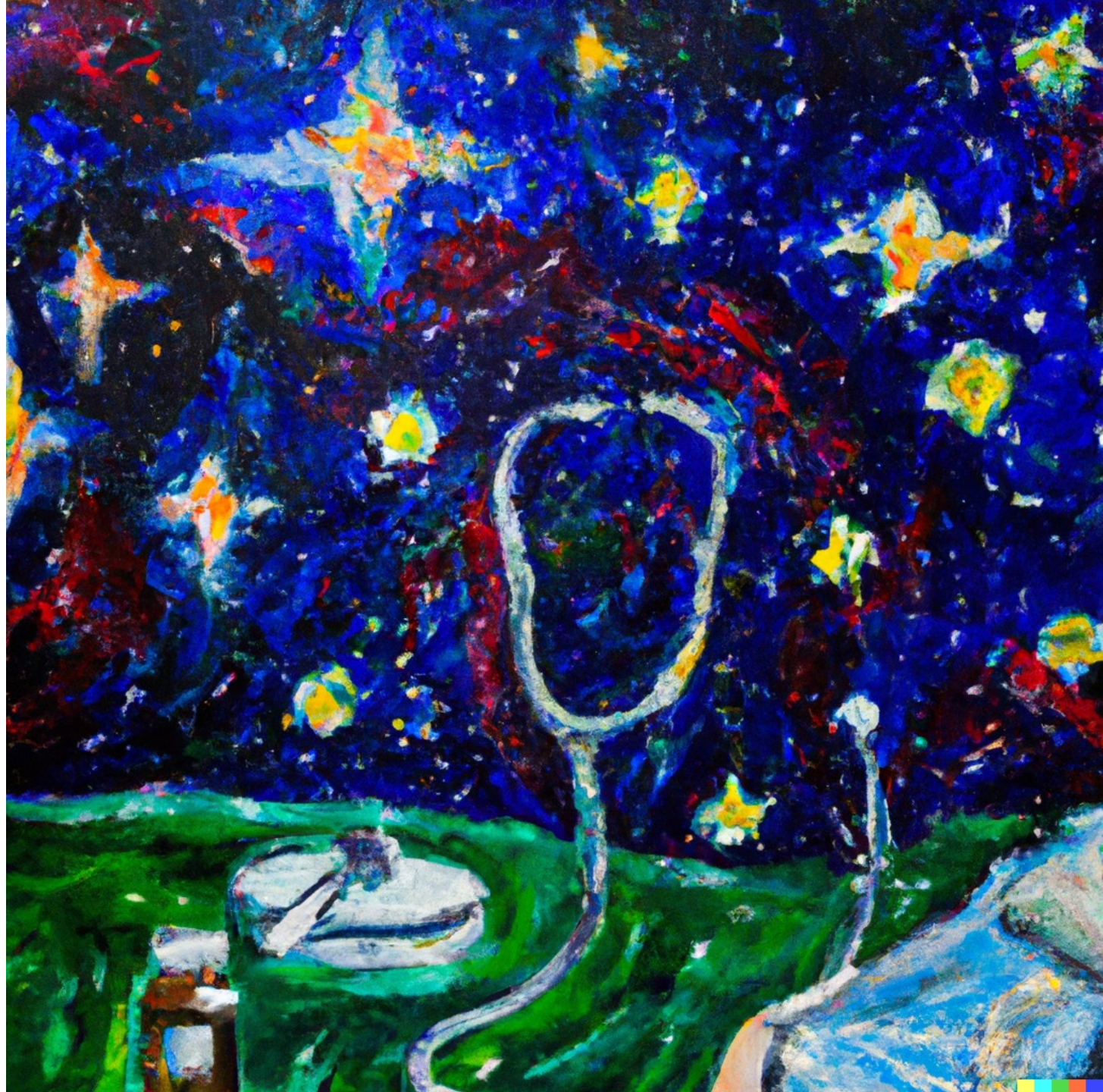# Health Systems Sciences and Future Health Care Practices post COVID-19

5 February 2024

Somsak Chunharas

President

National Health Foundation

Outline

- From "system-based education to Health systems science framework
- Why Health systems sciences?
- What does success (should) look like?
- How to make it happen?
  - Kern's 6-step approach to integrate health systems science curricula into medical education
- Practice: Innovative approach in implementing health systems science
  - Undergraduate level
  - Graduate level
- Personal reflections

Health Systems Science Framework (2017)

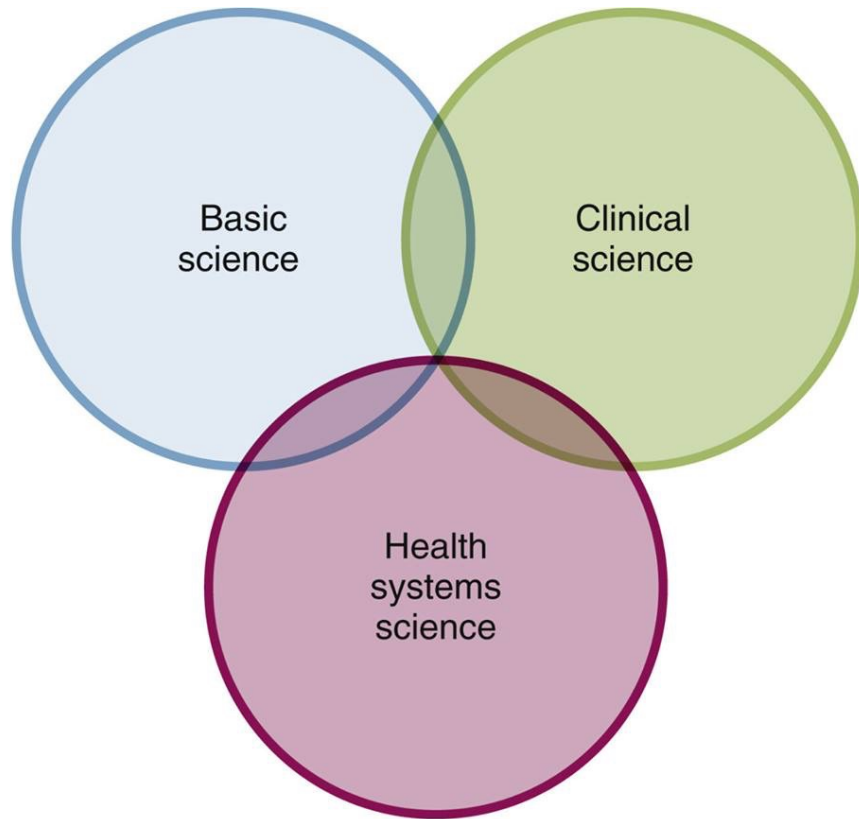แผนภาพแสดงให้เห็นการซ้อนทับกันระหว่าง pillar

