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Patient Centric Real World Data & Evidence Generation

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Transforming evidence generation



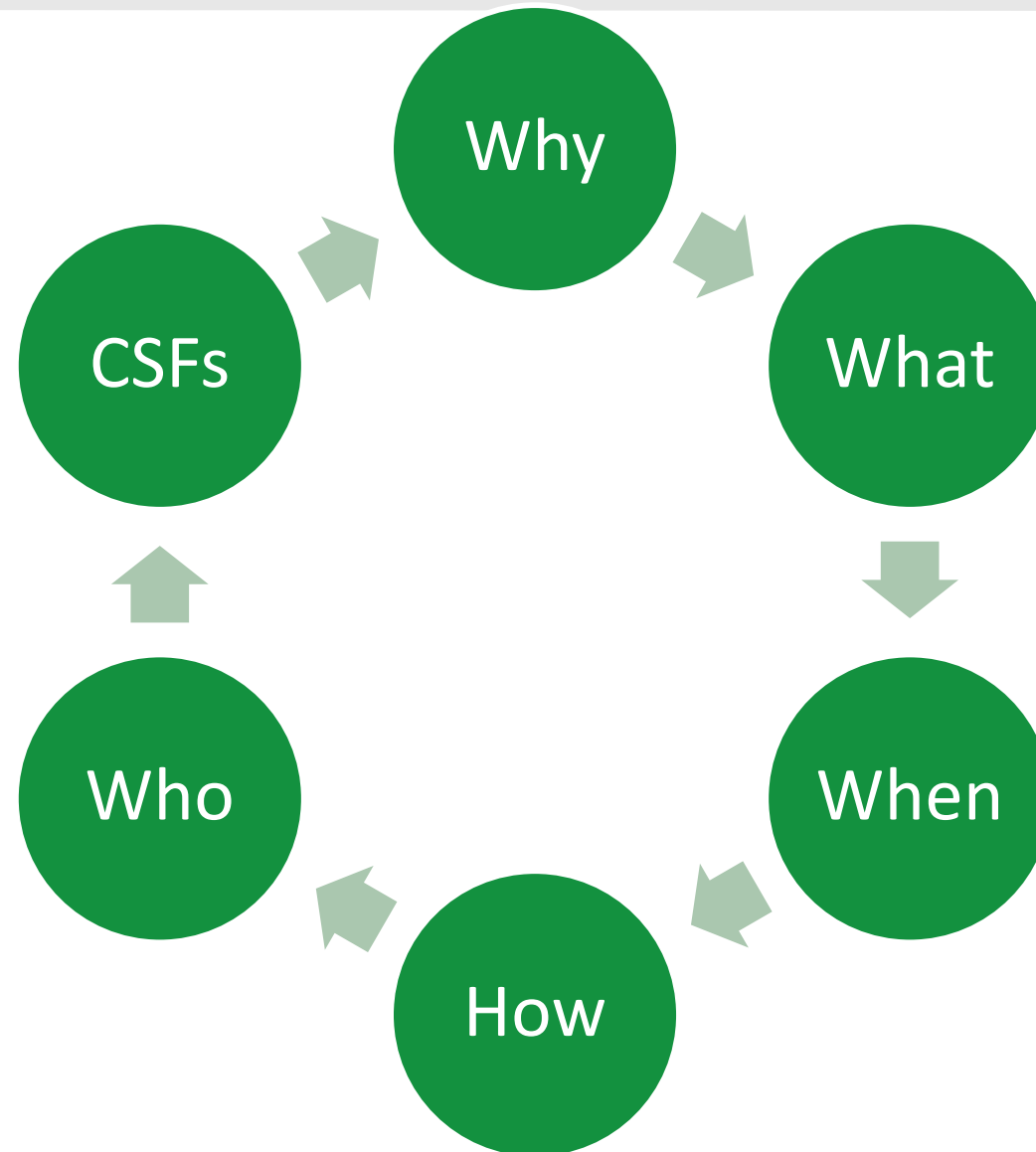
- Making the best possible choices about health care requires the best possible evidence upon which to base these important decisions.
- High quality evidence comes from many sources including real world data (RWD).
- The sources of RWD are numerous including electronic health records,, claims and billing data, product and disease registries and patient-reported data.
- Analysis of RWD leads to clinical evidence known as real world evidence (RWE) regarding the usage and risks and benefits of a therapy.
- Under the right conditions, RWD and the RWE that follows may be used to support regulatory decisions and contribute to the knowledge of a drug or therapy.
- RWE may help to support improved decision-making about health and health care.

Learning objectives

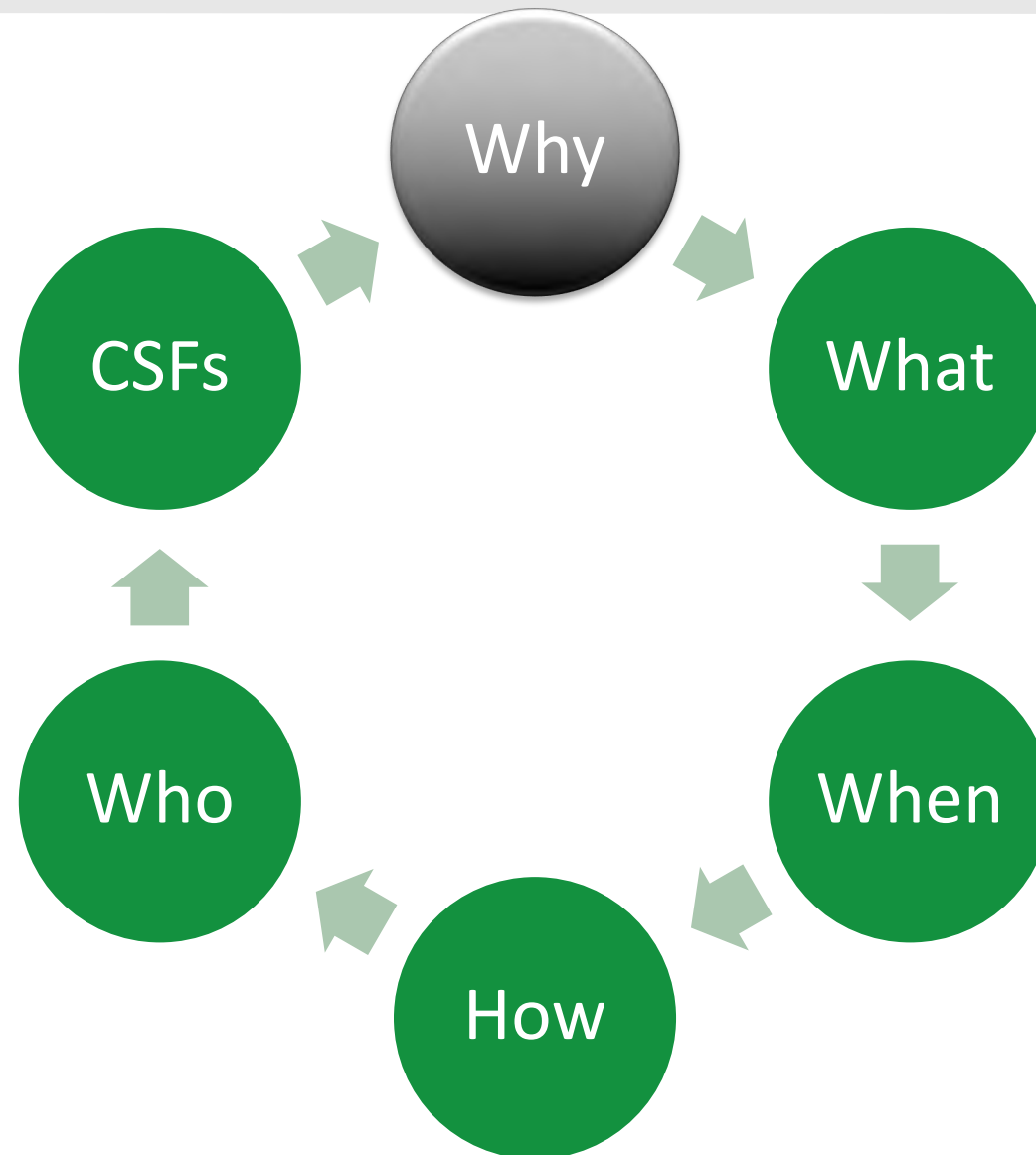
After completing this program, the participant will be able to:

1. List the sources of real world data (RWD),
2. Understand how real world evidence (RWE) can help to support a regulatory decision,
3. Recognize when in the product life cycle RWD/RWE may be useful,
4. Utilize a patient-centric framework to develop a RWD/RWE generation plan.

Outline for the presentation



Outline for the presentation



Why

Long-term outlook for the U.S. economy and budget



- Two major drivers of spending:
 - America's demographics and
 - Rising healthcare costs.

<https://www.pgpf.org/the-fiscal-and-economic-challenge/drivers>

Why

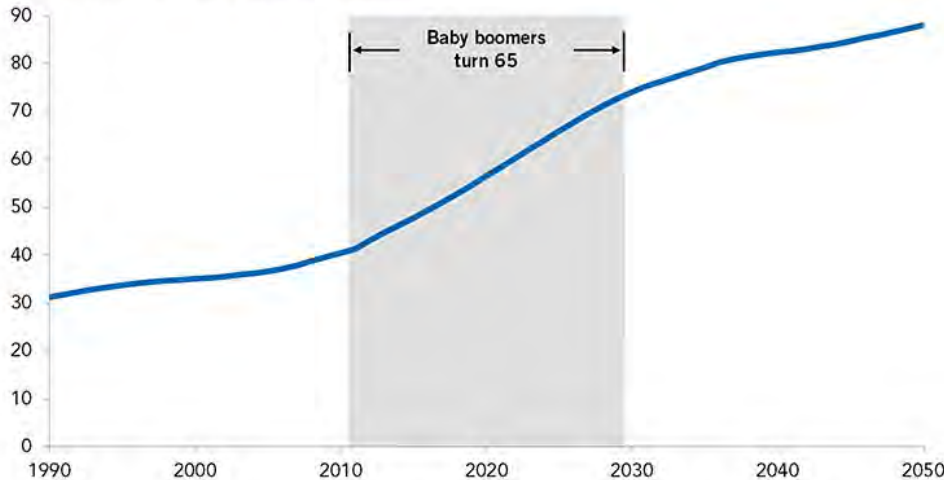
Long-term outlook for the U.S. economy and budget

- Two major drivers of spending:
 - **America's demographics**
 - Rising healthcare costs.



