Tomorrow's Healthcare: Better Quality, More Affordable, More Accessible

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NATIONAL ACADEMY OF MEDICINE

Leadership • Innovation • Impact | *for a healthier future*

Global Challenges in Health and Medicine

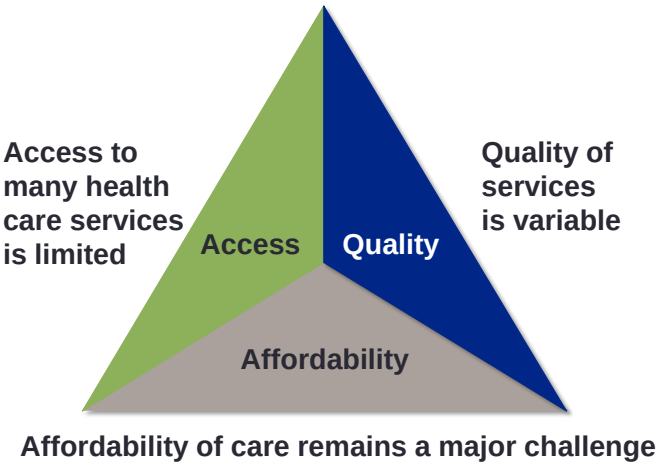
NCDs
Aging
Health Disparities
Emerging & Re-emerging Infections

Urbanization
Climate Change
Science & Technology & Data

Globalization
Emerging Infectious outbreaks
Democratization of Health

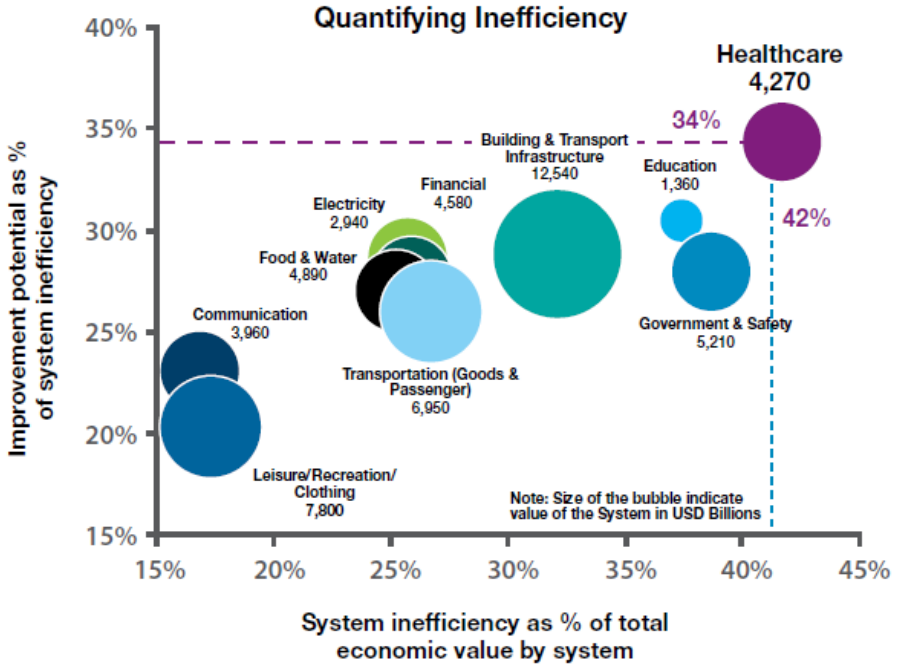
Health Care Challenges: Increasing Demand & Low Efficiency

The "Iron Triangle" of **access, quality and affordability** remain enduring challenges in healthcare globally



Affordability of care remains a major challenge

Leading the crop in inefficiency



Source: IBM - Redefining Quality and Success in Healthcare Feb 2012. Based on a IBM survey of 480 economists

Current State of Health & Medicine

- Slow to translate discoveries
- Medicines are Imprecise
- Care is fragmented
- Care is too expensive
- Variable quality & outcomes

Global Healthcare: Where We Want To Be

- Provide better care to all at lower cost
  - Meet the triple aim of health care: quality, cost, access
  - In part, this will mean strengthening primary care and public health
  - Reduce health disparities

- Need to move health care from:
  - Disease → Health and Wellness
  - Fragmentation → Integration
  - Treating organs → Treating the whole person
  - Hospital-based → Community-based
  - Patient-Focused
  - Democratized

- Population Health

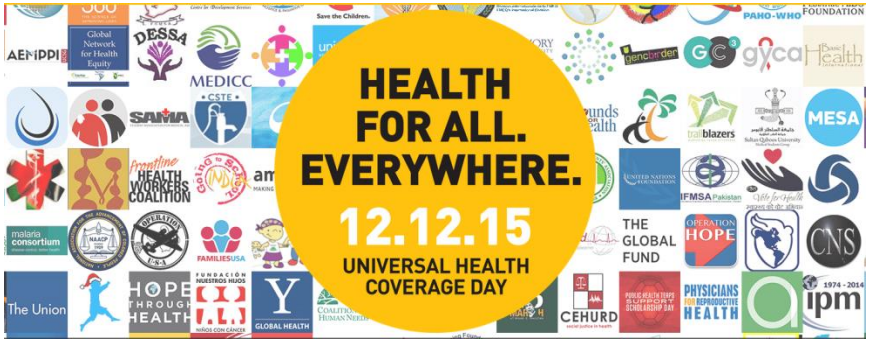
Healthcare Needs Reform/Transformation

- Universal Health Coverage
- Quality of care
- New models of care
- Prevention & Health Promotion
- Personalized & Precision Medicine

Universal Health Coverage

Efforts toward universal health coverage:

- Post-2015 UN Development Agenda
- In 2014, more than 500 leading health and development organizations launched a coalition to accelerate access to universal health coverage



Global coalition calls for acceleration of access to universal health coverage

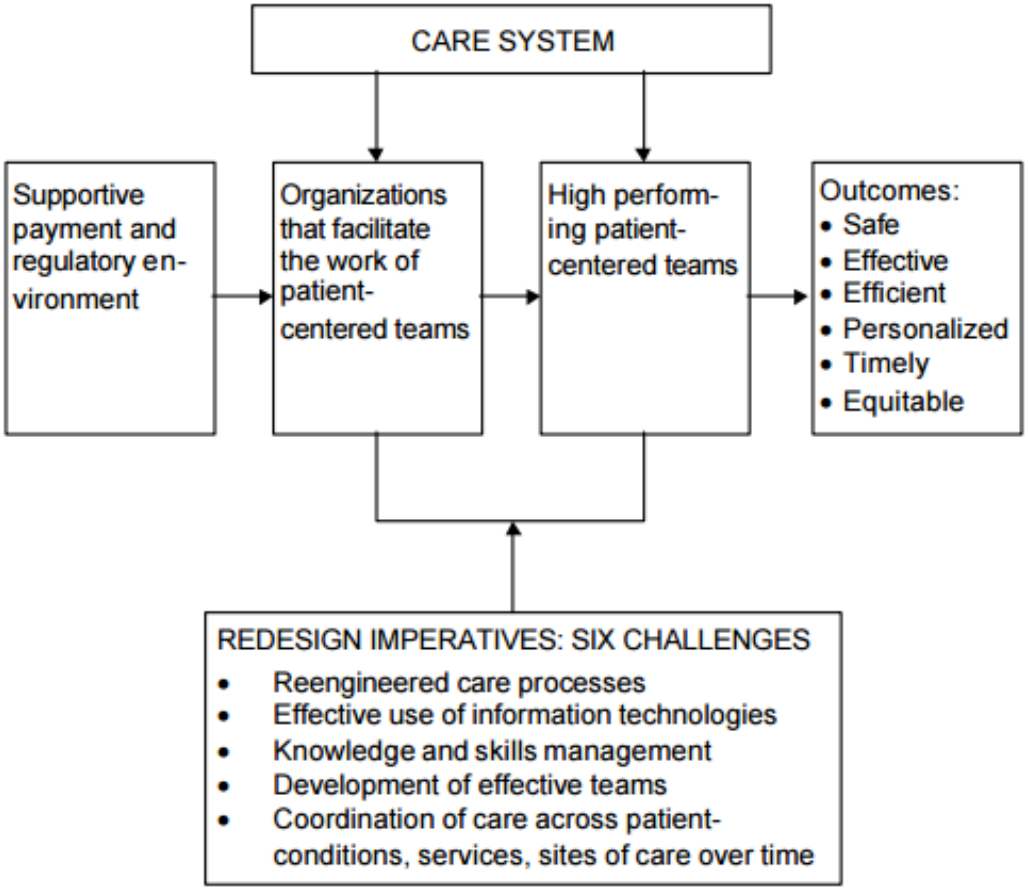
A new global coalition of more than 500 leading health and development organizations worldwide is urging governments to accelerate reforms that ensure everyone, everywhere, can access quality health services without being forced into poverty. The coalition emphasises the importance of universal access to health services for saving lives, ending extreme poverty, building resilience against the health effects of climate change and ending deadly epidemics such as Ebola.

