Disclaimer: the opinions expressed during the Webinar are those of the presenters only, and do not necessarily reflect the opinions of MAPS nor the presenters’ employers.
Patient Centric Real World Data & Evidence Generation

Leonard A. Valentino, M.D.
Rush University
Chicago, IL U.S.A.

Spark Therapeutics
Philadelphia, PA U.S.A.

March 16, 2018
• 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

Why

What

When

How

Who

CSFs
Outline for the presentation

Why

CSFs

What

Who

When

How

Medical Affairs Professional Society | 2018
Long-term outlook for the U.S. economy and budget

• Two major drivers of spending:
  – America’s demographics and
  – Rising healthcare costs.

Why

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

• Two major drivers of spending:
  – America’s demographics
  – Rising healthcare costs.

Why

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

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

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

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

United States per capita healthcare spending is more than twice the average of other developed countries

NOTE: Data are for 2014 or latest available. Chart uses purchasing power parities to convert data into U.S. dollars.

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

• Two major drivers of spending:
  – America’s demographics and
  – Rising healthcare costs.

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

Why

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)


9% 12% 13% 17% 19% 20%

SOURCE: Centers for Medicare and Medicaid Services, National Health Expenditures, July 2016. Compiled by PGPF.
© 2016 Peter G. Peterson Foundation

Strategy to improve health outcomes

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

Strategy to improve health outcomes

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

- Why
- What
- When
- How
- CSFs

Medical Affairs Professional Society | 2018
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 Cares 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 data?

- Genomics
- Transcriptomics
- Proteomics
- Metabolomics
- in silico modeling
- Structure
- RCTs
- Claims data
- Epigenomics
- Phenotype
- EHRs
- Registries
What data?

- Genomics
- Transcriptomics
- Proteomics
- Metabolomics
- in silico modeling
- Structure
- RCTs
- Epigenomics
- Claims data
- Phenotype
- EHRs
- Registries

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

What

- Data standards
- Data collection
- Study design
- Assess fitness of RWD
- Regulatory considerations

Medical Affairs Professional Society | 2018
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
# A retrospective study of real world treatment outcomes of patients with chronic hepatitis C

<table>
<thead>
<tr>
<th></th>
<th>Non-Cirrhotic CHC Observation Only</th>
<th>HCV – Related Cirrhosis Observation Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants Analyzed</td>
<td>37</td>
<td>12</td>
</tr>
<tr>
<td>[Units: Participants]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of Participants Who</td>
<td>2.7</td>
<td>8.3</td>
</tr>
<tr>
<td>Progressed From CHC to Hepato</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cellular Carcinoma (HCC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Units: Percentage of participants]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sponsor: Hoffmann-La Roche

P = 0.007

Outline for the presentation

- Why
- What
- When
- How
- CSFs

Medical Affairs Professional Society | 2018
When in the product life cycle?
When in the product life cycle?

- Natural history
- SoC
- Unmet need
- Budget impact
- Trial design
- Patient identification
When in the product life cycle?

Development
- Natural history
- SoC
- Unmet need
- Budget impact
- Trial design
- Patient identification

Growth
- PMCs
- Adherence
- Utilization
- Effectiveness
- HRQoL
- New indications

When
When in the product life cycle?

<table>
<thead>
<tr>
<th>Development</th>
<th>Growth</th>
<th>Mature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural history</td>
<td>PMCs</td>
<td>Usage</td>
</tr>
<tr>
<td>SoC</td>
<td>Adherence</td>
<td>Switching</td>
</tr>
<tr>
<td>Unmet need</td>
<td>Utilization</td>
<td>Differentiation</td>
</tr>
<tr>
<td>Budget impact</td>
<td>Effectiveness</td>
<td></td>
</tr>
<tr>
<td>Trial design</td>
<td>HRQoL</td>
<td></td>
</tr>
<tr>
<td>Patient identification</td>
<td>New indications</td>
<td></td>
</tr>
</tbody>
</table>
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

- Why
- CSFs
- What
- Who
- When
- How
Patient-centered approach
How

Patient-centered approach
Patient-centered approach

How
Patient-centered approach
Patient-centered approach

How
Patient-centered approach

How
Patient-centered approach
Patient-centered approach
Patient-centered approach

How

Medical Affairs Professional Society | 2018
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

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)
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
Sources of RWD

• 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

Why

What

When

How

CSFs

Who
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

- Why
- What
- When
- How
- Who

CSFs
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

Why

CSFs

What

Who

When

How