The aging of the baby boom generation will boost the number of Americans age 65 and older

Number of People Age 65 and Older (Millions)



SOURCE: U.S. Census Bureau, *National Intercensal Estimates and 2014 National Population Projections*, December 2014. Compiled by PGPF.
NOTE: The highlighted period represents the time span between the years when the oldest and when the youngest of the baby boom generation turn age 65.

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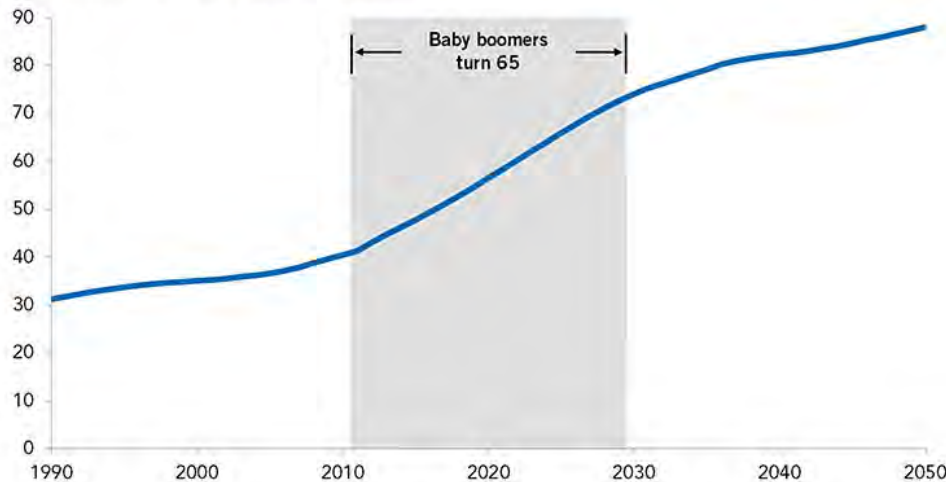
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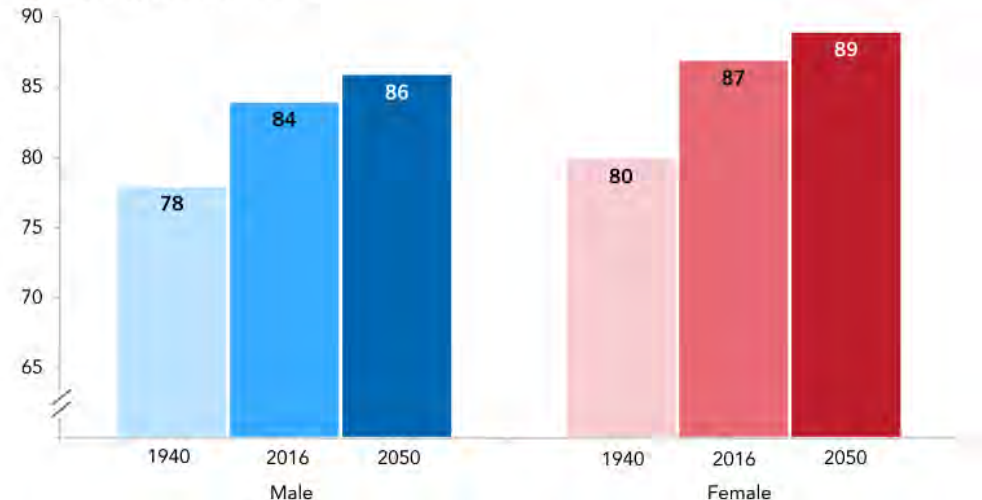
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Life expectancy continues to improve for the elderly

LIFE EXPECTANCY AT AGE 65



SOURCE: Social Security Administration, *The 2016 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*, June 2016. Compiled by PGPF.

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Why

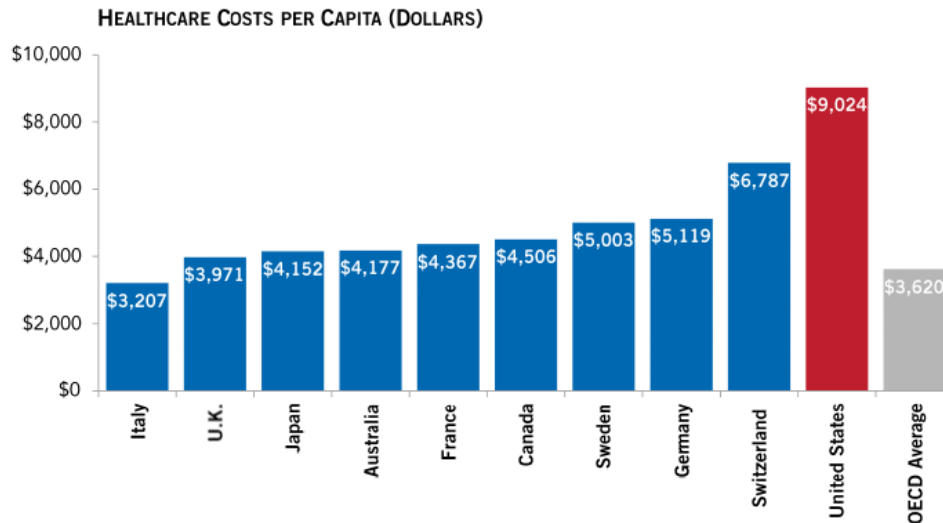
Long-term outlook for the U.S. economy and budget



- Two major drivers of spending:
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United States per capita healthcare spending is more than twice the average of other developed countries



SOURCE: Organization for Economic Cooperation and Development, OECD Health Statistics 2016, June 2016. Compiled by PGPF.
NOTE: Data are for 2014 or latest available. Chart uses purchasing power parities to convert data into U.S. dollars.

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Why

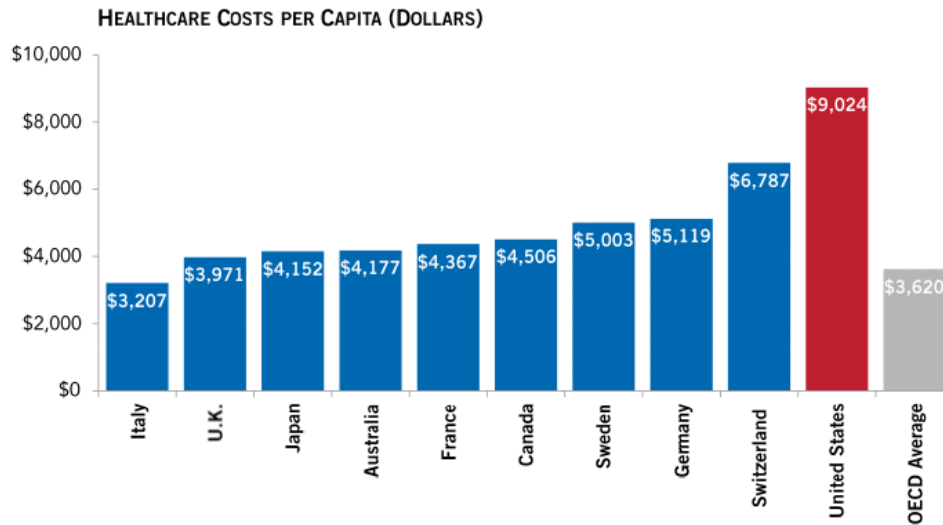
Long-term outlook for the U.S. economy and budget



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Although the United States spends more on healthcare than other developed countries, its health outcomes are generally no better



SOURCE: Organization for Economic Cooperation and Development, Health at a Glance 2015 OECD Indicators, November 2015. Compiled by PGPF.
NOTE: Data are not available for all countries for all metrics; all published data are shown. Data are for 2013 or latest available.

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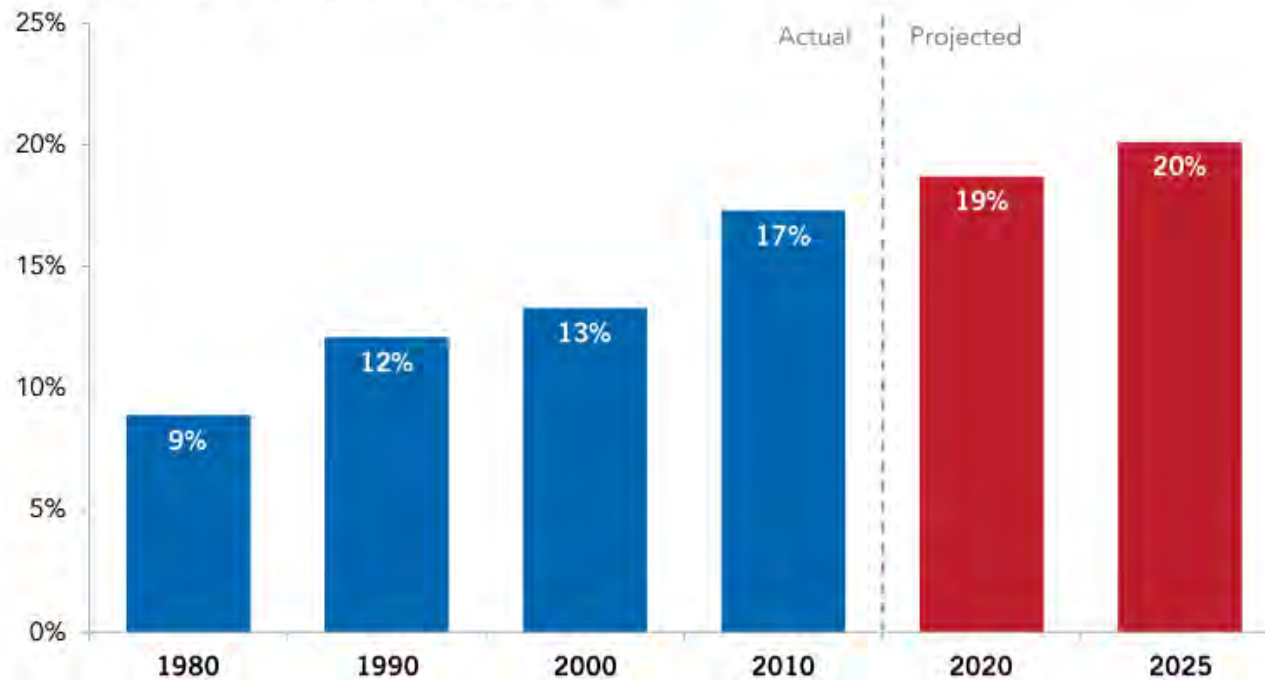
Why

Long-term outlook for the U.S. economy and budget



Total U.S. health spending (both public and private) is projected to rise to one-fifth of the economy by 2025

NATIONAL HEALTH EXPENDITURES (% OF GDP)



SOURCE: Centers for Medicare and Medicaid Services, *National Health Expenditures*, July 2016. Compiled by PGPF.