IOM Work on Quality

Health system should have six goals:

1. Safety
2. Effectiveness
3. Patient-centeredness
4. Timeliness
5. Efficiency
6. Equity

Crossing the Quality Chasm: Redesign a New Health System for the 21st Century



Global Health Reform

- The role of government, as payer, regulator, and market-shaper, is growing.
- Many governments are introducing broad reforms to health care systems
  - US
  - China
  - India
  - South Africa
  - Mexico
  - Rwanda

United States

Patient Protection and Affordable Care Act (2010)

- Expanded **Medicaid coverage** and introduced mandatory health insurance (**Health Insurance Exchanges**) in an effort to increase coverage and slow the rise in health care costs
- Reduces Medicare spending by $600B+ over 10 years

Since 2010, 20 million Americans have gained health care coverage

- 17.7 million nonelderly adults (ages 18 to 64)
- 2.3 million young adults (ages 19 to 25)

The uninsured rate for non-elderly adults declined by 43 percent between October 2013 and early 2016 (from 20.3 percent to 11.5 percent).

Health Insurance Market Reforms

- Require most U.S. citizens and legal residents to have health insurance
  - Create state-based Exchanges through which individuals can purchase coverage, available to individuals/families with income between 133-400% of the federal poverty level and create separate Exchanges through which small businesses can purchase coverage
  - Premium and cost sharing credits available
- Expand Medicaid to 133% of the federal poverty level
- End preexisting condition exclusion
- Coverage for adult children until age 26

Health Insurance Exchanges

- Online marketplaces for individuals and small businesses to buy health insurance
  - Make comparison shopping easier through transparency
- Managed by federal government and states
- Four benefit categories of plans plus a separate catastrophic plan to be offered through the Exchange
  - Bronze: 60% of full actuarial value benefits
  - Silver: 70% of full actuarial value of benefits
  - Gold: 80% of full actuarial value of benefits
  - Platinum: 90% of full actuarial value of benefits
  - Catastrophic plans (low premium, high deductible) available to some (e.g., under 30 or those who qualify for hardship wavers)

US Affordable Care Act: Healthcare and Payment Reform

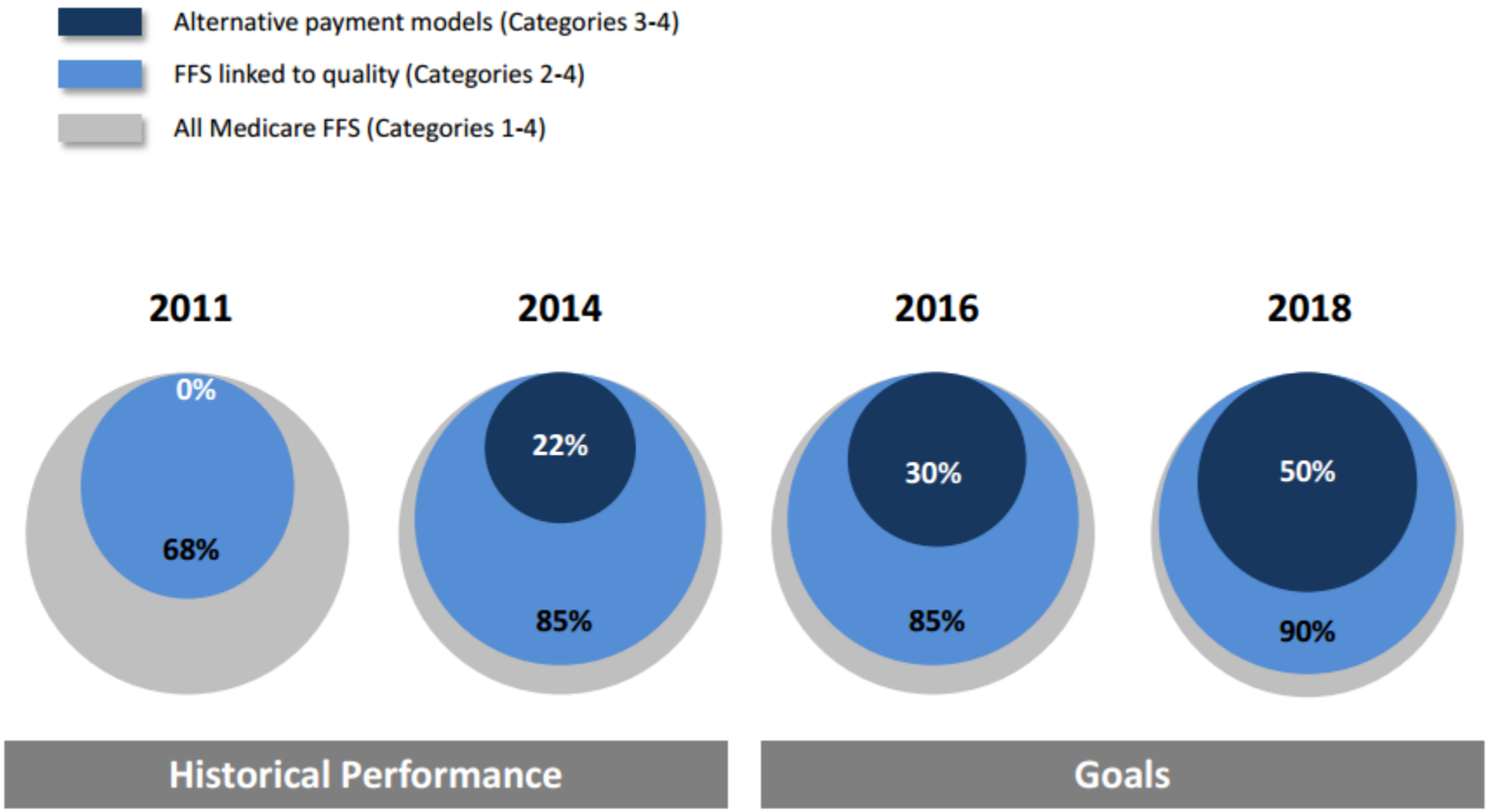
- Value-based purchasing
- Bundle payments
- Care coordination and continuum
- Medical Homes and care management
- Shared Savings, Accountable Care Organizations
- Prevention
- Health IT, Data Transparency

HHS
Better Care. Healthier People. Smarter Spending

From current FFS to FFS linked to quality to APM to population based payment

	Payment Taxonomy Framework			
	Category 1: Fee for Service -No Link to Quality	Category 2: Fee for Service - Link to Quality	Category 3: Alternative Payment Models Built on Fee-for-Service Architecture	Category 4: Population-Based Payment
Medicare FFS	▪ Limited in Medicare fee-for-service ▪ Majority of Medicare payments now are linked to quality	▪ Hospital value-based purchasing ▪ Physician Value-Based Modifier ▪ Readmissions/Hospital Acquired Condition Reduction Program	▪ Accountable care organizations ▪ Medical homes ▪ Bundled payments ▪ Comprehensive primary care initiative ▪ Comprehensive ESRD ▪ Medicare-Medicaid Financial Alignment Initiative Fee-For-Service Model	▪ Eligible Pioneer accountable care organizations in years 3-5

HHS Value-Based Payment Goals



Care Redesign

- Care continuum
- Care coordination and management
- Integrating primary care and public health
- Addressing the social determinants of health
- Community health
- Population health
  - Emphasis on health of the population and improving health status