ในบริบทประเทศไทย บาง "องค์ประกอบ" มีการเรียนการสอนมาก่อนปี 2017 บางองค์ประกอบยังขาดหาย

Fig. 1.4 The three-pillar model of medical education.
Health Systems Science—the "third science"—complements and synergizes with basic and clinical science, and addresses subject areas including value-based care, teamwork, and health system improvement.

Source: Skochelak et al. (2017);
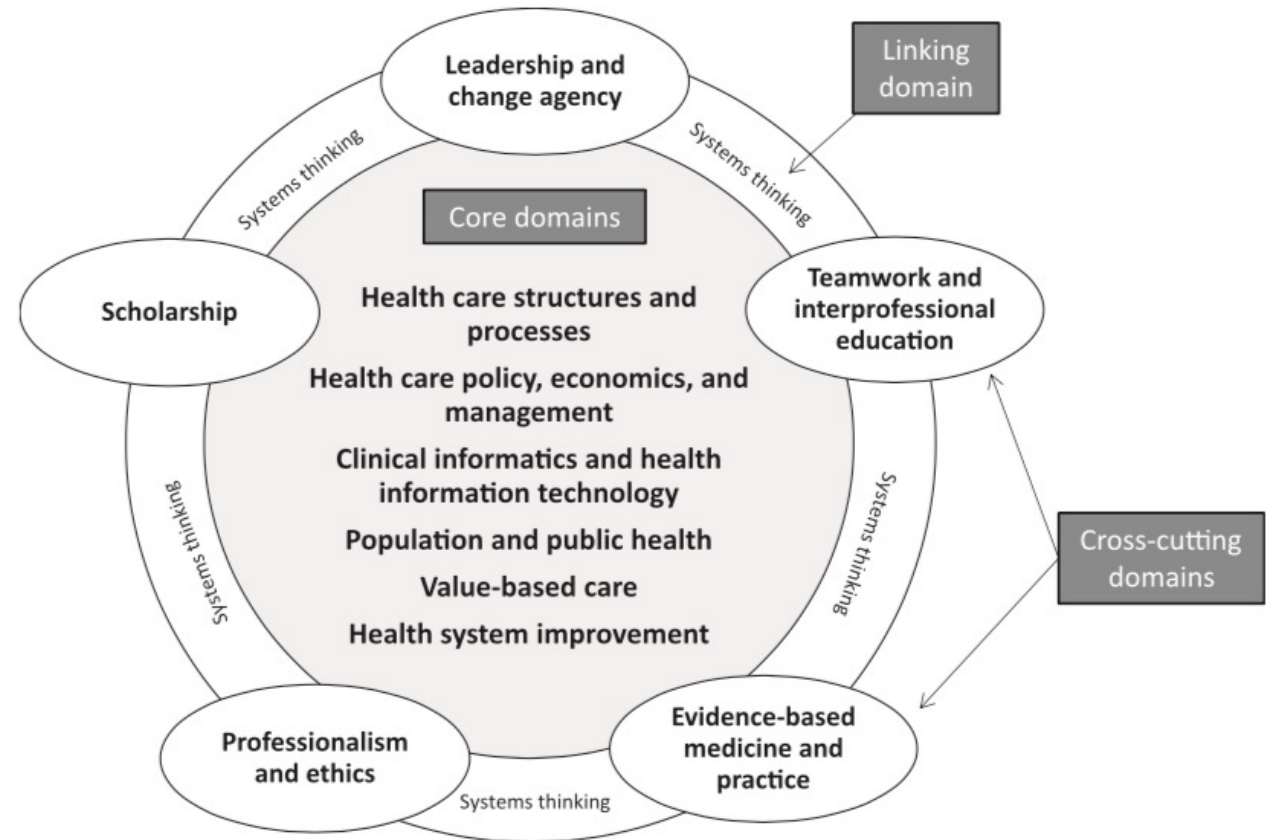
Source: Gonzalo JD, Dekhtyar M, Starr SR, Borkan J, Brunett P, Fancher T, et al. Health Systems Science Curricula in Undergraduate Medical Education: Identifying and Defining a Potential Curricular Framework. Acad Med. Academic Medicine; 2017;92:123–31.

