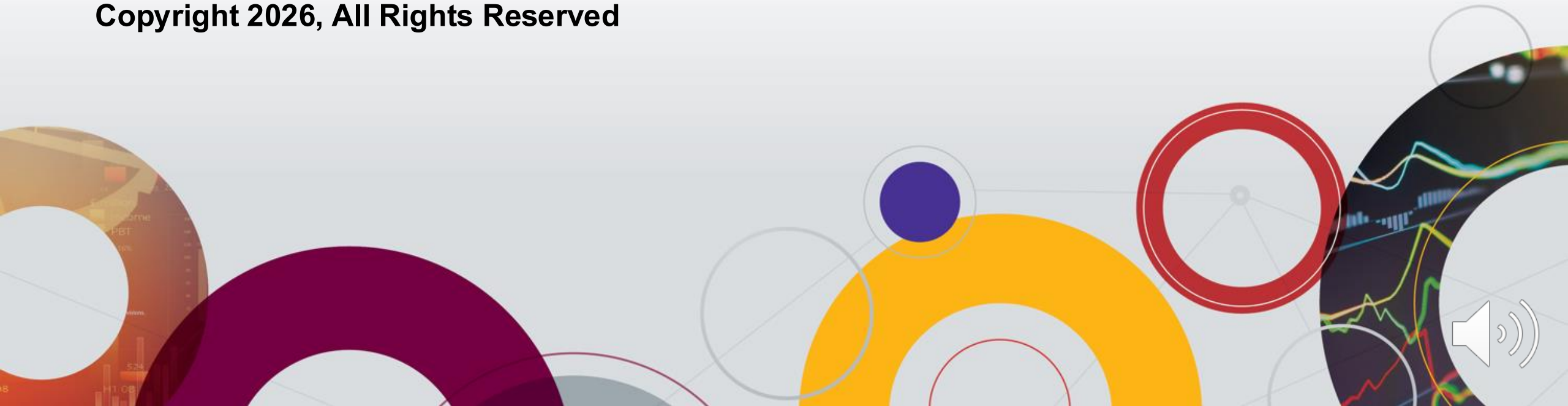


6.4 Population Health

10x10 – Introduction to Biomedical Informatics & Artificial Intelligence
William Hersh, MD, FACMI, FAMIA, FIAHSI
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Population health

Definitions

Activities and requirements for population health

Informatics tools to support population health

Definitions of population health

Best known: “the health outcomes of a group of individuals, including the distribution of health outcomes within the group” (Kindig, 2003)

Wilson (2017): “extends beyond the individual patient focus of traditional medical care and encompasses health outcomes of groups, communities, or populations of individuals”

Well-known textbook: *Population Health: Creating a Culture of Wellness*, 3rd Edition (Nash, 2019)

Definitions (cont.)

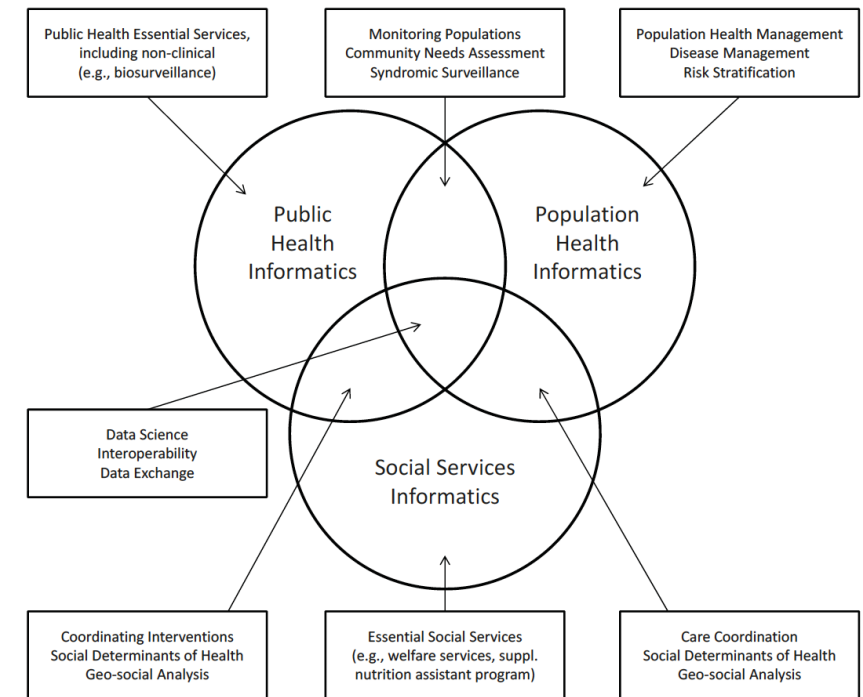
Population health composed of four major pillars (Nash, 2019)

- Chronic care management
- Quality and safety
- Public health
- Health policy

Has connection to public health (Gamache, 2018)

Healthcare plays only a modest role in impacting health of population (Magnan, 2017; DeSalvo, 2020)

Important role of nursing (Ariosto, 2018)



Population medicine (Lewis, 2014)

Emerging term: “the design, delivery, coordination, and payment of high-quality health care services to manage the Triple Aim for a population using the best resources we have available within the health care system”

Shifts focus of healthcare delivery from single patient to all patients under care

Examples of population health

Diabetes mellitus (Wilson, 2017)

- Data for panel of diabetic patients including pertinent laboratory results (e.g., Hemoglobin A1c), frequency of routine office visits, visits to emergency department or hospitalization, and maintenance of preventive care can be aggregated and analyzed
- To improve population health of (patient) panel, these data can be used to risk-stratify patients, to highlight needed process change in the clinic (if applicable), and to assign higher-risk patients to care management professionals