Importance of Alignment & Accountability

- The need for integration comes in the sharing of responsibility for outcomes
- Drivers of Success:
  - EHR & Data
  - Alignment & Accountability: Shared incentives & risks
- How do all parts of the ecosystem get the expected outcomes?
  - *Must manage patients together through the continuum*
  - *A focus on disease management is a shared responsibility (payer, provider, industry)*
  - *Patient accountability*
- What are the financial tools needed?
  - *Incentivize quality and patient satisfaction*
  - *Share in savings*
  - *Share in risks*

The emerging model is Accountable Care Organizations

Accountable Care Organizations (ACOs)

- Groups of doctors, hospitals, and other health care providers, who come together voluntarily to give coordinated high quality care to their patients
- Multiple providers assume joint accountability to improving health care quality and slow the growth of health care costs

Accountable Care Organizations (ACOs)

N~ 800

CMS offers several ACO programs

- Medicare Shared Savings Program
- Advance Payment ACO
- Pioneer ACO

Commercial ACOs

- Cigna, UnitedHealth, Aetna, and others
- Account for 54% of accountable care payment arrangements

Leavitt, 2015

Hospital Acquired Conditions 2010-2014

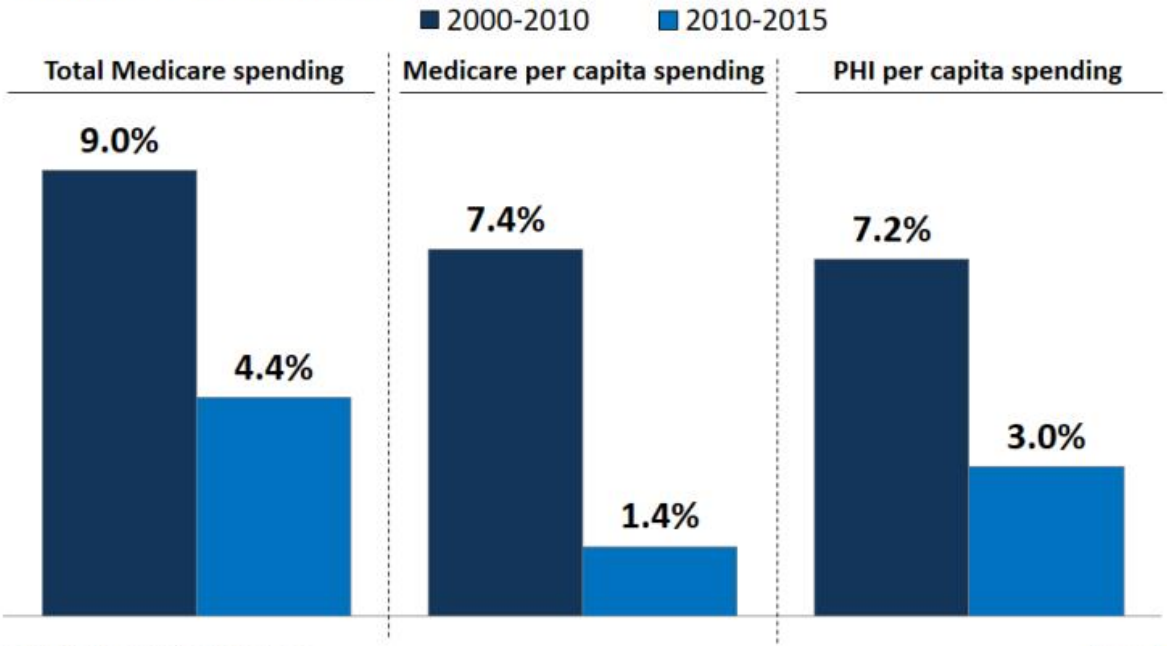
- Interim estimates for 2014 show a sustained 17 percent decline in hospital-acquired conditions (HACs) since 2010
- A cumulative total of **2.1 million fewer HACs** were experienced by hospital patients over the 4 years
- The measured interim rate for 2014 held steady from 2013 at 121 HACs per 1,000 discharges, down from 145 in 2010
- Nearly 87,000 fewer patients died in the hospital as a result of the reduction in HACs and that approximately $19.8 billion in health care costs were saved from 2010 to 2014

Adverse Drug Events	Pressure Ulcers	Catheter Associated Urinary Tract Infections	Surgical Site Infections	Falls
39.8% ↓	28.0% ↓	16.1% ↓	2.9% ↓	2.4% ↓