Health Systems Science Framework (2020)
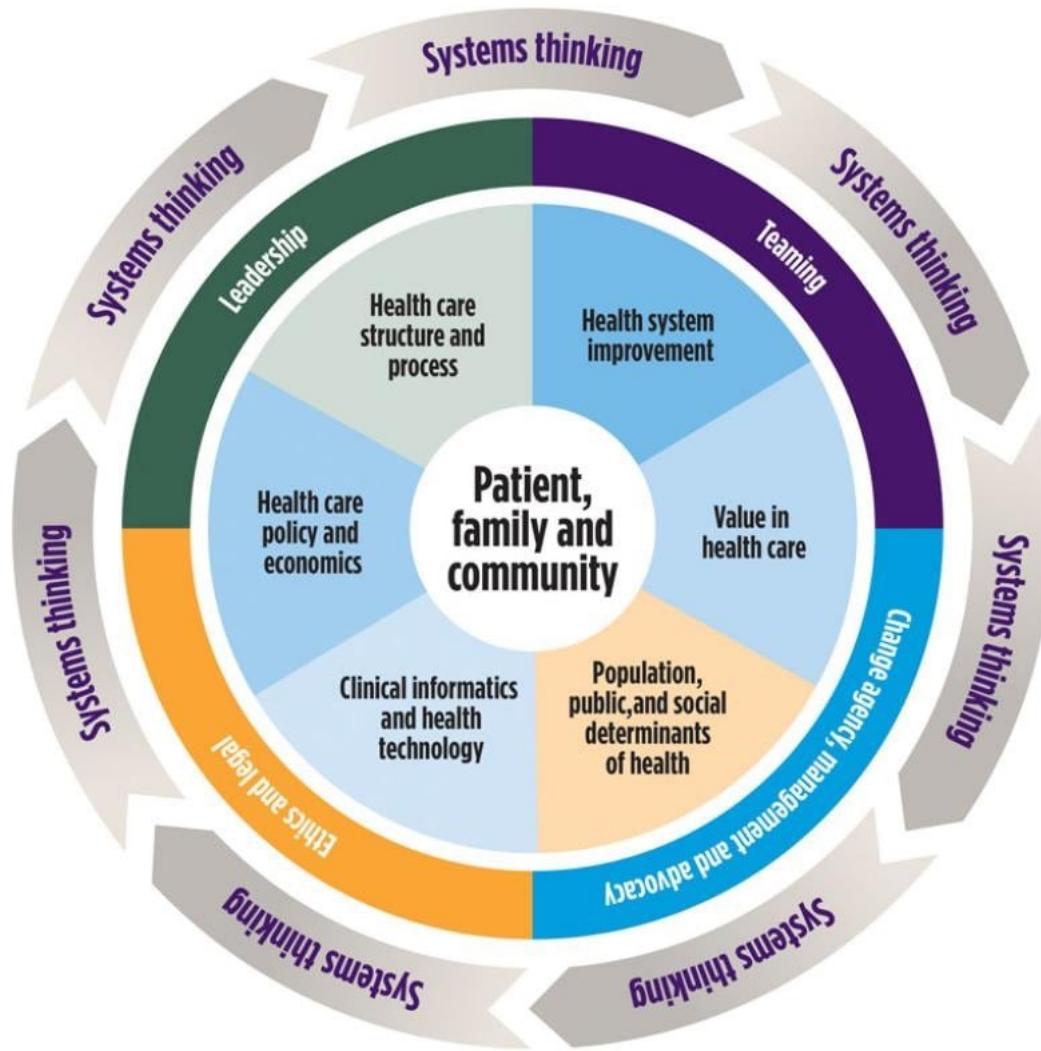
Systems Concepts and Knowledge

Systems Skills

Systems Thinking

Health Systems Science Framework (2020)

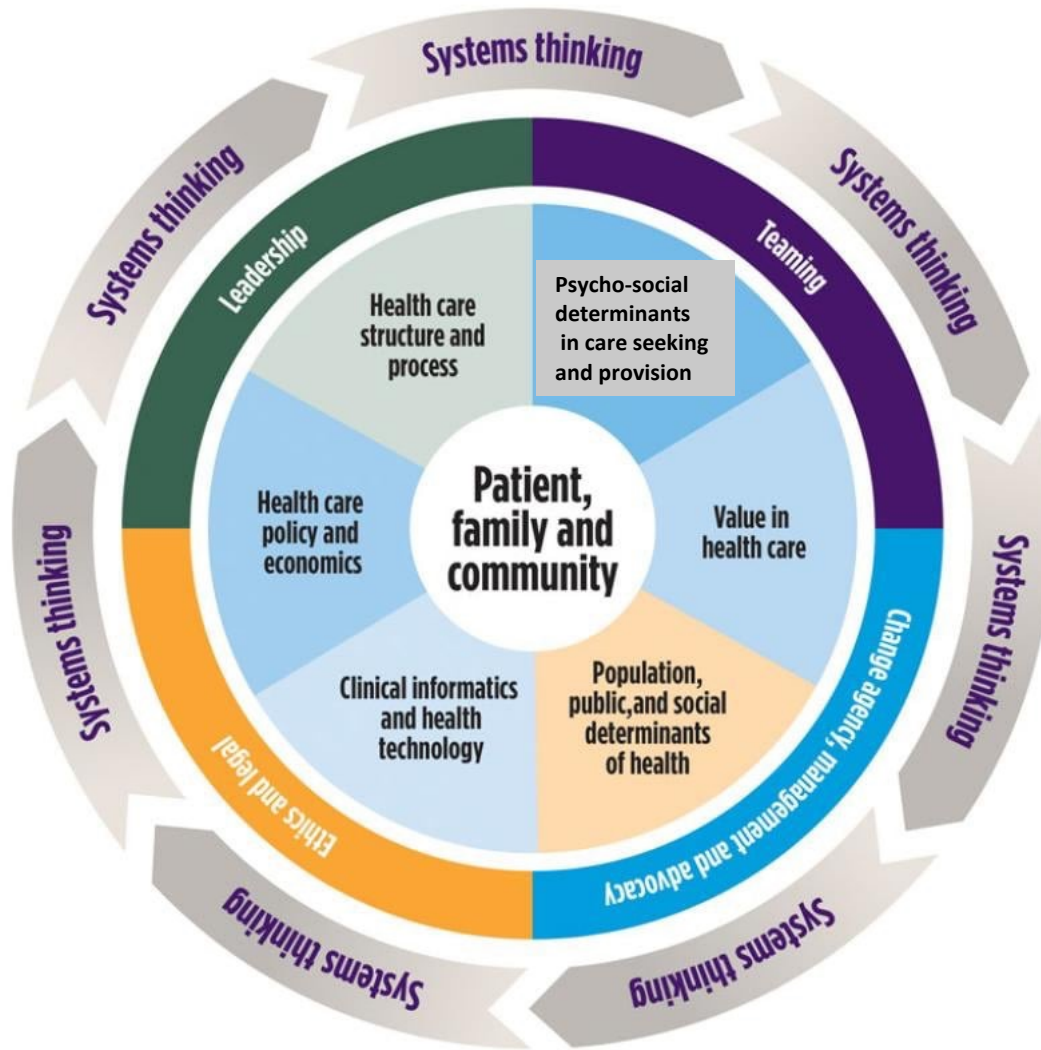Details of the innermost circle reflects why and what do you expect from students/doctors learning HSS

Why Health Systems Sciences (HSS)

Essential to being a good and happy doctor or only for those interested in health policy and management?