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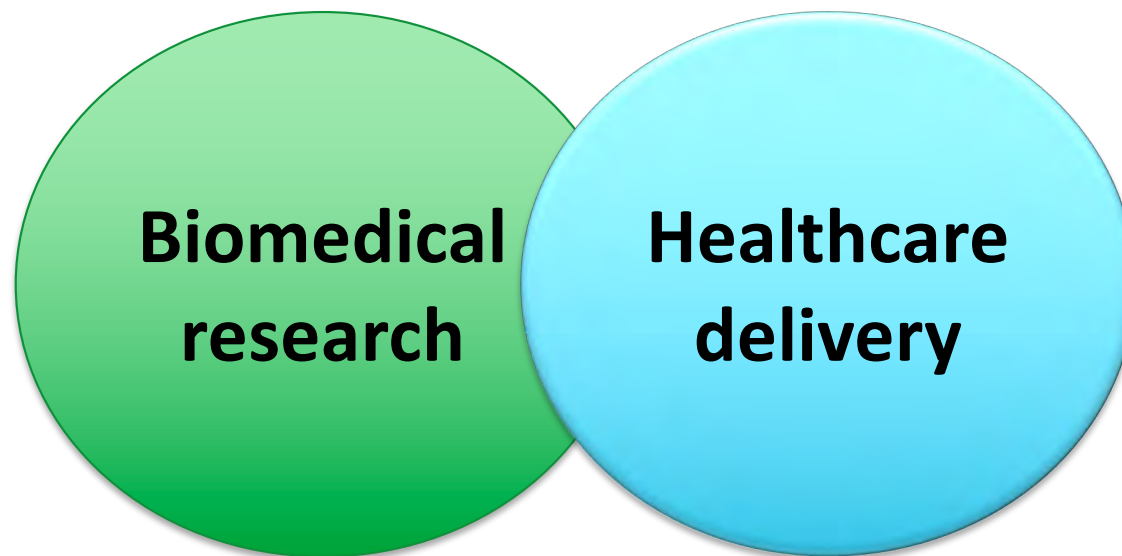
- **The past:** Biomedical research and health care delivery are viewed as and operate independently.

**Biomedical
research**

**Healthcare
delivery**

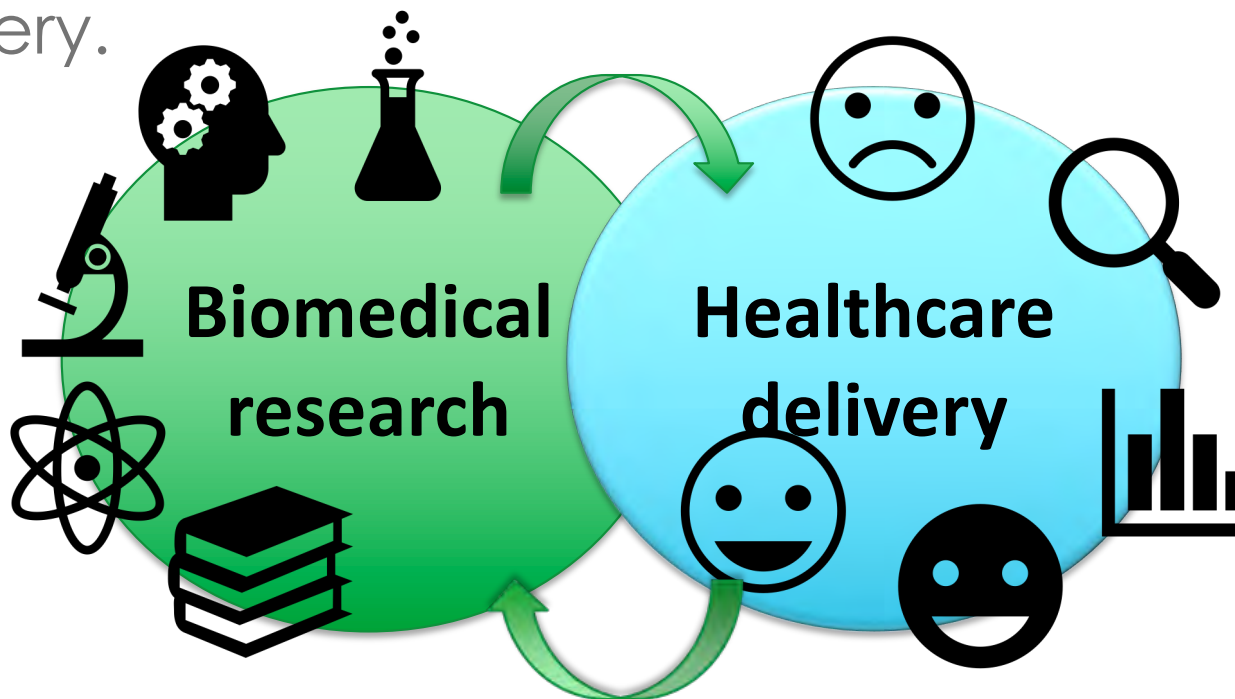
Strategy to improve health outcomes

- **The future:** Federal agencies are seeking unprecedented collaborations among agencies involved in biomedical research and health care delivery.



Strategy to improve health outcomes

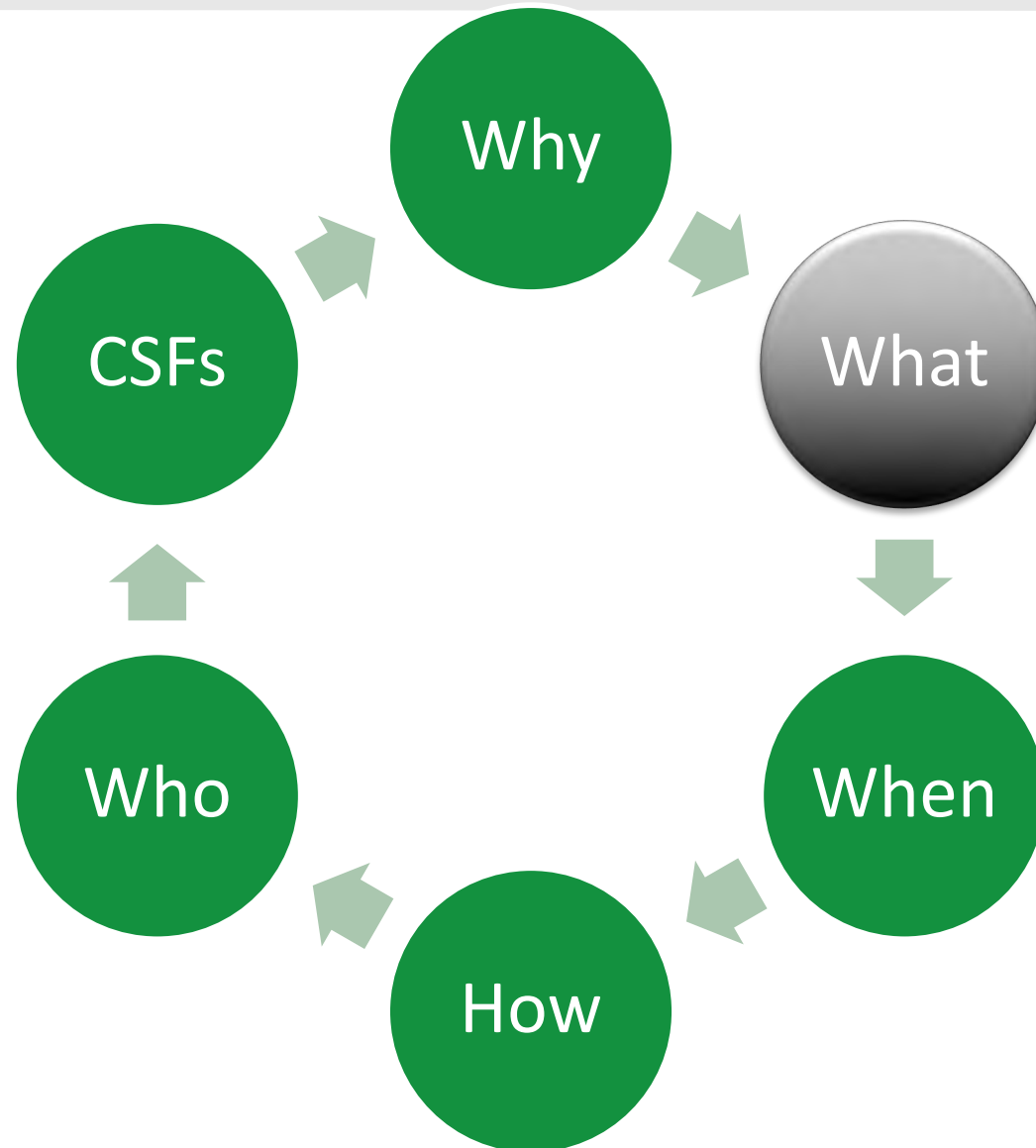
- **The future:** Federal agencies are seeking unprecedented collaborations among agencies involved in biomedical research and health care delivery.



Strategies to improve health outcomes

- Faster drug approvals using new classes of evidence and adaptive frameworks
- Communicating among stakeholders around health care economic information
- Advancing medical device innovation
- Improved health outcomes and more efficient health care system
- Slowing growth of healthcare expenditures

Outline for the presentation



New classes of evidence

- Real World Data (RWD) is defined as data relating to patient health status and/or the delivery of health care routinely collected from a variety of sources.
- Real World Evidence (RWE) is defined as clinical evidence regarding the use and potential benefits or risks of a drug derived from analysis of RWD.