Hypertension (Berman, 2025)

- Reporting of left ventricular hypertrophy on ECG to population health coordinator increased rate of treatment in population

Aspects of healthcare undermining population health (Wilson, 2017; Bannow, 2021)

Focus on sick care over prevention and wellness

Siloed and fragmented efforts for health and healthcare

Inadequate assimilation and use of data

Suboptimal patient engagement

Reimbursement systems, incentives, education, and culture that support status quo

How population health impacts healthcare

Chronic diseases – long-lasting conditions that can be controlled but not cured, are most common and costly health conditions

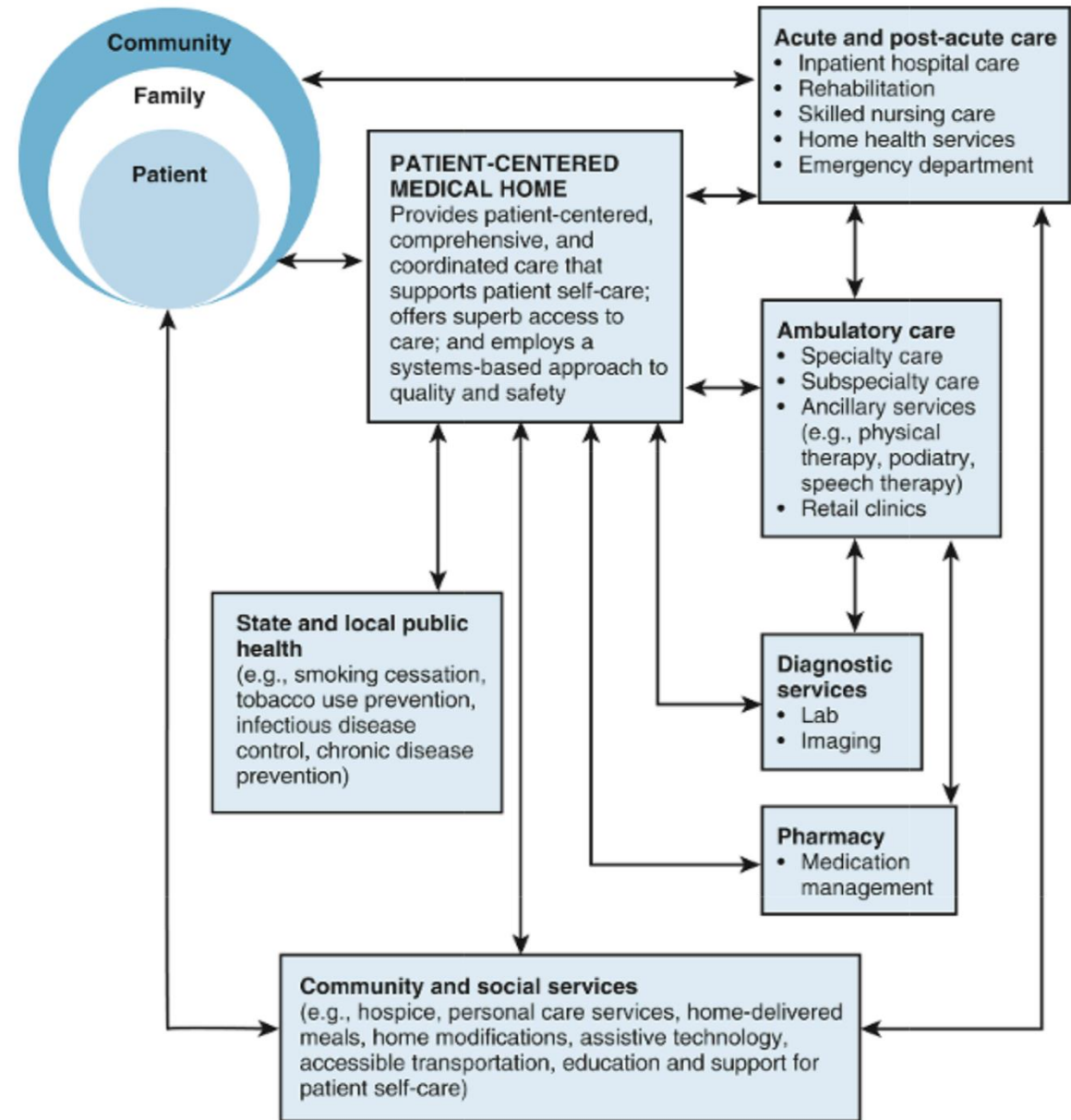
- e.g., obesity, diabetes, hypertension

Aging population

Impact of mental health on physical health

Health disparities – differences in health and health outcomes between groups of people (DeSalvo, 2020)

Move to patient-centered medical neighborhood (Taylor, 2011)?



Facilitators of population health (Nash, 2019)

Reimbursement models, e.g., value-based care

Informatics and analytics tools

Skilled workforce

Health promotion and behaviors

Consumer/patient engagement

Organizational culture

Accountability

Culture of health and wellness

Informatics tools supporting population health (Wilson, 2017)

Electronic health records

Analytics software

Patient portals

Wearable devices and biosensors

Telemedicine

And new professionals requiring support for their use

- Nurse care managers
- Community health workers
- Patient navigators



Precision population analytics (Tang, 2021)

Aim to complement clinical guidelines with identifying cohorts of similar patients in EHR for specific diseases

Clinicians presented with new options for treatments

Health system reported options and outcomes