The Interdependence between Education and Health System

What do we see as relationship/interdependence between health systems and education of health professionals?
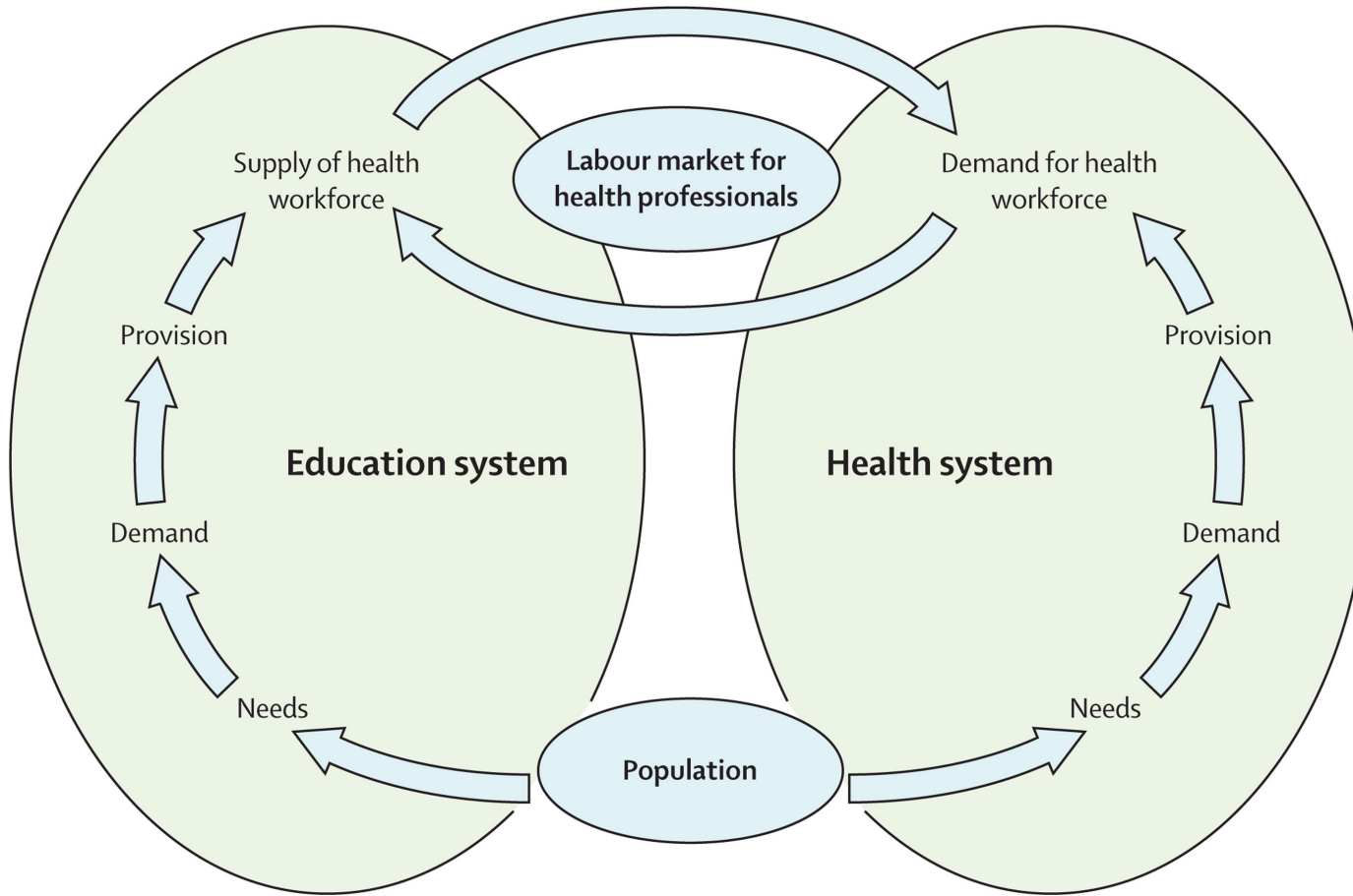
Education makes graduates system neutral (regardless of systems context)

Education needs to produce graduates who fit with existing health system (understand design, structures and policies)

Education makes graduates system sensitive/conscious and knowledgable (cognizant) of systems (regardless of systems context)

Source: Frenk J, Chen L, Bhutta ZA, Cohen J, Crisp N, Evans T, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. The Lancet. 2010 Dec 4;376(9756):1923–58.

Not to specifically make medical graduates health systems reformer/policy makers/managers

Same as "community medicine" not meant to make graduates "good primary health care providers"

But to make medical graduates **more capable in taking care of patients' needs and addressing systems barriers**

The least is to understand and be able to tackle issues relation to the 6 innermost

Better is to develop certain concepts and skills in the middle circle

Best is to have systems thinking and be dynamic and flexible in tackle systems dimension

What does success look like?

What are some "differences" expected from graduates who are systems cognizant?

Theory: students with health systems science become 'what'
Professional identity of graduates with HSS competency

"Finding My Piece in That Puzzle": A Qualitative Study Exploring How Medical Students at Four U.S. Schools Envision Their Future Professional Identity in Relation to Health Systems

Leep Hunderfund, Andrea N. MD, MHPE[1]; Kumbamu, Ashok PhD[2]; O'Brien, Bridget C. PhD[3]; Starr, Stephanie R. MD[4]; Dekhtyar, Michael MEd[5]; Gonzalo, Jed D. MD[6]; Rennke, Stephanie MD[7]; Ridinger, Heather MD, MHPE[8]; Chang, Anna MD[9]

Author Information ⊙

BUY   SDC   Metrics

Abstract

Purpose

Health systems science (HSS) curricula equip future physicians to improve patient, population, and health systems outcomes (i.e., to become "systems citizens"), but the degree to which medical students internalize this conception of the physician role remains unclear. This study aimed to explore how students envision their future professional identity in relation to the system and identify experiences relevant to this aspect of identity formation.