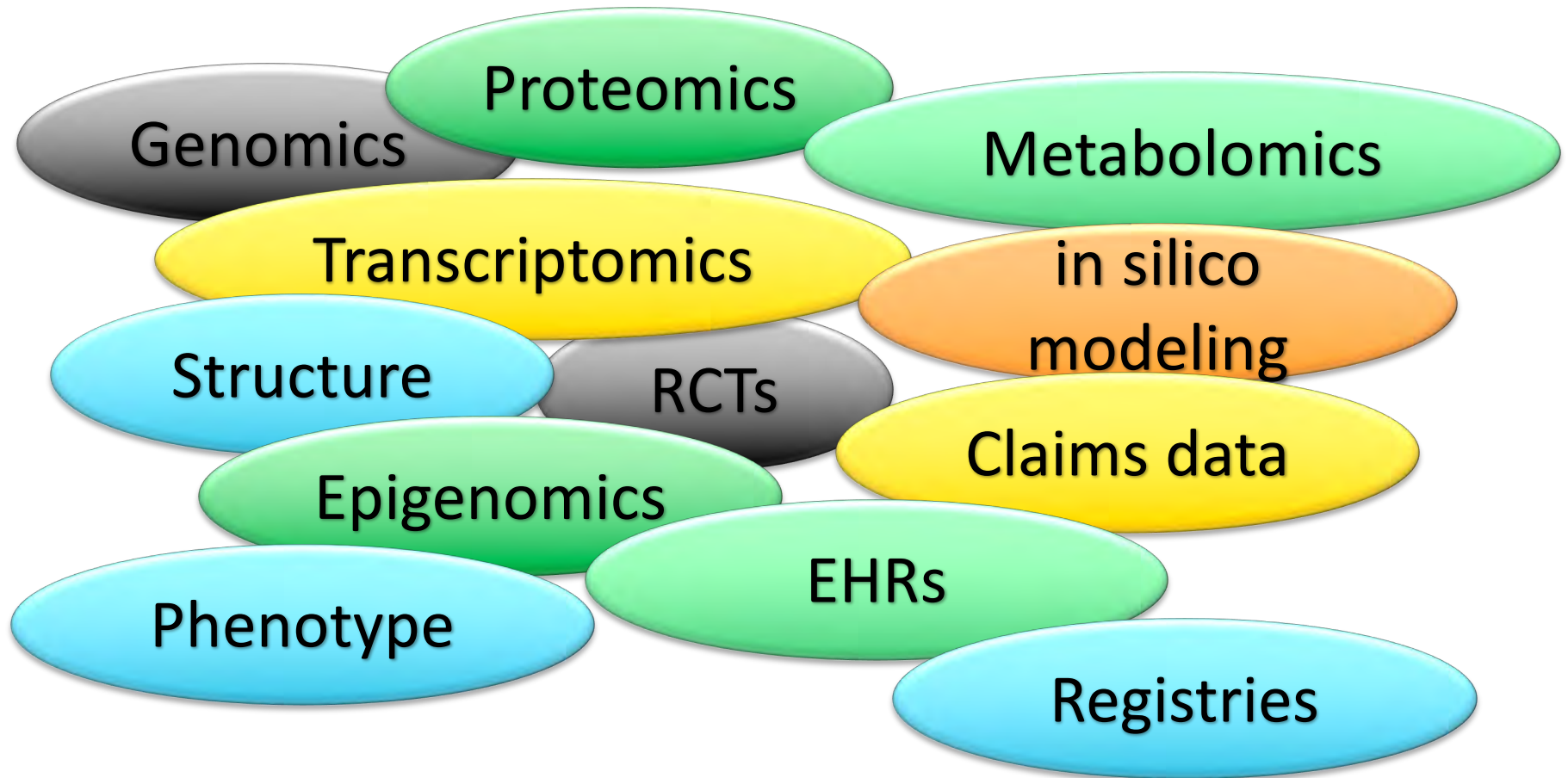
21st Century Cures Act

- Signed into law on December 13, 2016 by President Obama.
- The Act promotes and funds the acceleration of research into preventing and curing serious illnesses.
- It also is designed to accelerate drug and medical device development.



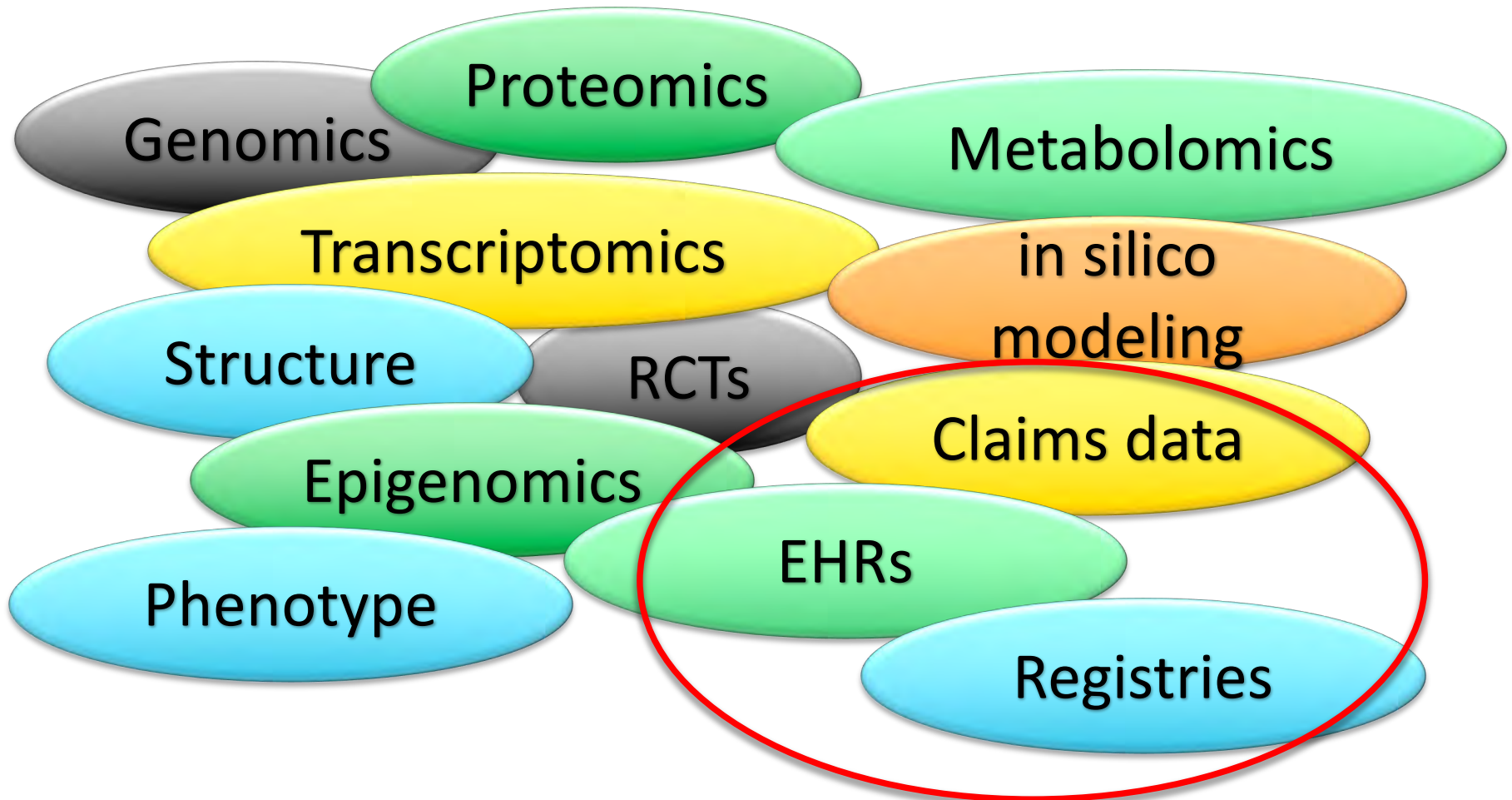
What

What data?



What

What data?



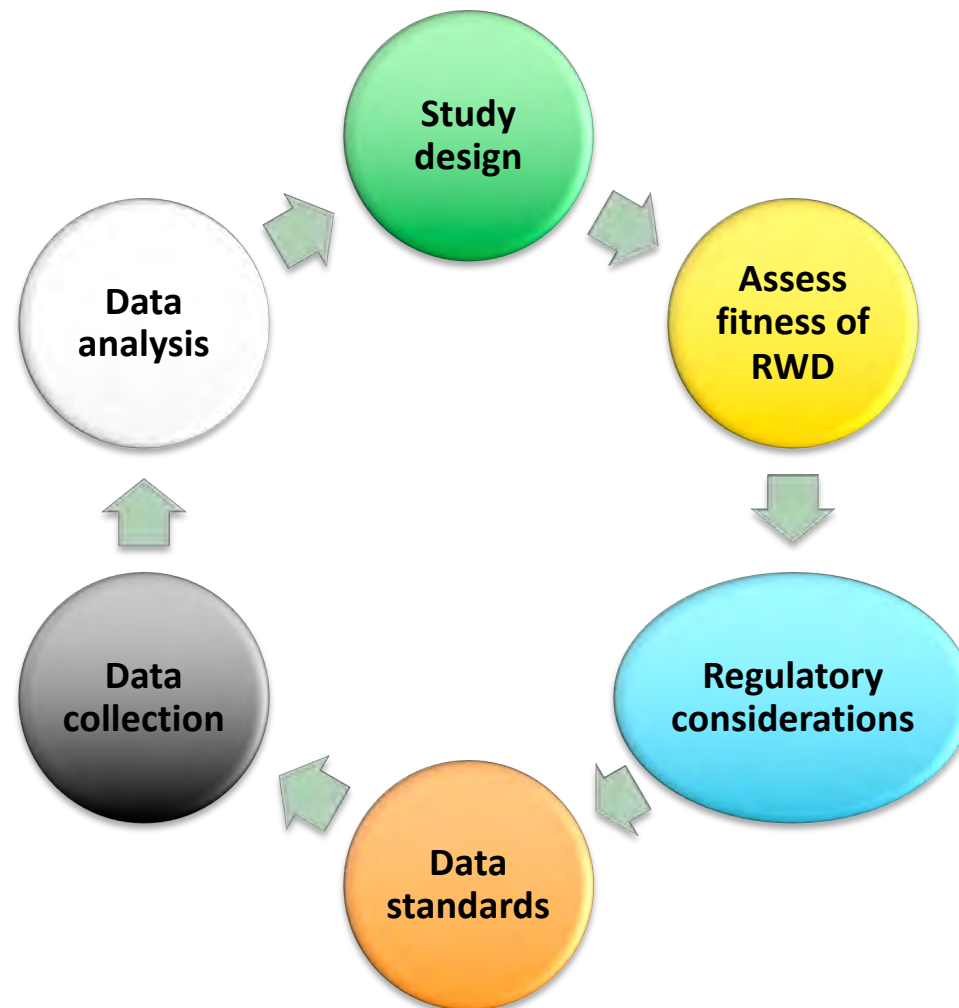
RWD is any data collected outside of the constraints of conventional randomized clinical trials

The Sentinel Distributed Database (SDD)



- 66.9 million members currently accruing new data
- 292.5 million cumulative patient identifiers between 2000 and 2017
- 14.4 billion pharmacy dispensing records
- 13.3 billion unique medical encounters
- 45.6 million members with at least one laboratory test result