Bending the Cost Curve

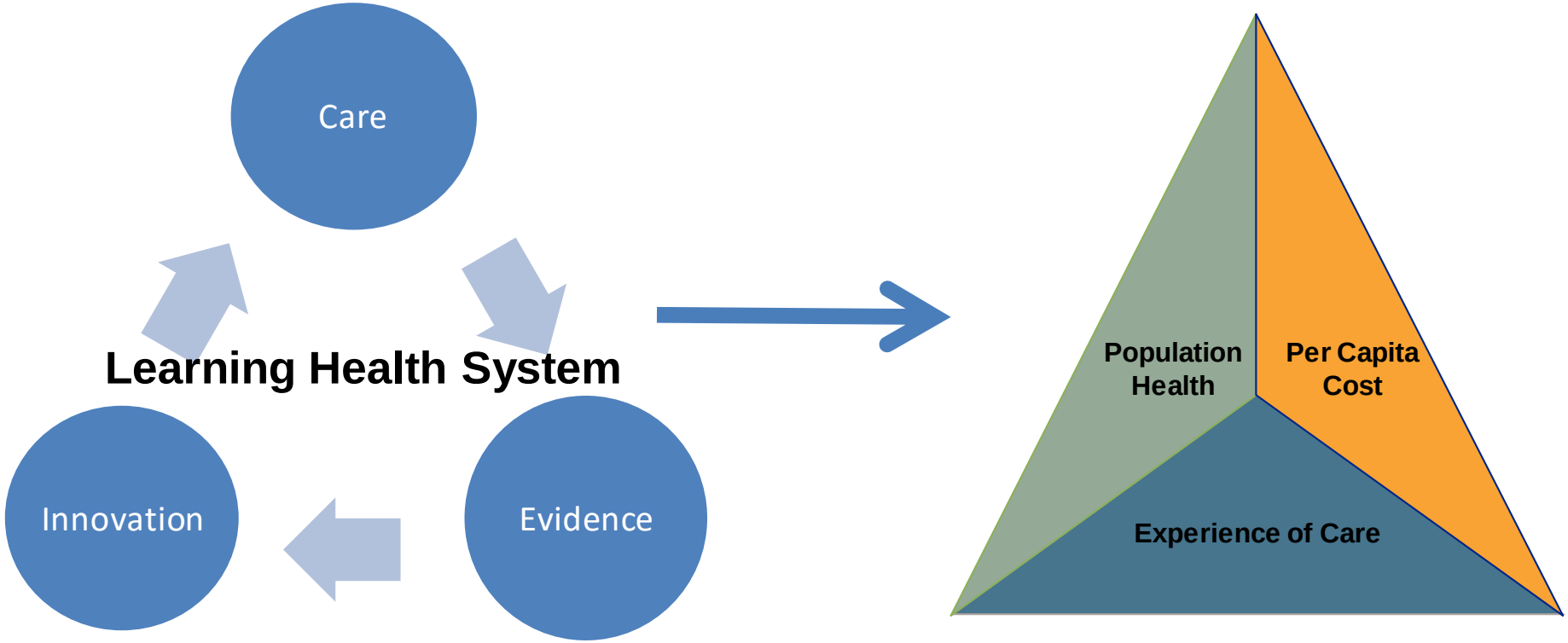
Figure 3

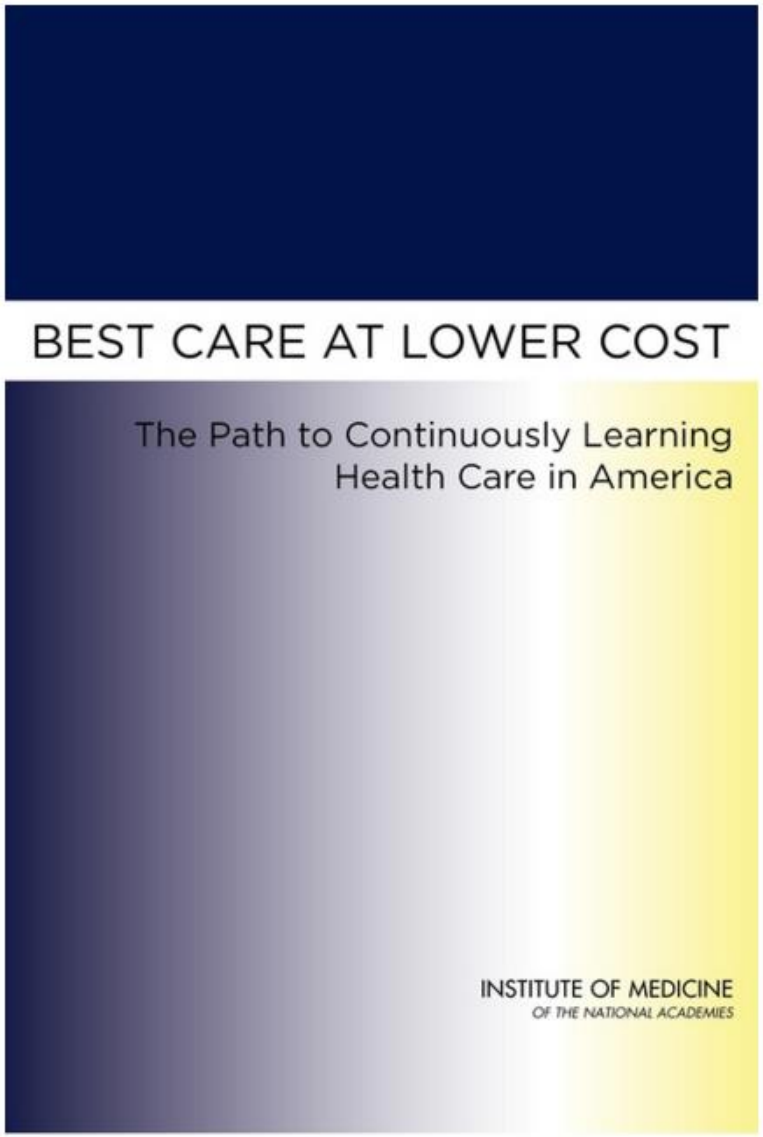
Average Annual Growth Rates in Medicare and Private Health Insurance Spending, 2000-2015



NOTE: PHI is private health insurance.
SOURCE: Kaiser Family Foundation analysis of Medicare spending data from Boards of Trustees; private health insurance spending data from the CMS National Health Expenditure data.

The Vision
Best care at lower cost
Need for a Learning Health System





A continuously learning health care system "is one 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." (*IOM, *Best Care at Lower Cost)

The Leadership Consortium for Value & Science-Driven Health Care (formerly the Roundtable on Value & Science-Driven Health Care)

The Learning Health System Series

Roundtable on Value & Science-Driven Health Care

INSTITUTE OF MEDICINE
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Advising the nation • Improving health

The Learning Health System Series

Continuous improvement and innovation in health and health care

To facilitate progress toward the development of a *learning health system*—in which science, informatics, incentives, and culture are aligned for continuous improvement and innovation, with best practices seamlessly embedded in the delivery process and new knowledge captured as an integral by-product of the delivery experience—the Roundtable on Value & Science-Driven Health Care has marshaled the insights of the nation's leading experts to explore in detail the prospects, and the necessity, for transformational change in the fundamental elements of health and health care. The assessments are reported in the 15 volumes of the IOM *Learning Health System Series*, published by the National Academies Press.

VISION

Vision. *The Learning Healthcare System*, the first in the series, explores the various dimensions—evidence development and standards, care culture, system design and operation, health data, clinical research, information technology, value—on which emerging insights and scientific advances can be applied for health care in which both evidence development and application flow seamlessly and continuously in the course of care.

THE DATA UTILITY

The Data Utility. *Clinical Data as the Basic Staple of Health Learning: Creating and Protecting a Public Good* identifies the transformational prospects for large interoperable clinical and administrative datasets to allow real-time discovery on issues ranging from disease etiology to personalized diagnosis and treatment. Also explored are key priorities for data stewardship if clinical data are to be a carefully nurtured resource for continuous learning and better care.

EVIDENCE

Evidence. *Learning What Works: Infrastructure Required for Comparative Effectiveness Research* assesses the nature and magnitude of needed capacity for new knowledge and evidence about what care works best under different circumstances, including the necessary skills and workforce, data linkage and improvement, study coordination and results dissemination, and research methods innovation.

SYSTEMS ENGINEERING

Systems Engineering. *Engineering a Learning Health System: A Look at the Future* reviews transferable lessons from the systems and operations engineering sciences applicable for improving the organization, structure, and function of the delivery, monitoring and change processes in health care—in effect, engineering approaches to continuous feedback and improvement on quality, safety, knowledge, and value in health care.

CARE COMPLEXITY

Care Complexity. *Evidence-Based Medicine and the Changing Nature of Health Care* explores the forces, such as genetic insights and increasing care complexity, driving the need for better medical evidence; the challenges with which patients and providers must contend; the need to transform the speed and reliability of new medical evidence; and the legislative and policy changes that could enable evolution of an evidence-based, learning system.

EFFECTIVENESS RESEARCH

Effectiveness Research. *Redesigning the Clinical Effectiveness Research Paradigm: Innovation and Practice-Based Approaches* reviews the growing scope and scale of the need for clinical effectiveness research alternatives, the limits of current approaches, the potential for emerging research and data networks, innovative study designs, and new methods of analysis and modeling.

DIGITAL PLATFORM

Digital Platform. *Digital Infrastructure for the Learning Health System: The Foundation for Continuous Improvement in Health and Health Care* explores current efforts and opportunities to accelerate progress in improving health and health care, and identifies priority follow-up action targets: technical innovation; data and research insights; patient and public engagement; and stewardship and governance.

PATIENTS & THE PUBLIC

Patients & the Public. *Patients Charting the Course: Citizen Engagement and the Learning Health System* assesses the prospects for improving health and lowering costs by advancing patient involvement in the elements of a learning health system, and underscores the centrality of communication strategies that account for and engage individual perspectives, needs, preferences, understanding, and support necessary to mobilize change.

COST & OUTCOMES

Cost & Outcomes. *The Healthcare Imperative: Lowering Costs and Improving Outcomes* presents a 6-domain framework for understanding and estimating excess healthcare costs: unnecessary services, inefficiently delivered services, excessive administrative costs, prices that are too high, missed prevention opportunities, and medical fraud. Additionally, the volume summarizes estimates of the excessive costs, reviews approaches to their control, and considers ways to reduce health expenditures by 10% within 10 years, without compromising health status or valued innovation.

VALUE

Value. *Value in Health Care: Accounting for Cost, Quality, Safety, Outcomes, and Innovation* explores alternative perspectives and approaches for defining, estimating, and attaining value in health care, including case studies on value-enhancing strategies in development—e.g. value-based insurance design, accountable care organizations—and emphasizing the basic need for broad transparency as to cost, quality, and outcomes in care.

DATA QUALITY

Data Quality. *Digital Data Improvement Priorities for Continuous Learning in Health and Health Care* presents the current deficiencies in the reliability, availability, and usability of digital health data and considers strategies, priorities, and responsibilities to address such deficiencies, as the totality of available health data is a crucial resource that should be considered an invaluable public asset in the pursuit of better care, improved health, and lower health care costs.

LEADERSHIP

Leadership. *Leadership Commitments to Improve Value in Healthcare: Finding Common Ground* presents discussions of opportunity statements from those in key health stakeholder sectors—patients, clinicians, health organizations, insurers, product manufacturers, employers, government, IT, and researchers—on priority actions they can and will undertake cooperatively to transform quality and value in health care.

CORE METRICS

Core Metrics. *Core Measurement Needs for Better Care, Better Health, and Lower Costs: Counting What Counts* considers needs, approaches, and metrics most important for tracing progress on care that is better quality, lower cost, and yields better health outcomes, and accounts for factors influencing the implementation of core measure sets, including the data infrastructure, resources, and policies that are needed for the use of core metrics across independent organizations and providers.