- These roles were categorized as **"bottom-up"** efforts enacted at a patient or community level (humanist, connector, steward) or **"top-down"** efforts enacted at a system or policy level (system improver, system scholar, policy advocate).
- Students described activities such as attending to **social determinants of health, serving medically underserved populations, connecting patients with team members to address systems-related barriers, stewarding healthcare resources, conducting quality improvement projects, researching/teaching systems topics**, and **advocating for policy change.**

Source: Andrea, N., Leep, Hunderfund., Ashok, Kumbamu., Bridget, C., O'Brien., Stephanie, R., Starr., Michael, Dekhtyar., Jed, D., Gonzalo., Stephanie, Rennke., Heather, Ridinger., Anna, Chang. "Finding My Piece in That Puzzle": A Qualitative Study Exploring How Medical Students at Four U.S. Schools Envision Their Future Professional Identity in Relation to Health Systems. (2022).;97:1804-1815. doi: 10.1097/ACM.0000000000004799

Future doctor (with balance in 3 sciences)

- Paying attention to patients' experiences and expectation
- A better listener with attention to both diseases and sufferings
- Better equipped with knowledge and ability to identify "systems factors" affecting both patients' sufferings/expectation and own practices/actions.
- Incorporating "systems remedies" as well as "treatment plan"
- Be able to "mobilize actions" from various parts of the systems starting from multi-professional teams to other groups of actors (family, community, concerned authorities, etc)
- Some might become a more capable doctors working at "community level" or an analyst/advocates for "better health systems"

A good doctor is too valuable to be only a "highly specialized" analyst and "drug/technologies prescribing" individual

Diseases are more and more complex (chronic, co-morbid with). Well-being and expectation of patients and families become more crucial than "technically determined" patients' outcomes (value matters!). A technically focused doctor will become more and more insignificant.

COVID-19 as a "warning sign" for need of "future doctor" who are more "systems cognizant and capable"

Not only for more effective pandemic control but to imagine/design possible new health care systems for the future.

Doctors and health systems in the fight against COVID-19

- NPI is very important even after vaccine is available
- NPI = systems interventions aiming at population health (pandemic control with least possible lives loss while maintain livelihood)
- Specialists of all fields need to "care for COVID patients" despite not being experts in infectious diseases nor pulmonologists.
- What happened outside of hospitals affect the way hospitals and doctors' functions – what can doctor do to "share their views" or "influence decisions and actions"
- Many things need doctors to work beyond hospital wards and walls and they need to be in sync

Doctors and health systems in the fight against COVID-19

- Understanding and being able to communicate and command trust of the public is crucial both for NPI and PI (drugs and vaccines)

- People may not need or want to come to hospitals or be admitted too frequently if there are alternatives for them.

- New technologies and new way of working enable new model of care that can be extended to have more seamless collaborative care and health services (tele consultations, telepharmacy. Inter professional and interlevel collaborative care are crucial)

- A relatively well structured and coordinated health care systems made collaboration much easier

COVID-19 reflects the need for new competencies, new educational emphasis and experiences and new health care systems design

Controlling COVID-19 demonstrated that new systems and model of care are possible and possibly more desirable. It needs doctors (and health professionals) who are "system cognizant and capable"

How and where to start?

Depends on what u want to "change/add" in view of the "desirable doctors" in your context

Theory: David Kern's 6-step approach

Theory: Using Kern's 6-step approach to integrate health systems science curricula into medical education