Turning RWD into RWE



Clinical Trials of RWD

- 28 February 2018
 - “Real world data” search of www.clinicaltrials.gov
 - 307 studies
 - 92 studies recruiting
 - 19 studies completed with data
 - A retrospective study of real world treatment outcomes of patients with chronic hepatitis C (NCT01705717)
 - » First posted 12 October 2012
 - » Results first posted 12 January 2015
 - » 49 patient observational study
 - » Retrospective survey of medical records of patients with chronic hepatitis C
 - **Percentage of Participants Who Progressed From CHC to Hepatocellular Carcinoma (HCC) at 36 months**

What

A retrospective study of real world treatment outcomes of patients with chronic hepatitis C



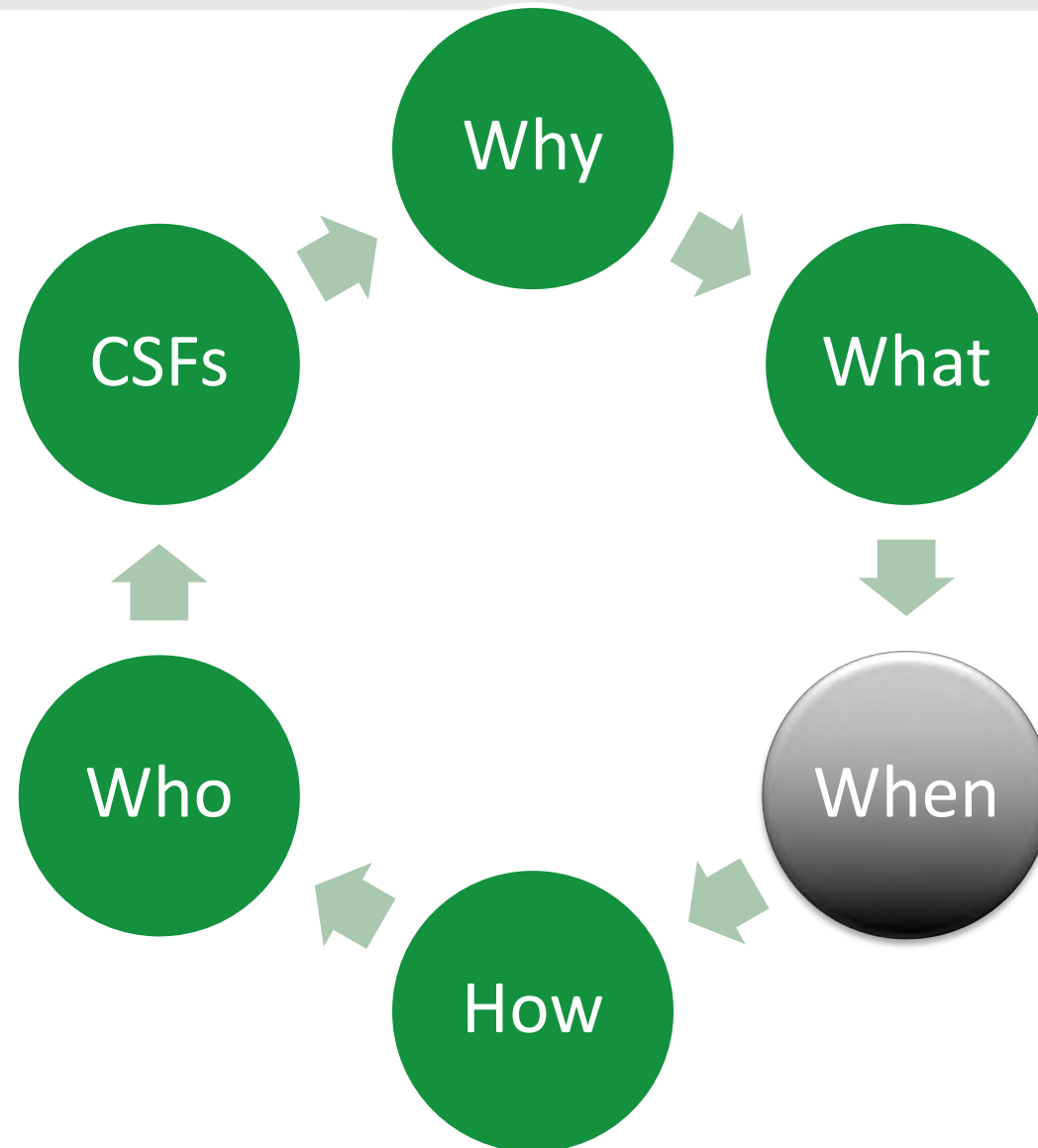
	Non-Cirrhotic CHC Observation Only	HCV – Related Cirrhosis Observation Only
Participants Analyzed [Units: Participants]	37	12
Percentage of Participants Who Progressed From CHC to Hepatocellular Carcinoma (HCC) [Units: Percentage of participants]	2.7	8.3

Sponsor: Hoffmann-La Roche

P= 0.007

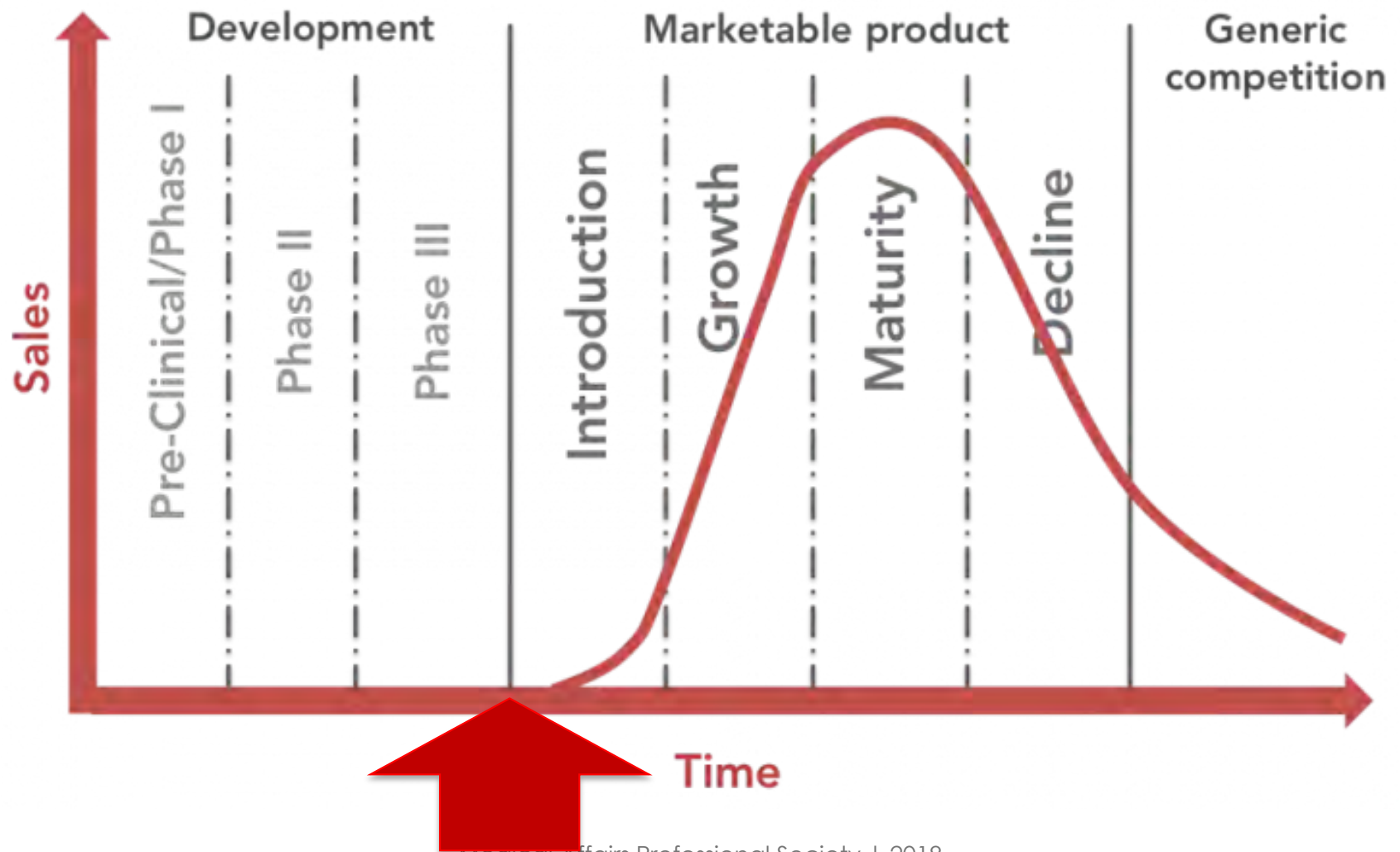
<https://clinicaltrials.gov/ct2/show/NCT01705717?term=NCT01705717&rank=1>

Outline for the presentation



When

When in the product life cycle?



When

When in the product life cycle?