OBSERVATIONAL STUDIES

Observational Studies. *Observational Studies in a Learning Health System* reviews leading approaches to observational studies and how to chart the course for the use of this growing utility in the most responsible fashion possible by considering how they can be made more rigorous and internally valid, how to deal with bias, the use of observational studies to generalize findings from randomized controlled trials, and how to evaluate treatment heterogeneity.

LARGE SIMPLE TRIALS

Large Simple Trials. *Large Simple Trials and Knowledge Generation in a Learning Health System* presents the pros and cons of the design characteristics of large simple trials (LSTs), explores the utility of LSTs on the basis of case studies of past successes, and considers the challenges and opportunities for accelerating the use of LSTs in the context of a US clinical trials enterprise.

Consensus Report

BEST CARE

Best Care. *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America* explores the central challenges to health care today and identifies three major imperatives for change: the rising complexity of modern health care, unsustainable cost increases, and outcomes below the system's potential, and points out that emerging tools like computing power, connectivity, team-based care, and systems engineering techniques—tools that were previously unavailable—make the envisioned transition possible, and are already being put to successful use in pioneering health care organizations.

Learning Health System

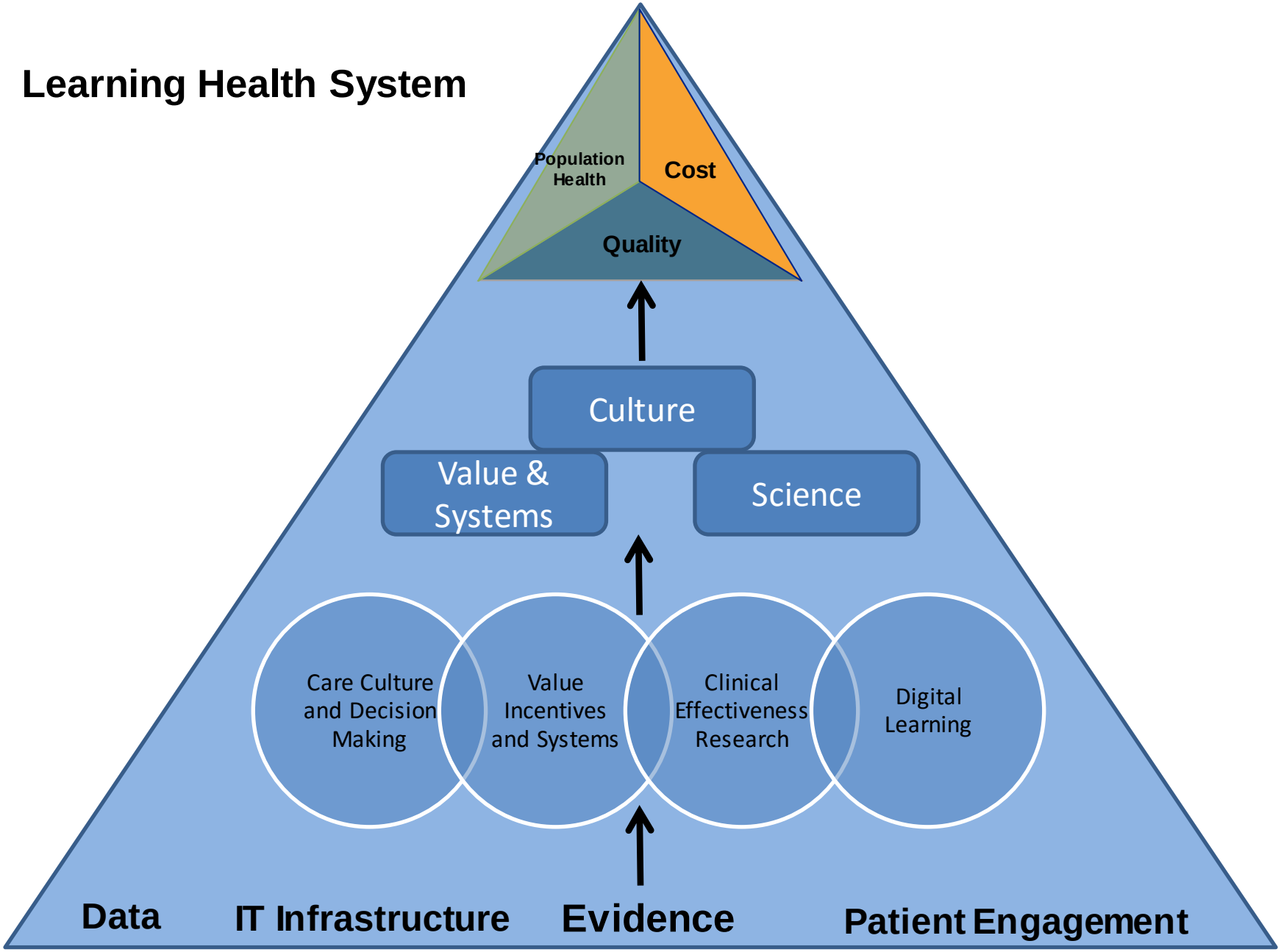
A learning health care system is designed to:

- deliver the best evidence at the point of care for collaborative choices of each patient and provider;
- drive the process of real-time discovery as a natural outgrowth of patient care; and
- ensure innovation, quality, safety, and value in health care

Learning Health System

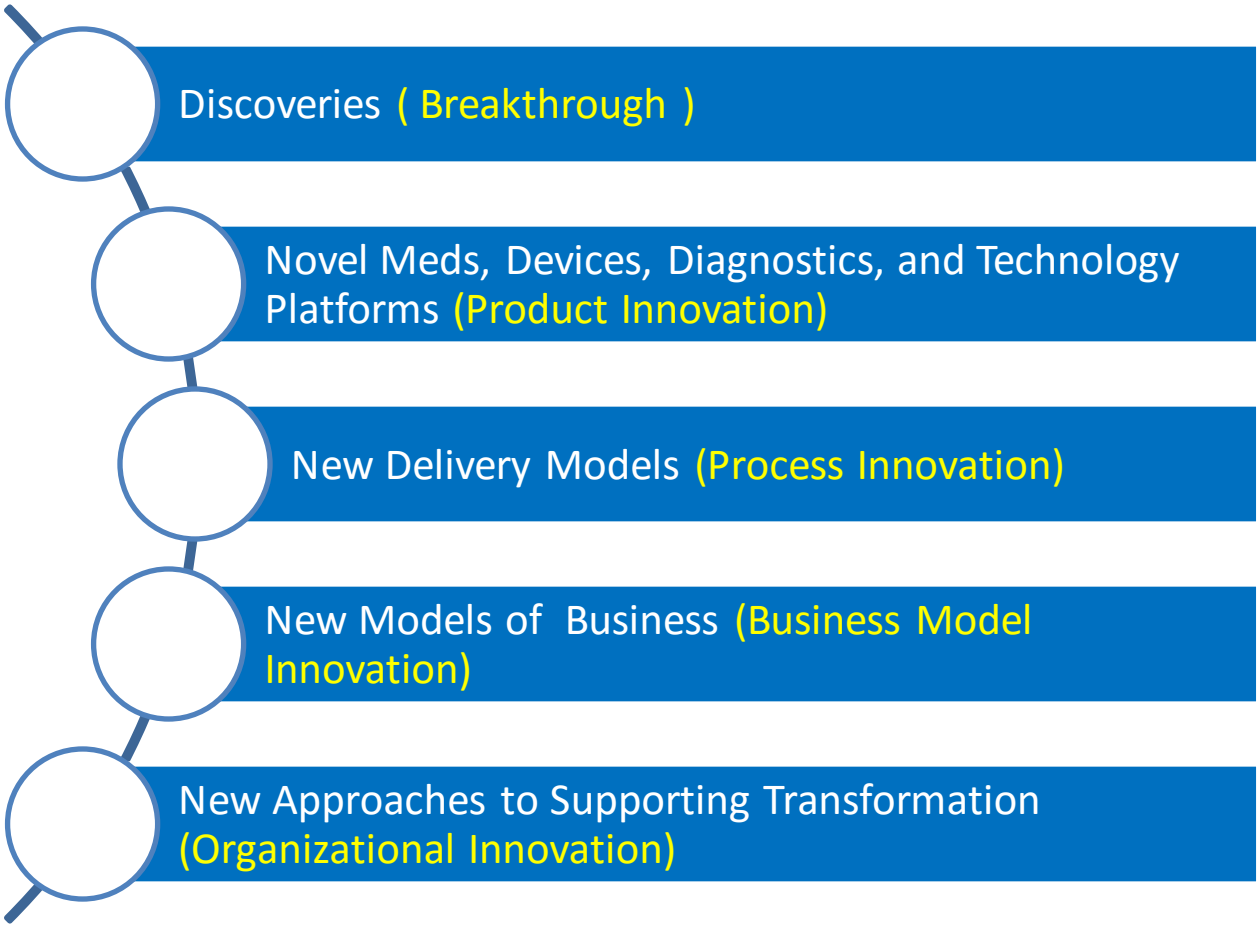
- Integrates research and clinical care to develop care redesign
- All members of the system collaborate
- Real time access to knowledge
- Data is linked and mined for research
  - Use of large datasets and informatics to improve health
- Improves individual and population health