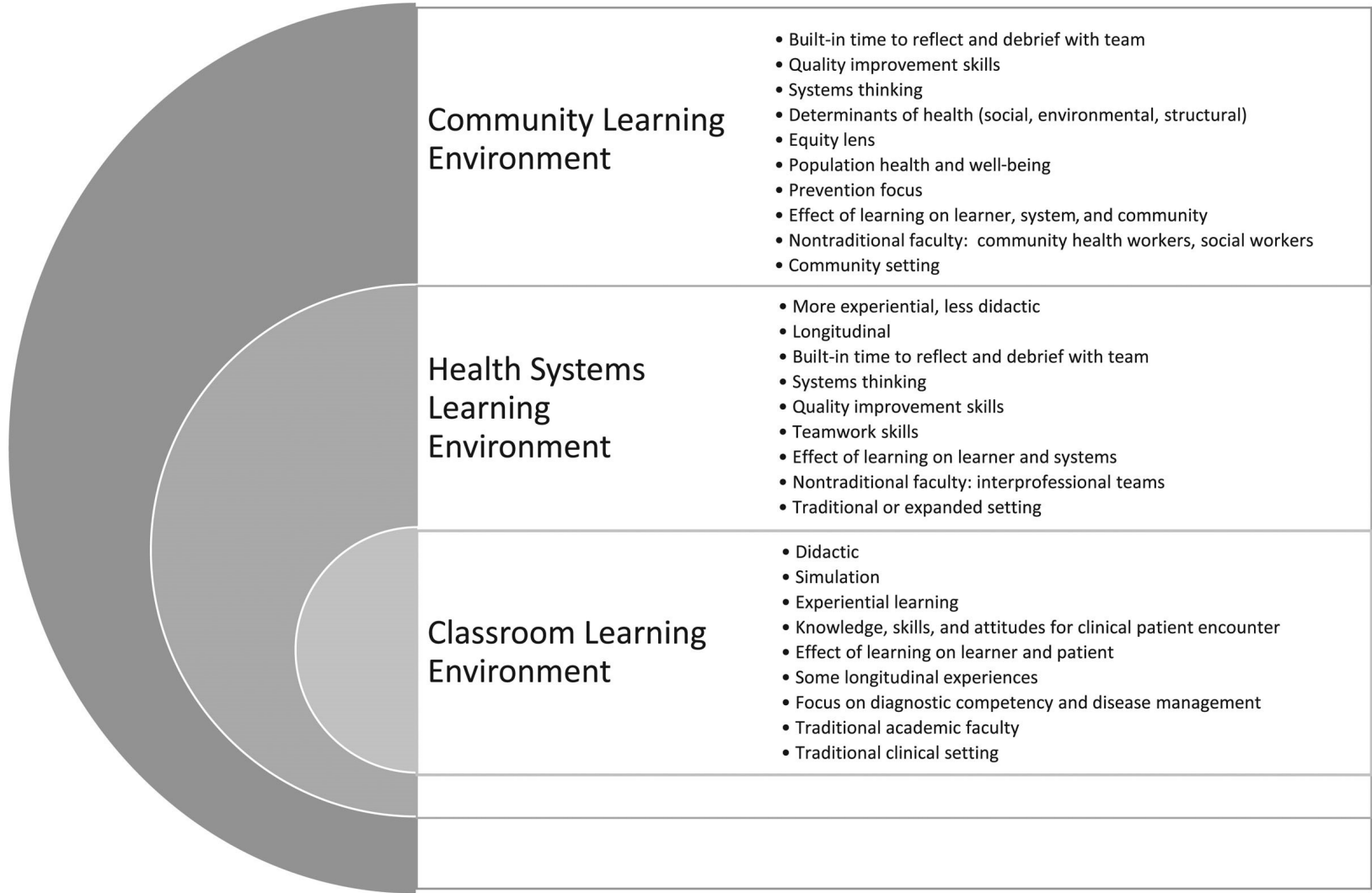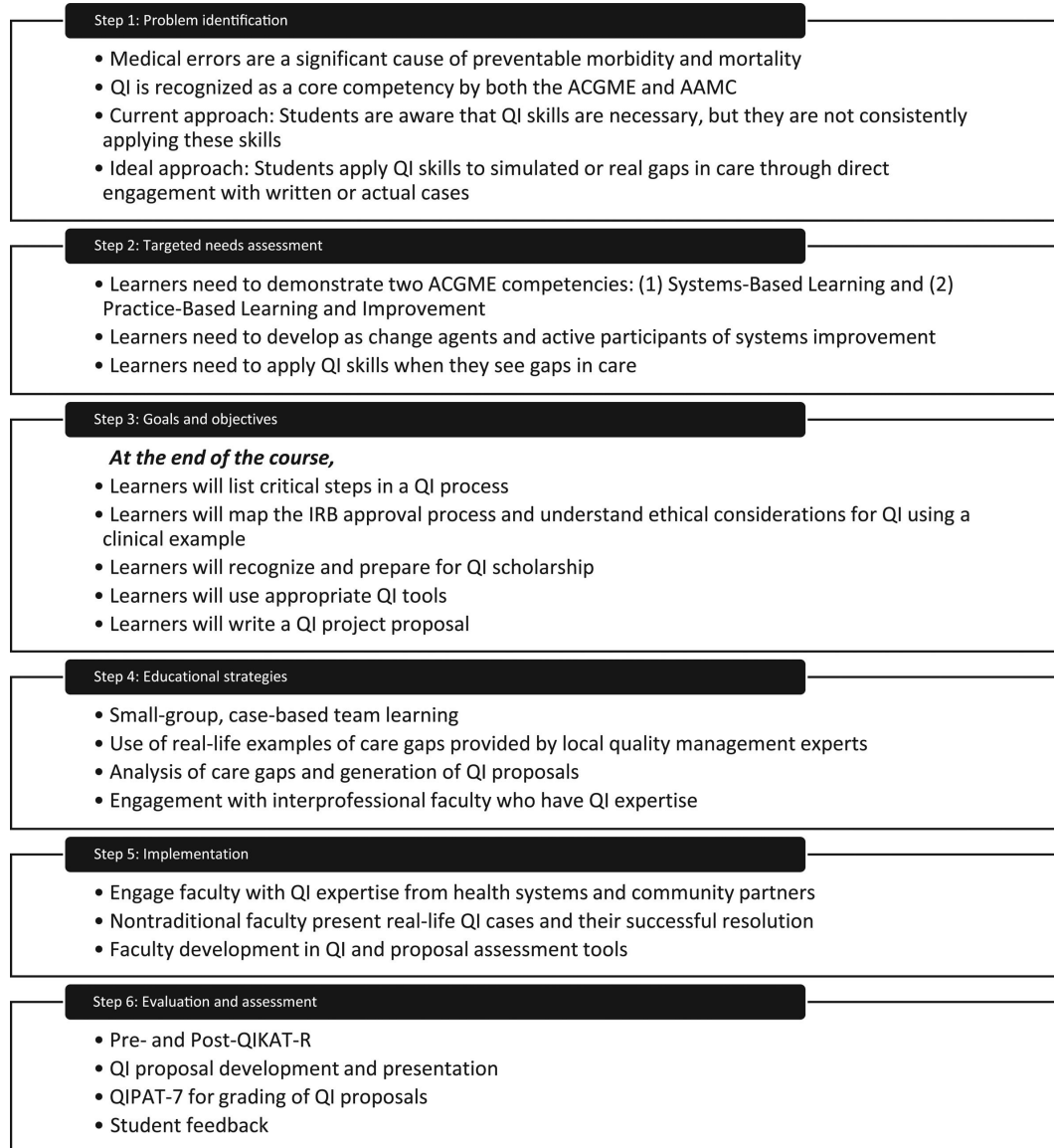|	
Community Learning Environment	• Built-in time to reflect and debrief with team • Quality improvement skills • Systems thinking • Determinants of health (social, environmental, structural) • Equity lens • Population health and well-being • Prevention focus • Effect of learning on learner, system, and community • Nontraditional faculty: community health workers, social workers • Community setting
Health Systems Learning Environment	• More experiential, less didactic • Longitudinal • Built-in time to reflect and debrief with team • Systems thinking • Quality improvement skills • Teamwork skills • Effect of learning on learner and systems • Nontraditional faculty: interprofessional teams • Traditional or expanded setting
Classroom Learning Environment	• Didactic • Simulation • Experiential learning • Knowledge, skills, and attitudes for clinical patient encounter • Effect of learning on learner and patient • Some longitudinal experiences • Focus on diagnostic competency and disease management • Traditional academic faculty • Traditional clinical setting

Elaborated educational framework. **The figure details unique educational opportunities provided by various learning environments for a health systems science curriculum.**

How is it like in your country context? What do we expect students to learn from these different settings, classrooms, health services systems, community? Do they mean the same in different country context?