Development

Natural history

SoC

Unmet need

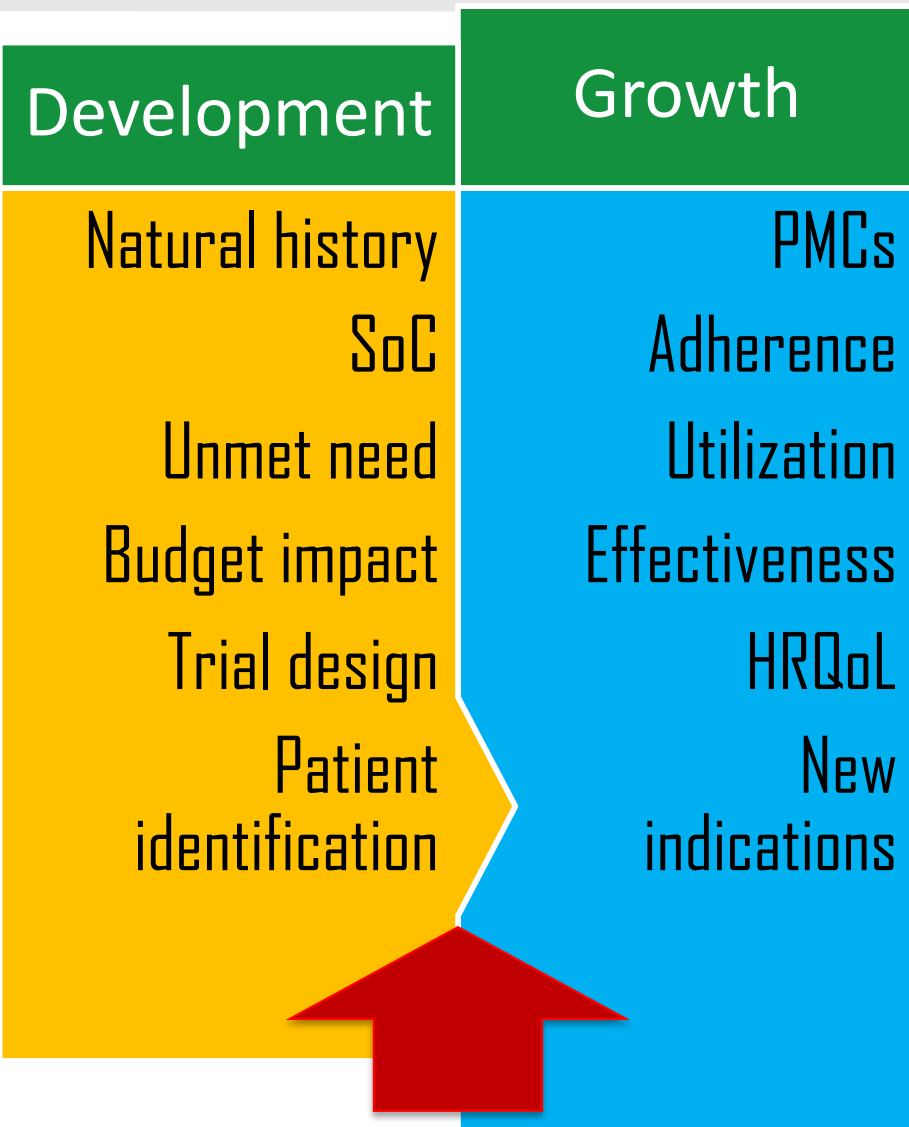
Budget impact

Trial design

Patient
identification

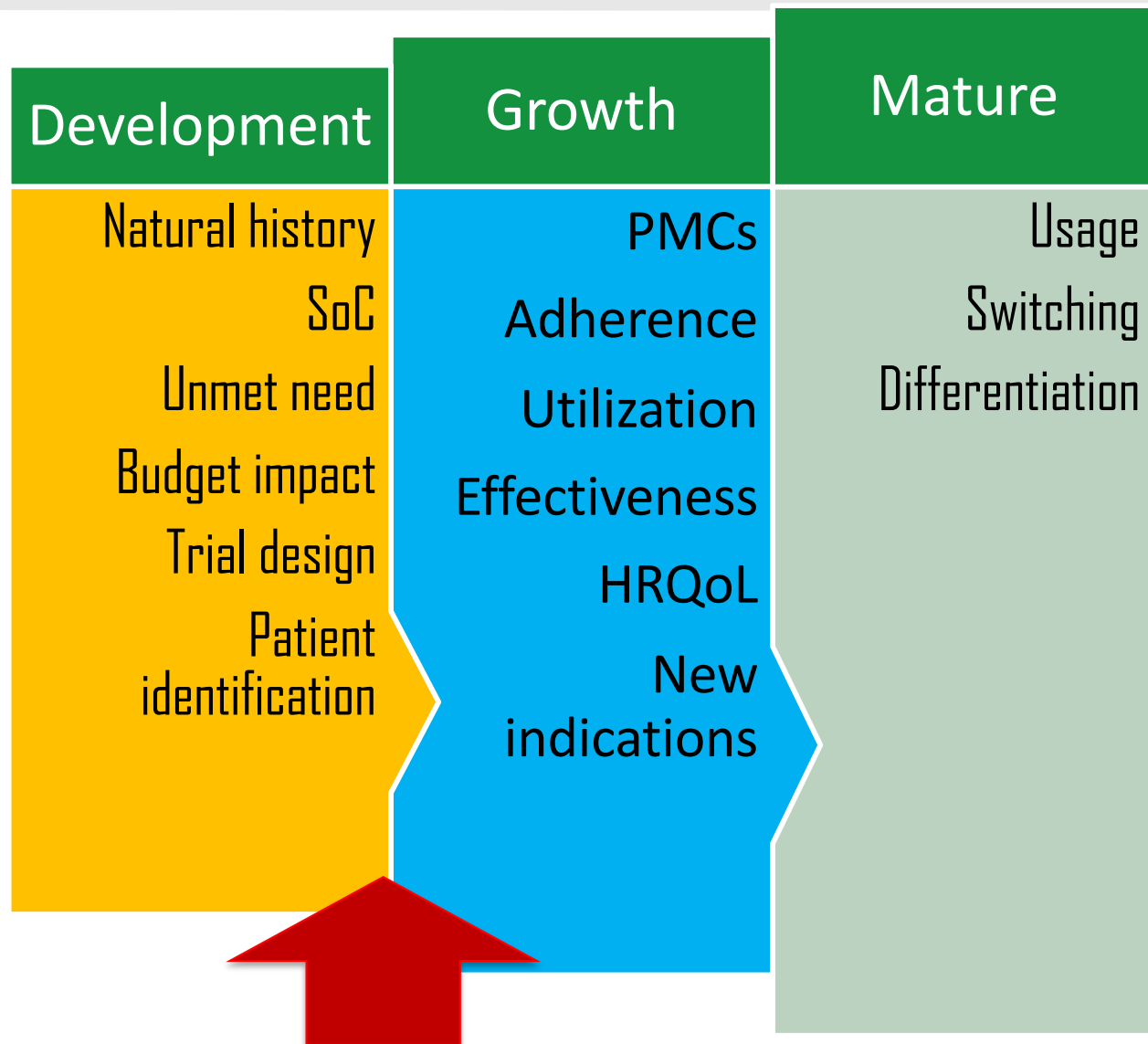
When

When in the product life cycle?



When

When in the product life cycle?



When

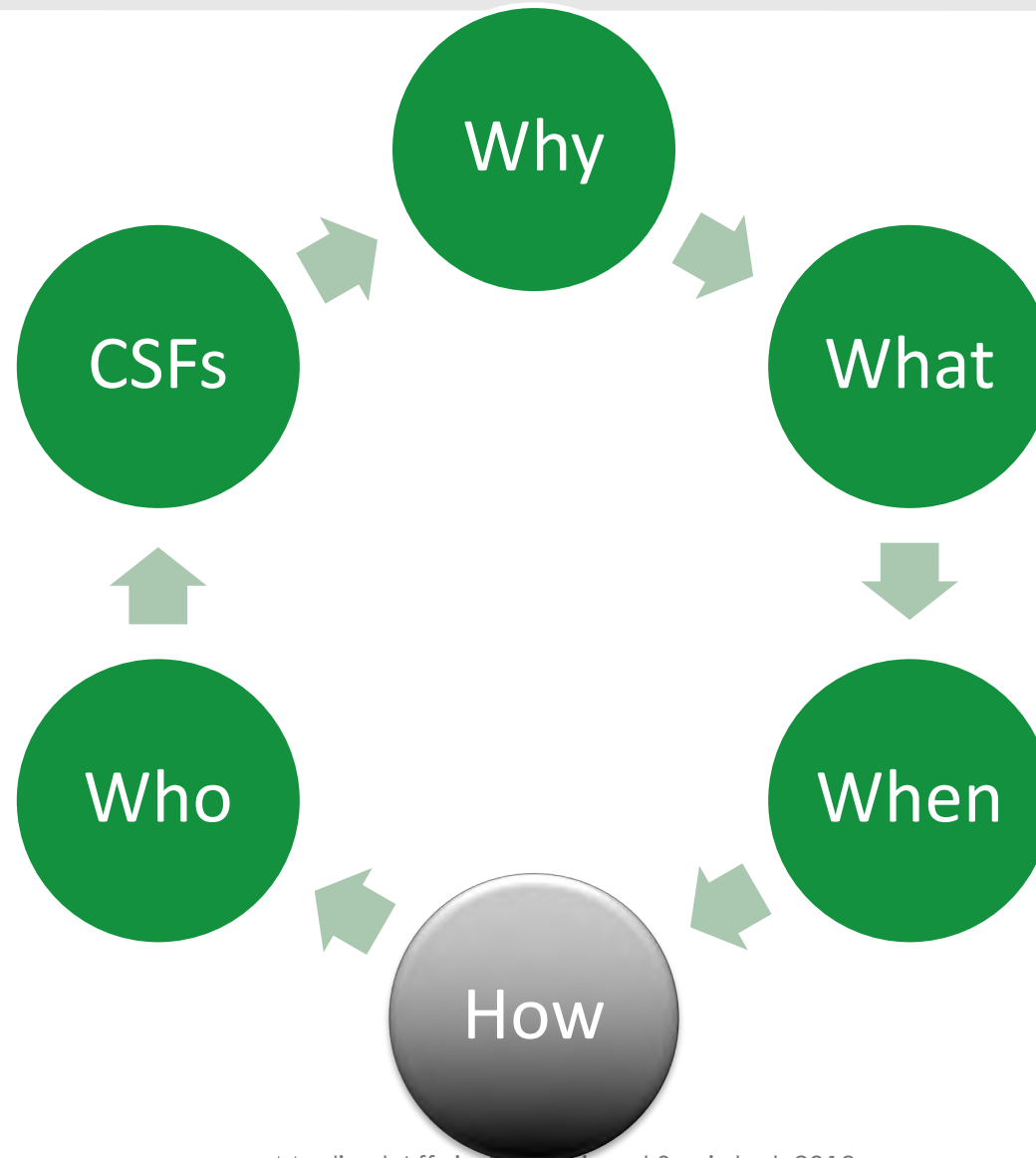
Examples where RWE is used

Use of Real-World Evidence to Support Regulatory Decision-Making for Medical Devices

- Expanded indications for use
- Post marketing surveillance studies
- Post approval device surveillance of a condition of approval
- Control group
- Supplementary data
- Objective performance criteria and performance goals