Learning Health System



Transformation will Need Innovation

Health & medicine innovation spectrum



Technology Innovation: Health in the Digital Age

- **Electronic health records (EHRs)** – drive a learning health system
  - aggregate the information rich environment which includes clinical, administrative, claims, and research data; leverage this data, and use it to inform clinical decision making
- **Biosensors** – "biological sensor"
- **Telemedicine/remote monitoring** - use of technology to provide health care at a distance
- **mHealth** – software applications on mobile devices designed to support medicine and health
- **Diagnostic devices** - Medical devices that enable early detection and quick diagnosis
- **Robotics**
- **Big data and analytics**
- **Artificial Intelligence**

Traditional approach: entities are fragmented and silo'ed:

- Community
- Public Health
- General Practitioners
- Hospitals
- Academics

A better approach: Integrated/Aligned Care

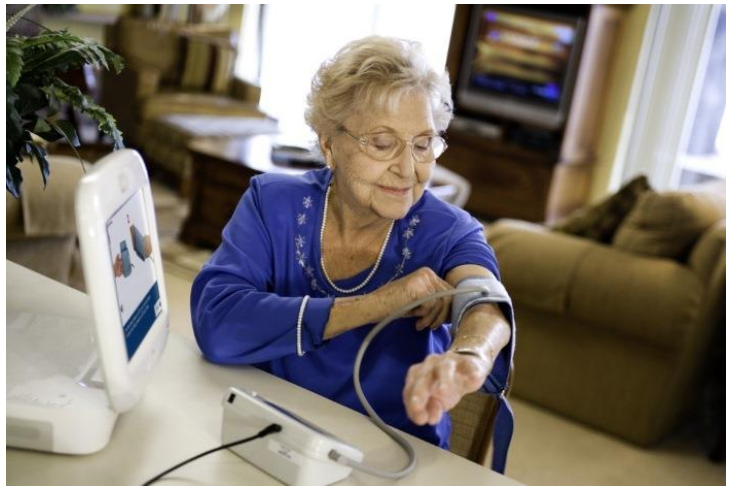
- To align care, drive innovation and improve population health.

Drivers of Success:

Using technology innovation so providers can reach patients at work or at home to engage them in a care plan, manage their care remotely, and pursue a patient-centered approach that incorporates shared-decision making.

E-home care for the elderly

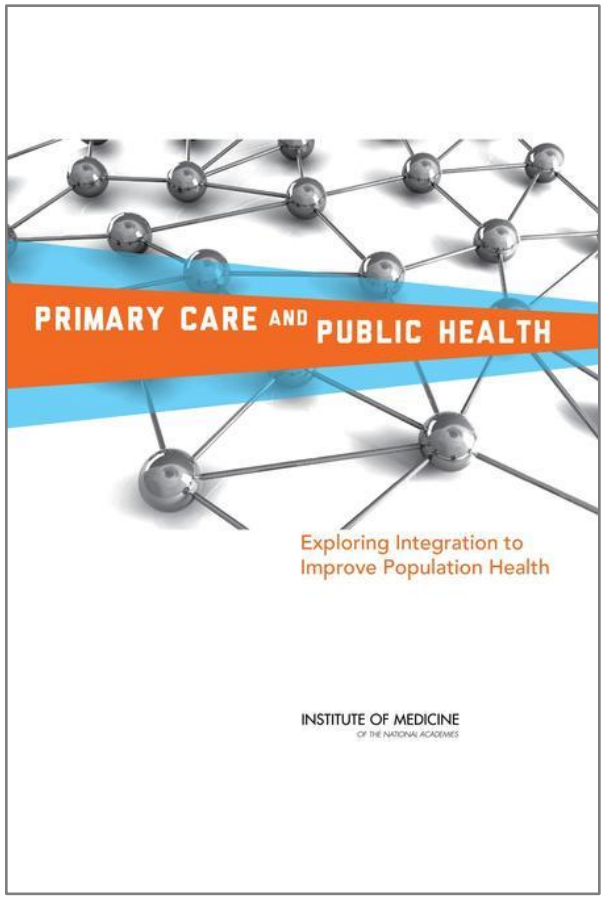
- Remote monitoring technologies can enable health care delivery beyond the traditional care continuum



Key Areas to Develop

- Health Promotion
- Public health & care delivery
- Population health
- Precision Medicine

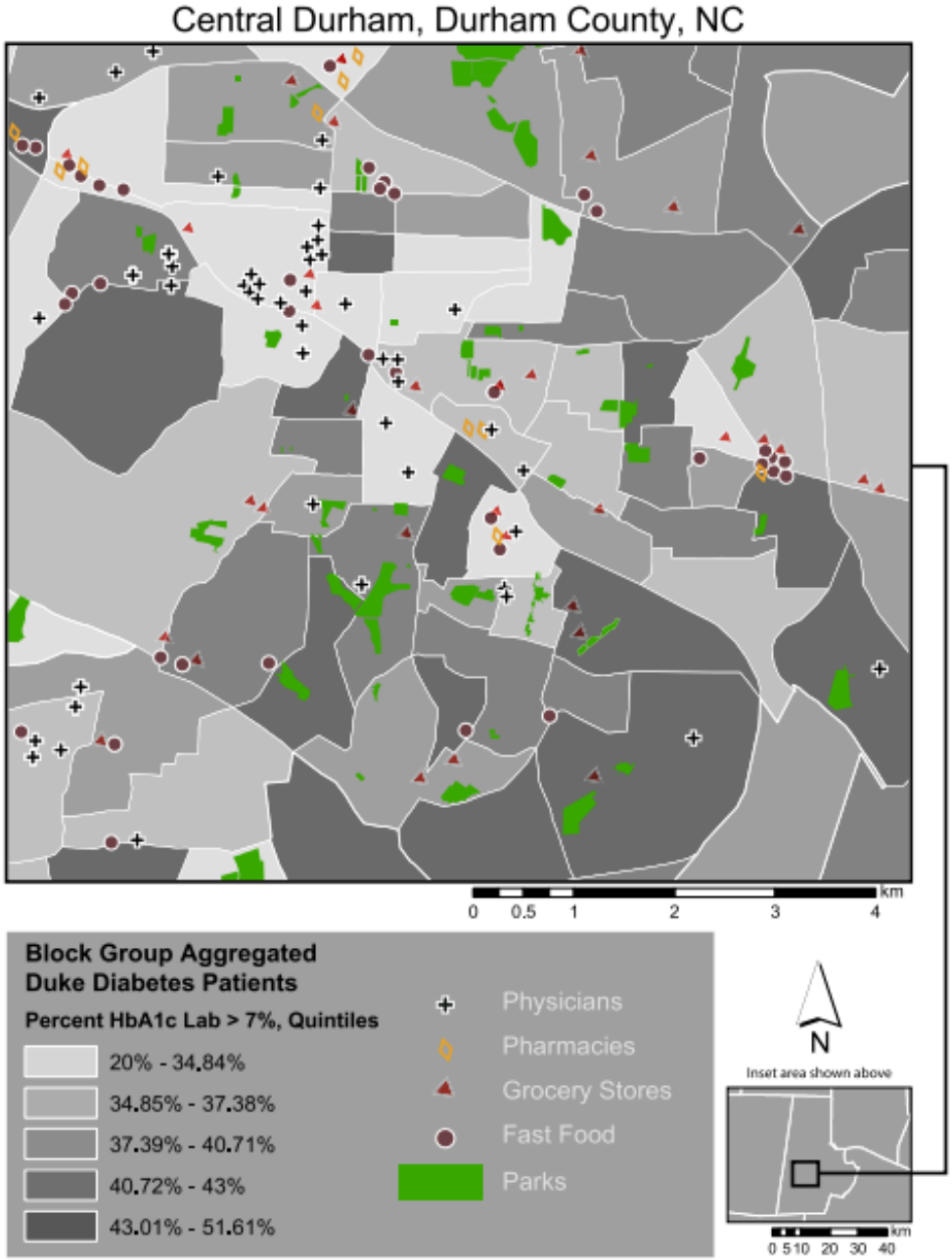
Integrate public health & health care delivery