Theory: Using Kern's 6-step approach to integrate health systems science curricula into medical education

Step 1: Problem identification

- Medical errors are a significant cause of preventable morbidity and mortality
- QI is recognized as a core competency by both the ACGME and AAMC
- Current approach: Students are aware that QI skills are necessary, but they are not consistently applying these skills
- Ideal approach: Students apply QI skills to simulated or real gaps in care through direct engagement with written or actual cases

Step 2: Targeted needs assessment

- Learners need to demonstrate two ACGME competencies: (1) Systems-Based Learning and (2) Practice-Based Learning and Improvement
- Learners need to develop as change agents and active participants of systems improvement
- Learners need to apply QI skills when they see gaps in care

Step 3: Goals and objectives

At the end of the course,
- Learners will list critical steps in a QI process
- Learners will map the IRB approval process and understand ethical considerations for QI using a clinical example
- Learners will recognize and prepare for QI scholarship
- Learners will use appropriate QI tools
- Learners will write a QI project proposal

Step 4: Educational strategies

- Small-group, case-based team learning
- Use of real-life examples of care gaps provided by local quality management experts
- Analysis of care gaps and generation of QI proposals
- Engagement with interprofessional faculty who have QI expertise

Step 5: Implementation

- Engage faculty with QI expertise from health systems and community partners
- Nontraditional faculty present real-life QI cases and their successful resolution
- Faculty development in QI and proposal assessment tools

Step 6: Evaluation and assessment

- Pre- and Post-QIKAT-R
- QI proposal development and presentation
- QIPAT-7 for grading of QI proposals
- Student feedback

Kern's 6-step approach to curriculum development 21 applied to a module for teaching **quality improvement (QI)**, which is related to health care delivery, an element of health systems science (HSS).

How many and what "problems" should be used to "teach and learn" about HSS?

Theory: Using Kern's 6-step approach to integrate health systems science curricula into medical education

Step 1: Problem identification
- Structural determinants of health result in significant differences in health outcomes across populations and communities in the United States
- To provide high-quality care, health professionals need to understand context of care, systems, and population and community health
- To provide learning that answers the big-picture question, "What contributes to health and disease patterns?"
- Current approach: Medical school curricula start with a pathophysiology focus, leaving students unable to connect disease processes with health disparities and inequities
- Ideal approach: Students recognize all determinants of health, including social, environmental, systemic, and structural; curriculum includes population and public health and their role in achieving health equity; students learn to be change agents who engage community partners to appreciate context of health and disease and address disparities and inequities; students are introduced to health care delivery systems

Step 2: Targeted needs assessment
- Explore and respond to student and faculty recognition of local health disparities
- Leverage a new partnership with the local health department (Cuyahoga County Board of Health [CCBH])
- Assess students' lived experiences and how they may affect attitudes toward learning this content
- Assess students' ability to recognize the health impact of "zip code vs genetic code"
- Retrieve actual population health data on the impact of social determinants of health (e.g., redlining, poverty, life expectancy, infant mortality), available through local partnership with CCBH

Step 3: Goals and objectives

At completion of the Block One curriculum,
- Learners describe one way the population health/health equity curriculum has changed the way they think about living in poverty and two ways that poverty affects the health of individuals and communities
- Learners discuss one way the curriculum has helped them learn how systems and communication affect the health of community members
- Learners describe something a student from another profession understood that was new to them

Step 4: Educational strategies
- Didactics
- Facilitated small-group, case-based discussions (problem-based learning), especially on structural racism and the physician's role in promoting health equity
- Team-based learning on the topics of population health, health systems, and climate change
- Community field experiences with discussion and structured reflection assignments on clinicians' implicit biases, structural determinants of health, and their contributions to health inequities
- Poverty and pandemic influenza simulation exercises

Step 5: Implementation
- Interprofessional 3-hour poverty simulation exercise (students live with limited resources)
- Community members serve as faculty
- Discussions about structural racism and health inequities
- Integration of basic science (epidemiology and biostatistics) as well as bioethics faculty and content

Step 6: Evaluation and assessment
- NBME Health Systems Science subject exam
- Weekly feedback from student small-group facilitators
- Field experience reflections, plus self-reflection and reconciliation based on weekly short essay questions
- Summative short essay exam that integrates material from across the course

How and where to start?

Context matters

Korea and the AMA HSS

Introduction of America's Health Systems Science Education and Its Criticism

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Abstract   Go to : ▾

Recently, Korean medical education circles have proposed a fullscale introduction of America's health systems science to replace the existing medical humanities education in Korea. The so-called Flexner education system, formed in the early 20th century, was centered on basic and clinical sciences. America's health systems science education was introduced to supplement the system. The full-scale introduction of health systems science has been promoted, mainly by the Korean Association of Medical Colleges. However, it does not fit into the current circumstance of Korean medical education circles. It is deemed that there are political reasons behind the push – the alignment of interests between the medical education circles and the government.

This study first examined the social and cultural circumstances behind the emergence of health systems science in America, focusing on pragmatism, a native American ideology, to critique the background of the introduction of the American system. It also discussed the negative aspects of pragmatism in American medical education in the cases of American educators Ralph Tyler and Abraham Flexner. Then, it specifically examined the background and reasons for introducing America's health systems science to Korea and discussed the problems of directly introducing the health systems science to Korea without any adaptation process through a comparative analysis with existing medical humanities. Finally, it suggested a more desirable adaptation form of health systems science that can be considered for its implementation in Korea.

색인어: 의료시스템과학, 인문사회의학, 의학교육, 프래그머티즘, 랠프 타일러, 에이브러햄 플렉스너

Keywords: Health Systems Science, Medical Humanities and Social Science, Medical Education, Pragmatism, Ralph Tyler, Abraham Flexner

- The full-scale introduction of health systems science in Korea has been promoted by the Korean Association of Medical Colleges, but it is not considered suitable for the current circumstances of Korean medical education.
- The study examines the social and cultural circumstances behind the emergence of health systems science in America, particularly focusing on pragmatism as a native American ideology. It also discusses the negative aspects of pragmatism in American medical education. The author also further explores the background and reasons for introducing America's health systems science to Korea and discusses the problems of directly introducing it without an adaptation process, comparing it with existing medical humanities.