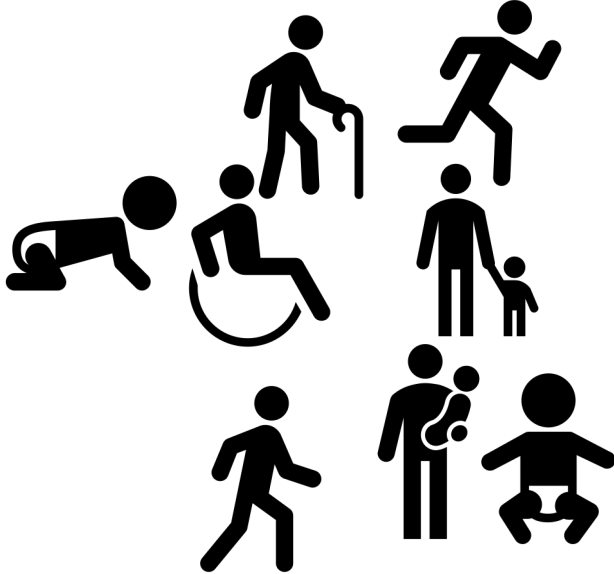
US FDA

Outline for the presentation



How

Patient-centered approach



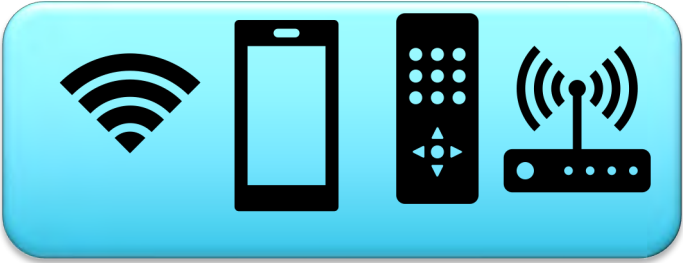
How

Patient-centered approach



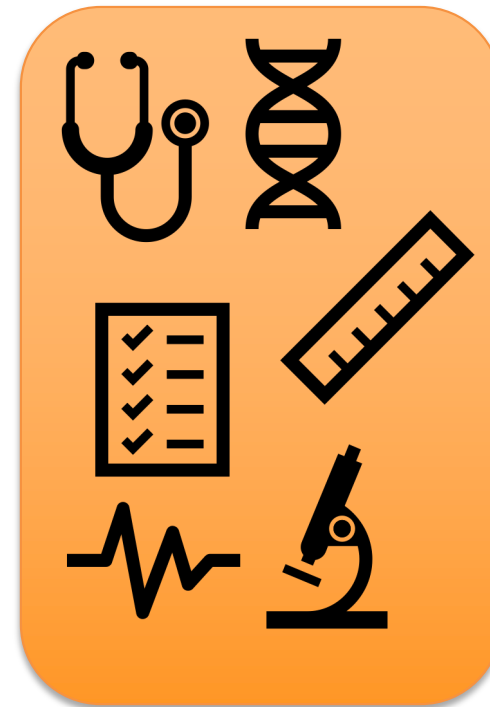
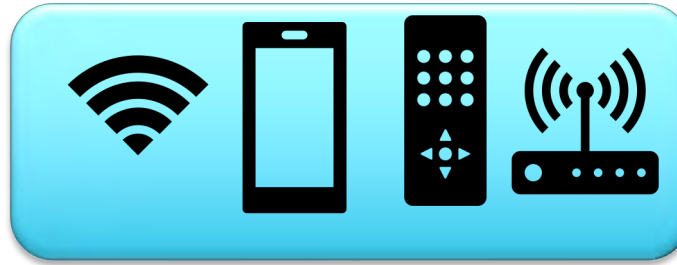
How

Patient-centered approach



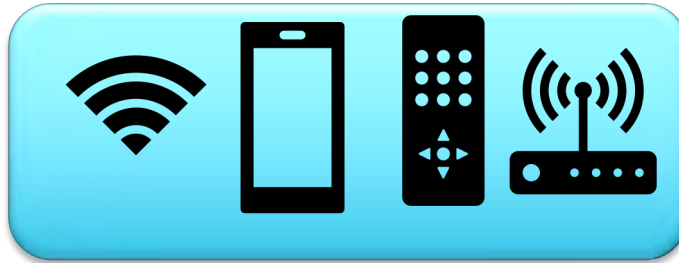
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Patient-centered approach



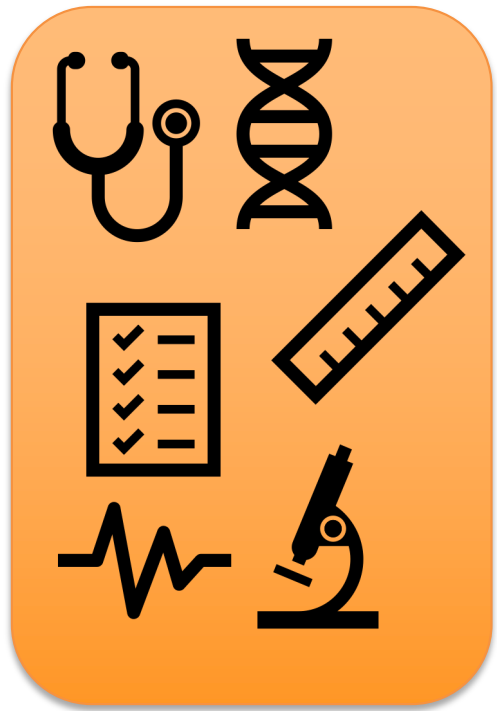
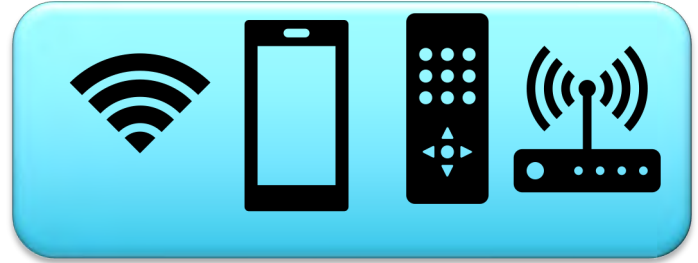
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Patient-centered approach



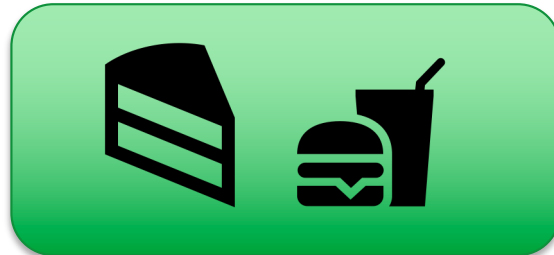
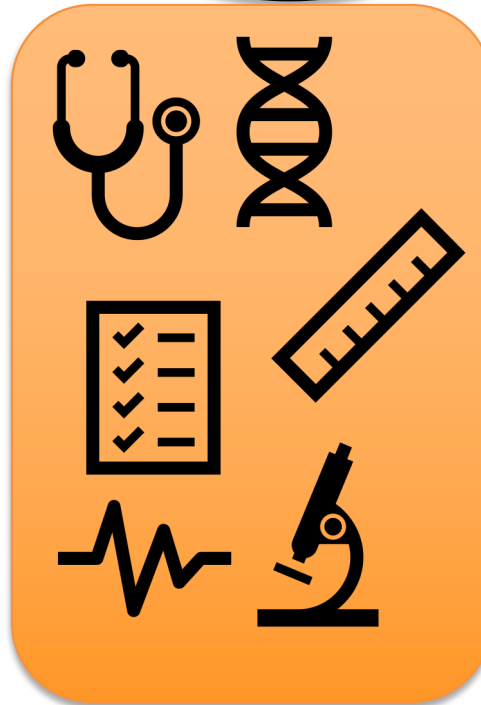
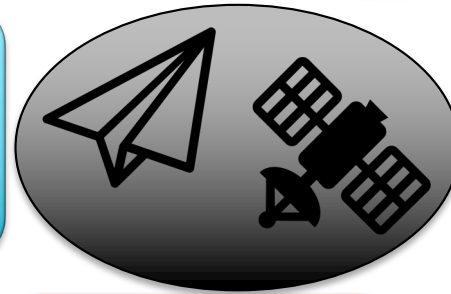
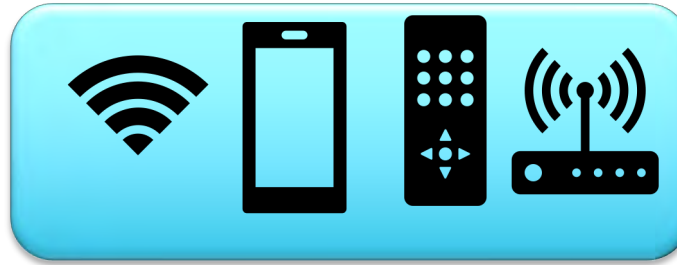
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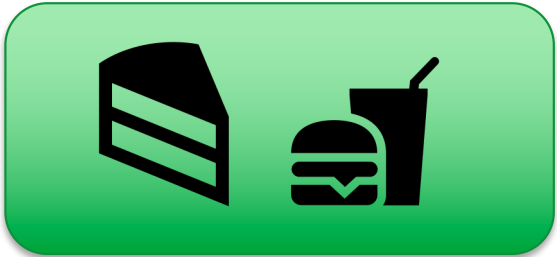
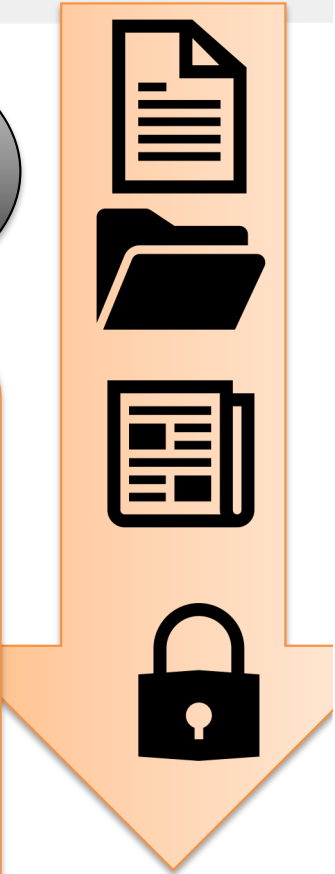
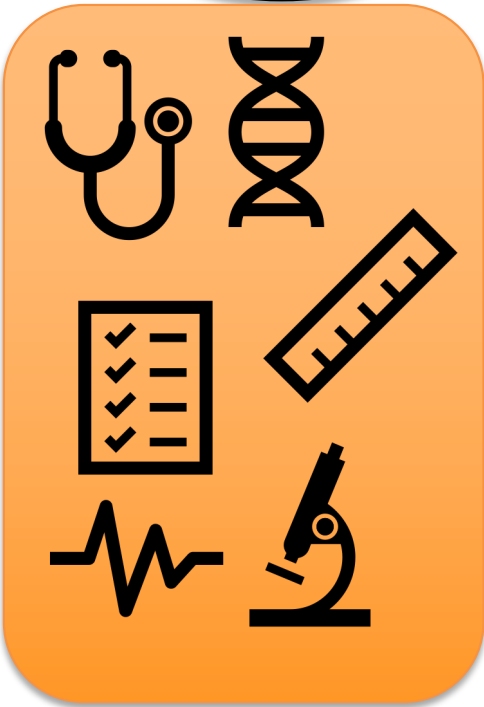
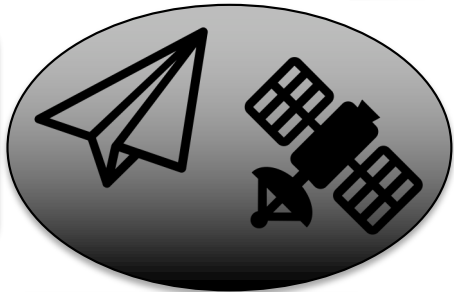
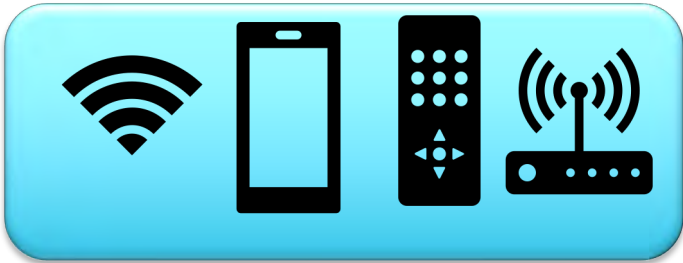
How

