Root Causes

Lin Lim S, et al. Improving performance of nutrition screening through a series of quality improvement initiatives. *Joint Commission J Qual Patient Safety*. 2014;40(4):178-186.

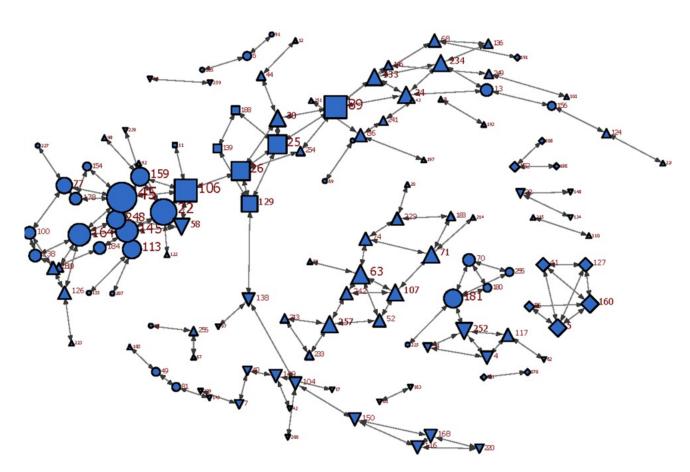
Root Causes Identified in Fishbone Diagram to Improve the Performance of Nutrition Screening



- 1-4 Root causes were determined after the audit in 2009.
- 5-6 Root causes were determined after the audit in 2010.
- 1–6 These root causes led to the interventions listed in Table 1 (page 183).

Figure 1. The root causes for nutrition screening errors were determined in a brainstorming session in which this fishbone diagram was used. The root cause analysis was used to identify five key gaps: (1) inadequate training for nurses, (2) no standard screening protocol, (3) no feedback system on errors, (4) a complicated screening tool and (5) nurses' inability to make direct referral to dietitians.

Example of a Social Network Analysis



A social network analysis offers a visual depiction of "who is at the table."

It includes methods to assemble and analyze the **relationships** among actors such as people, programs, departments, organizations, and countries.

It illuminates patterns of connections and relationships which may influence how individual, organizations, or communities respond to new information.

Yousefi-Nooraie, R., Dobbins, M., Brouwers, M. et al. Information seeking for making evidence-informed decisions: a social network analysis on the staff of a public health department in Canada. *BMC Health Serv Res.* 2012;12(118). https://doi.org/10.1186/1472-6963-12-118 2021; Luke DA, Stamatakis KA. Systems science methods in public health: Dynamics, networks, and agents. Annual Review of Public Health. 2012;33:357-376.



Leadership Element



Systems thinking is an extension of our training in science, theories, methods, and tools to better see and understand various perspectives, identify the **boundaries** or scope of complex issues, and to identify the interrelationships and levers for change to effectively address complex adaptive problems.



Key Take Aways

- Connect the work you do to the system in which you work
- ✓ When faced with a complex problem, ask "Why?" five times to develop a deeper understanding
- ✓ To apply systems thinking in practice, use visuals to map relationships or identify factors that influence the complex problem
- Use systematic reflection to identify opportunities to leverage change that will have a positive impact on the system