How different is HSS teaching and learning be different from existing concepts and efforts in your country? => community medicine, preventive medicine, holistic health, etc

Innovative approach in implementing health systems science:
First year students as patient navigators

Early Medical Students' Experiences as System Navigators: Results of a Qualitative Study

Kelli Qua, PhD[1], Heidi Gullett, MD, MPH[1], Amy Wilson-Delfosse, PhD[1], Patricia Thomas, MD, FACP[2], and Mamta Singh, MD, MS, FACP[1,3]

[1]Case Western Reserve University, School of Medicine, 9501 Euclid Ave, 401J, Cleveland, OH, USA; [2]Johns Hopkins University, School of Medicine, Baltimore, MD, USA; [3]Veterans Affairs Northeast Ohio Healthcare System, Cleveland, OH, USA.

PURPOSE: To explore how early meaningful experiential learning in community settings impacted medical students' application of systems thinking, their perceptions of systems navigation, and their professional identity as health system change agents.

METHODS: Following an immersive Health Systems Science course, first-year medical students partnered with veterans or newly arrived refugee families and served as health system patient navigators embedded within primary care teams for a year. Across two cohorts, fifty-six students participated in the elective. Three voluntary focus groups were conducted each year for a total of six groups with 50 patient navigator students. Inductive content analysis of focus group transcripts was conducted.

RESULTS: Qualitative analysis produced three major themes: program impact on students, student impact on patients, and student perceptions of the role of healthcare providers. Students reported a rich understanding of social determinants of health. By improving patient awareness of health and well-being, building capacity to understand medical issues, and increasing medication adherence through teaching, students recognized their impact on patient care. The importance of interprofessional collaboration with social workers also emerged and helped shape students' understanding of how they as physicians are part of a coordinated team working toward better patient care.

INTRODUCTION

Health Systems Science (HSS), emerging as critical content in medical education, is defined as the fundamental understanding of how care is delivered, how healthcare professionals work together to deliver care, and how the health system can improve healthcare delivery, in addition to patient and community health outcomes.[1,2] HSS enables clinicians to incorporate "systems thinking" in their clinical problem-solving, with a deeper understanding of the context of a patient's illness and empowers them to advocate for systems change.[1] Systems thinking and advocacy are critical to addressing the inequities in health outcomes currently evident in the USA .[3]

HSS curricula enable students to broaden the view of their work through a systems' lens and develop their professional identity as health care leaders and advocates committed to improving individual, community, and population health.[4–6] Most educators believe that this learning should begin with early exposure to the health system while doing meaningful work in community-based settings.[6–8] Additionally, when introduced to community health systems in a learning context, students should bring value to that system in the form of additional expertise, meaningful patient care coordination, and/or patient advocacy.[9–11] Adding value to the system heightens student engagement and fosters the relationship between the medical school and the health

- The study explored the impact of early experiential learning in community settings on 56 medical students' application of systems thinking, their perceptions of systems navigation, and their professional identity as health system change agents.
- The findings revealed that the immersive Health Systems Science course, where students served as health system patient navigators, **led to a rich understanding of social determinants of health, improved patient care, and recognition of the importance of interprofessional collaboration in healthcare.**

Innovative approach in implementing health systems science:
Pre-clinical year studetns and ED patient interview

AEM Education and Training
A GLOBAL JOURNAL OF EMERGENCY CARE

Innovations Report

Introduction to Health Systems Science: Experiential Learning Through Patient Interviews in the Emergency Department

Nicolas T. Sawyer MD, MBA ✉, Aaron Danielson MD, MAS, Karnjit Johl MD, Donna M. Williams MD

- **UNITED (Understanding Needs in the Emergency Department)** was thus designed and implemented to introduce preclinical medical students to HSS through patient interactions in the emergency department (ED).
- The authors used qualitative analysis of students' written reflections to identify themes and insights from the UNITED experience.
- Based on the analysis of the data, the authors concluded that asking **preclinical students** to interview patients about their experience in the health care system leads to emotional activation and a subsequent stated desire to improve care delivery.

Source: Nicolas, T, Sawyer., Aaron, Danielson., Karnjit, K, Johl., Donna, M., Williams., Donna, M., Williams. Introduction to Health Systems Science: Experiential Learning Through Patient Interviews in the Emergency Department.. (2021).;5(2) doi: 10.1002/AET2.10512

Some interesting Thai experiences

Common concerns on lack of "system understanding/knowledge/thinking"

Community, social, preventive medicine exist in all schools with different emphasis but all share the common feature of "learning from community hospital settings"

AMA HSS matters less than "individual school" view of what is crucial for future doctor and where is most feasible to introduce/integrate "systems knowledge, system skills and systems thinking"

Ramathibodi

- Community medicine introducing more "management knowledge", in addition to "patient care in community setting", health promotion and some degree of "population medicine" (community survey),

- Clinical medicine foundation – patient journey, patient experiences, patient safety, teamwork and leadership)

- Primary care (quality improvement)

- Residency training – short courses to discuss about "system dimensions" of patient and providers experiences in patient care

Siriraj

- No explicit reference to HSS (no more time for new disciplins)
- Preventive medicine
- Patient safety is a topic where "system dimension" (non-technical

skills) is being taught in addition to various "technical aspect" dealing with biomedical and clinical sciences.

- Communication (breaking bad news)
- Leadership and team work in introduction to medicine
- Medical informatics as a component in "research and data analysis"

Schools with explicit mention of HSS in their curriculum

- **Naresuan** – 24 credits in "transformative learning" (experiential learning)
- BI – system-based learning and HSS as principles and emphasis of overall curriculum
- **PSU** – HSS is highlighted in the present curriculum
  - Fundamentals of HSS
  - Primary care
  - Family and community-vased care

Personal reflection

- HSS is partly "common sense", partly sciences. Emphasizing too much on sciences can make it too rigid.

- Complexity and systems thinking are core to better deploy the sciences parts,

- System interventions are less pre ise, less predictable compared to "hard technologies" that doctors are familiar with and much easier to deal with uncertainty and unintended consequences.

- Do we have "faculties" who understand HSS to the same degree as biomed and clinical sciences? If not how to build them up "quickly"?

- Thailand may have better advantage given the constant shift and evolution to make "med ed" more and more "systems linked".

HSS is good as a "framework" to let us "choose" what are still crucial to add and how to do it?

Integrating teaching of **HSS** in **"patient care"** as opposed to **"system analysis"** and **"criticism"** of health systems is crucial to make it relevant to both teachers and students