Patient-centered approach



How

Patient-centered approach



How

Patient-centered approach



- Registry data

- Describe the natural history of a disease
- Examine the clinical effectiveness of current therapies
- Determine the medical and clinical gaps in care
- Assess safety of current SoC therapy
- Assess quality of current SoC

Development

Sources of RWD

- Registry data

- Describe the natural history of a disease
- Examine the clinical effectiveness of current therapies
- Determine the medical and clinical gaps in care
- Assess safety of current SoC therapy
- Assess quality of current SoC
- Analysis of product safety
- Measure effectiveness/efficacy
- Assess safety in populations at risk (e.g., children, pregnancy, elderly)

Growth

Sources of RWD

- Registry data

- Describe the natural history of a disease
- Examine the clinical effectiveness of current therapies
- Determine the medical and clinical gaps in care
- Assess safety of current SoC therapy
- Assess quality of current SoC

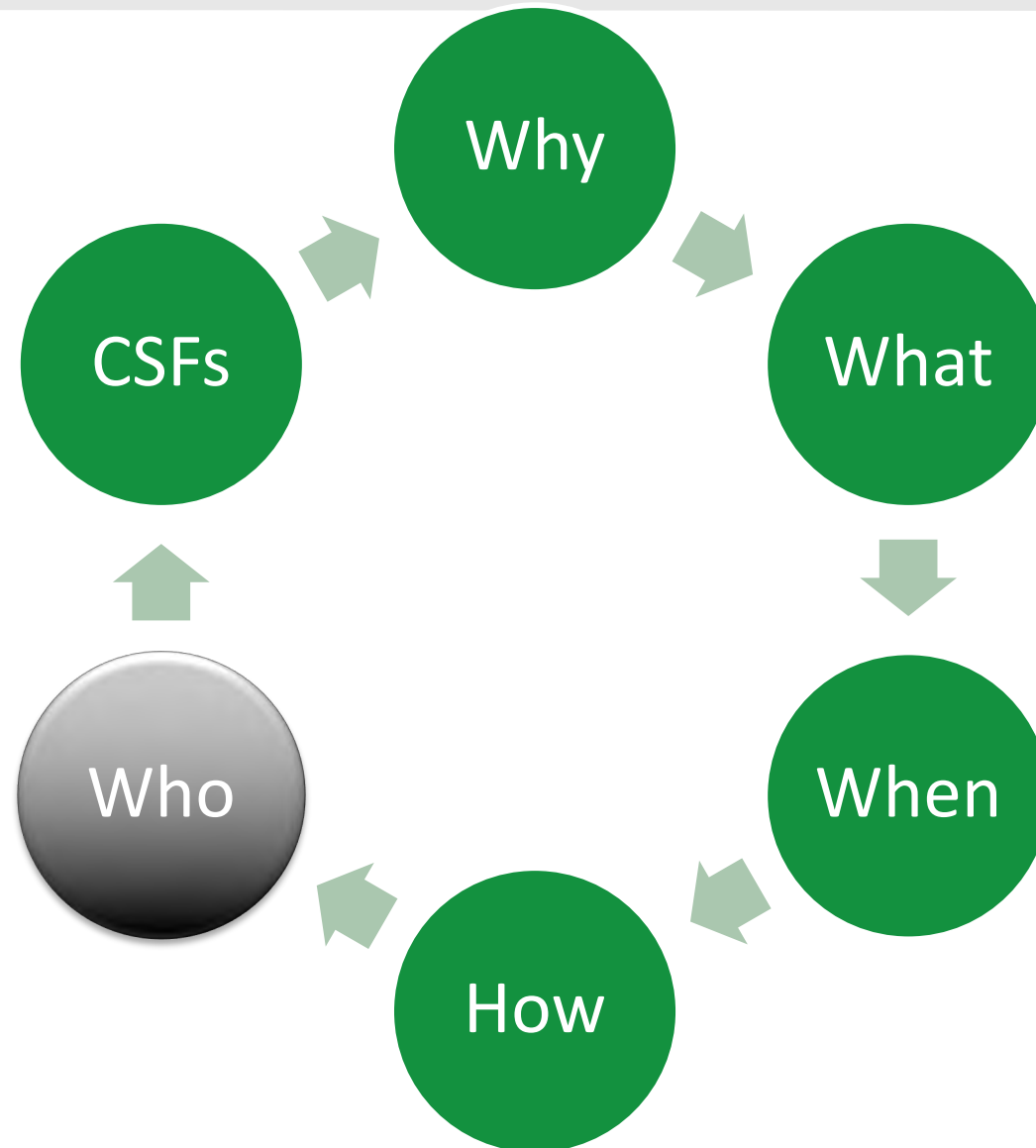
- Analysis of product safety
- Measure effectiveness/efficacy
- Assess safety in populations at risk (e.g., children, pregnancy, elderly)

- Quality of life
- Resource utilization

Mature

- Problems with registry data
 - Recruitment
 - Data quality
 - Individual product registries
 - Lack sustainability due to financial stability
 - Clarity of data ownership and publication rights
 - Data access

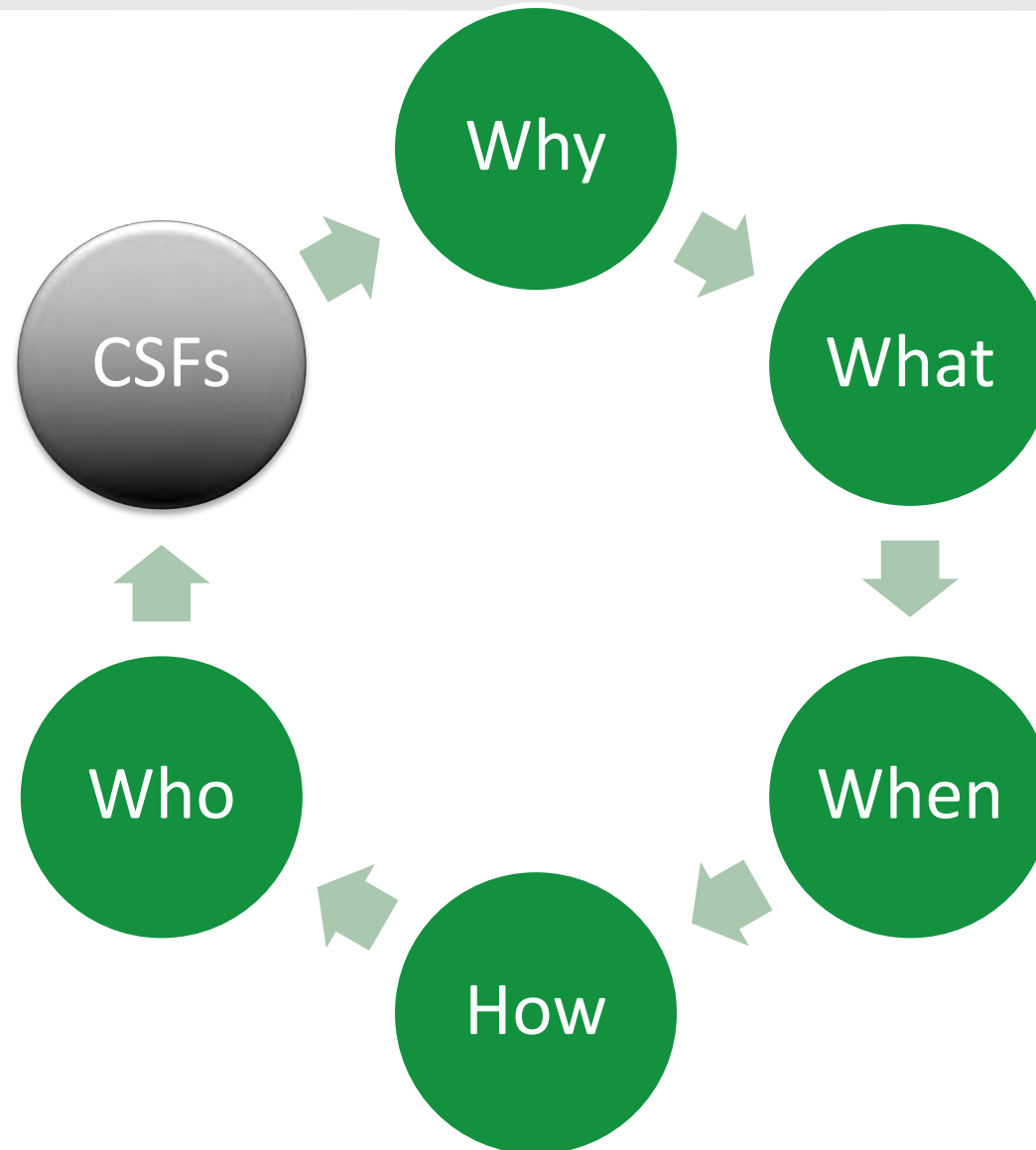
Outline for the presentation



Who are the stakeholders?

- EMA Workshop on Patient Registries
 - Registry owners
 - Pharma/biotech
 - HTA representatives
 - Regulators and patients
- Goal of workshop
 - Identify solutions to better use current registries
 - Collect high quality data from the use of medicines in clinical practice
- Output
 - Recommendations for tools and standards

Outline for the presentation



What are the critical success factors to enhance RWD?

- Guidance on standardized data collection
- Recoding of medicines information, response to treatment, changes in disease state, etc.
- Flexibility and capacity to accommodate methodological differences across multiple studies
- Defined points of contact
- Establish governance to allow data access and sharing
- Provide feedback to HCPs and registry participants

What are the critical success factors to enhance RWD?

- Sustainable funding
- Establish a common infrastructure/platform
- Adopt and utilize consistent ontologies
- Adopt and utilize common data elements
- Establish data management principles
- Enhance bioinformatics and statistical support
- Collaboration among all stakeholders

Summary of the presentation