Core principles for successful integration:

- A shared goal of population health improvement
- Community engagement in defining and addressing population health needs
- Aligned leadership that
  - bridges disciplines, programs, and jurisdictions to reduce fragmentation and foster continuity,
  - clarifies roles and ensures accountability,
  - develops and supports appropriate incentives, and
  - has the capacity to manage change
- Sustainability, key to which is the establishment of a shared infrastructure and building for enduring value and impact
- Sharing and collaborative use of data and analysis

Geospatial Mapping



Spratt et al., 2015

Achieving Population Health

- Health care is only a small factor in determining health.
- Achieving population health equity will require short and long term actions on behalf of policy makers at federal and state levels, non-profit organizations, health systems, individuals, and communities
  - Addressing the social determinants of health
  - Addressing disparities in access
  - Addressing disparities in quality

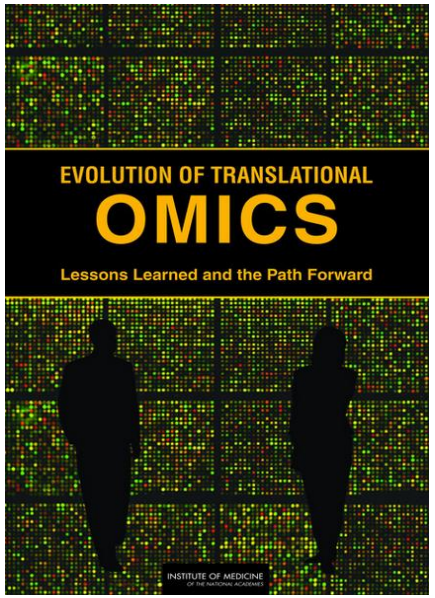
IOM Work on Health Equity

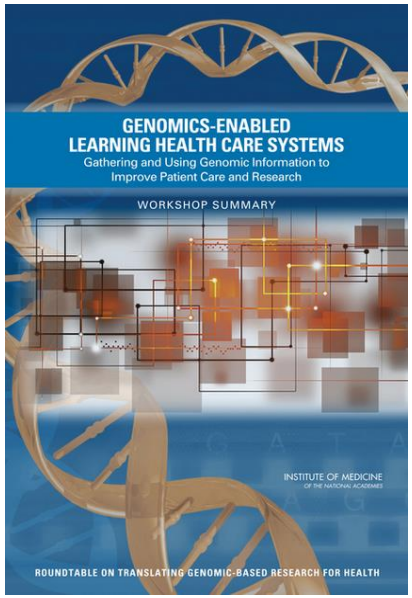
- Board on Population Health and Public Health Practice
  - Roundtable on the Promotion of Health Equity and the Elimination of Health Disparities
  - Roundtable on Population Health Improvement

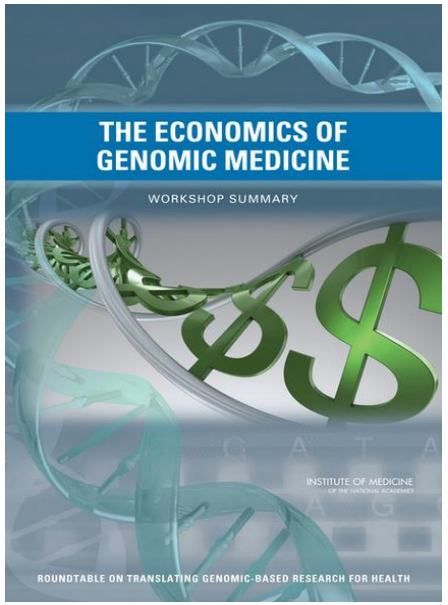
Creating Value: The Promise of Personalized Medicine

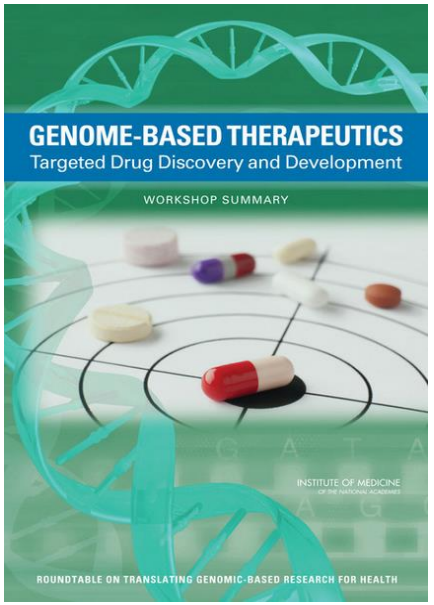
- Healthcare delivery systems must put patients at the center and figure out how to accurately deliver preventive care, diagnose early, and offer targeted treatments.
- The promise of personalized medicine is consistent with this approach.

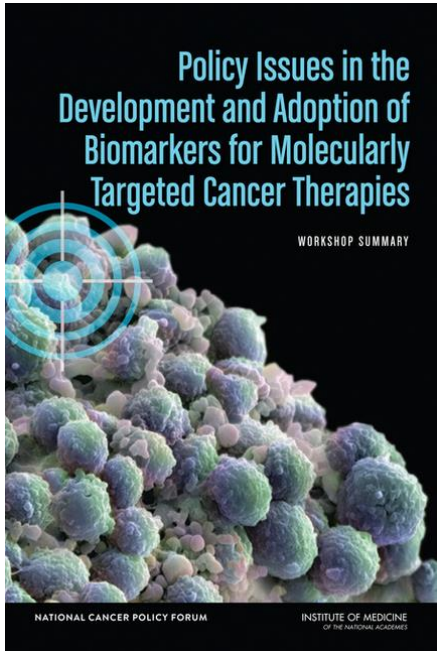
IOM Work on Precision Medicine

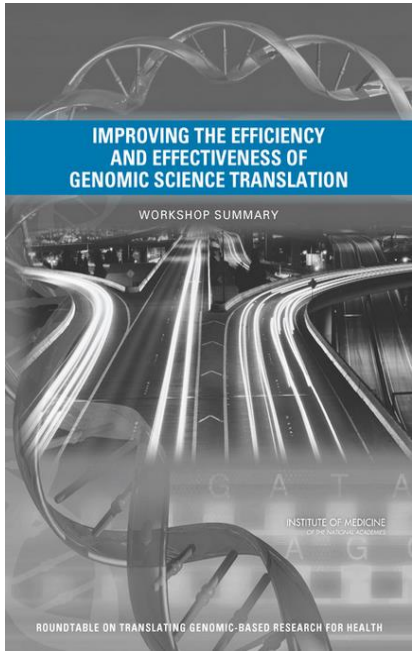


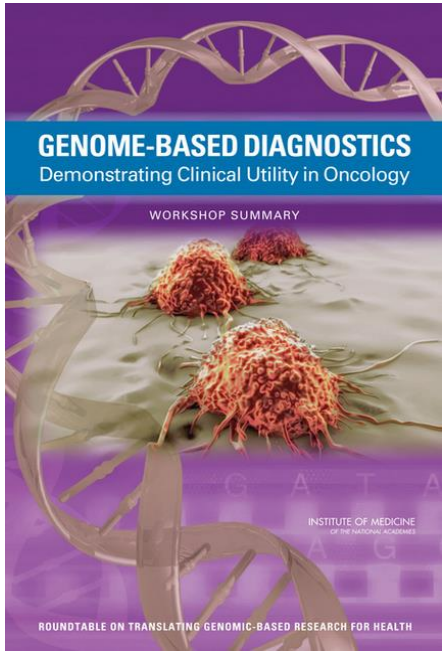


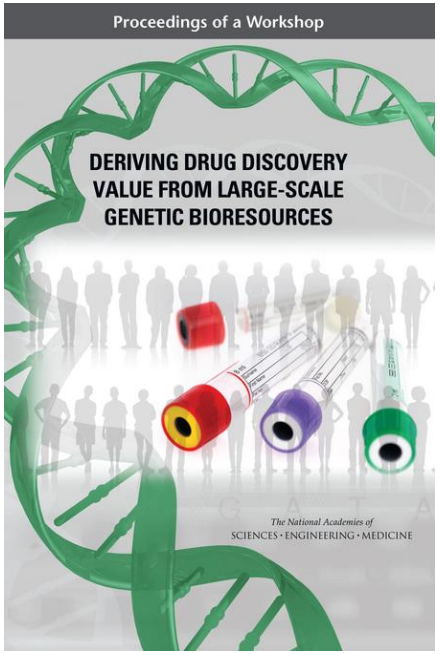








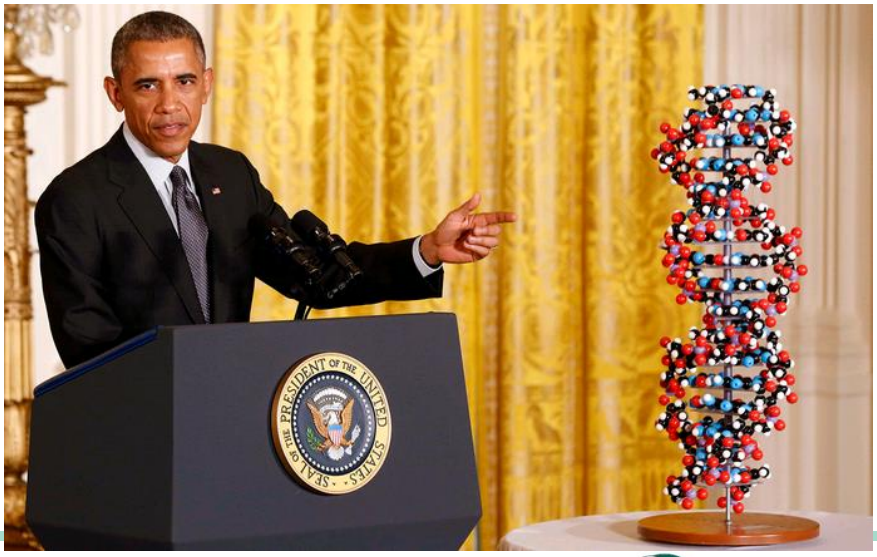




US Precision Medicine Initiative

Objectives of the initiative:

- More and better treatments for cancer
- Creation of a voluntary national research cohort
- Commitment to protecting privacy
- Regulatory modernization
- Public-private partnerships



Lancet: The Promise of Personalized Medicine

Aligning incentives to fulfil the promise of personalised medicine

Victor J Dzau, Geoffrey S Ginsburg, Karen Van Nuys, David Agus, Dana Goldman

Lancet 2015; 385: 2118–19

Published Online
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S0140-6736(15)60722-X

Personalised medicine has generated global policy interest in the past few years. In 2012, the European Union established the European Alliance for Personalised Medicine with the aim to accelerate the development, delivery, and uptake of personalised health care, broadly the Centers for Medicare and Medicaid Services, National Institutes of Health, and the MacArthur Foundation, and has been used to assess the long-term consequences of medical innovation in many settings, including cardiovascular disease, diabetes, cancer, and obesity.[2]

Lancet: The Promise of Personalized Medicine

- The full promise of personalized and precision medicine extends beyond targeting therapies for patients who are already ill
- Enable prevention by identifying individuals at risk of disease

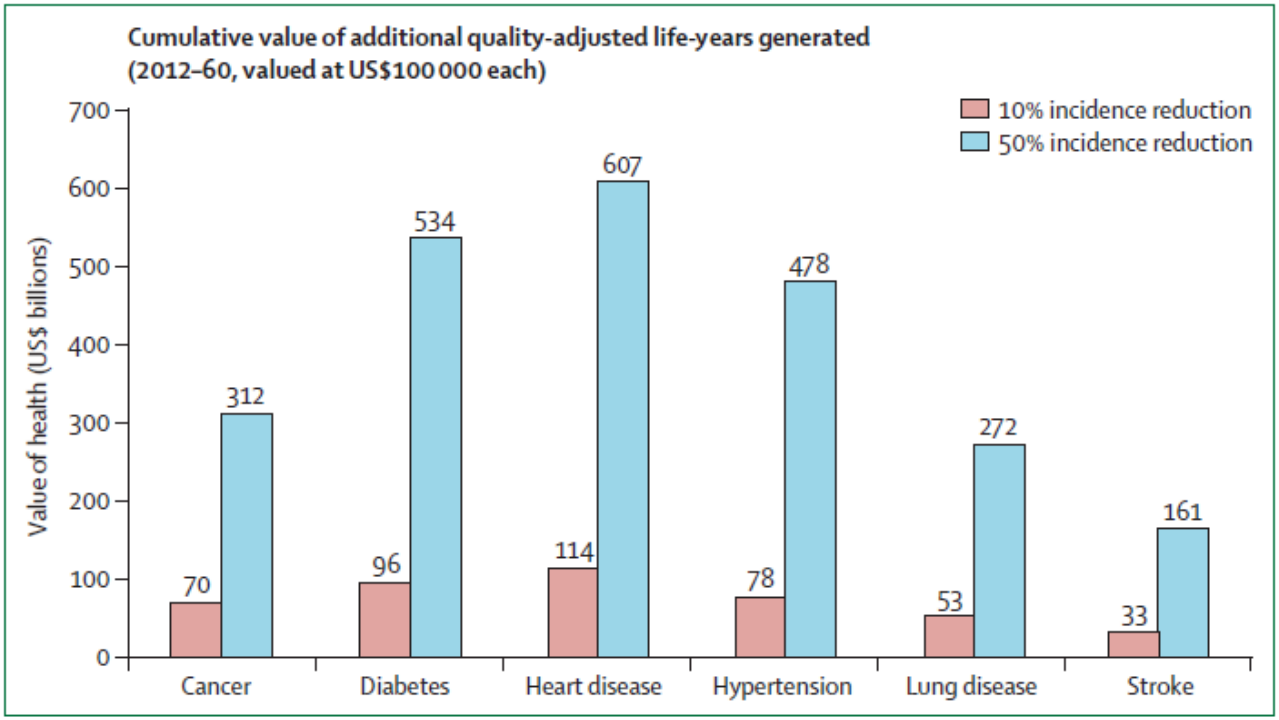

Figure: Value of health from hypothetical personalised and precision medicine prevention innovation at two levels of incidence reduction in six diseases in the USA ($ billions)

Precision Medicine

- Emphasize prevention & early detection
- Integration of technology with healthcare & population health
- Data sharing, data ownership, data security
- Ethics & Regulation
- Impact on cost of care

Vital Directions for Health & Healthcare

- **Better health and well-being**, e.g.,
  - Life course
  - Addressing health disparities and social determinants of health
  - Improving physical activity, nutrition, and other prevention programs
  - Integrating mental health and substance abuse services throughout care
- **High value health care**, e.g.,
  - Competencies and tools to shift payments from volume to value and outcomes
  - Precision medicine and advances in genomics, proteomics, and information
  - Patients, families, communities and the democratization of health care
- **Strong science and technology**, e.g.,
  - Information technology interoperability and use for better care and evidence
  - Data sharing, curation, and use for a continuously learning health system
  - Training the workforce for 21st century science

“ We must adjust to changing times,

and

still hold to unchanging principles”

Jimmy Carter

The Journey Continues

Thank you

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