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Streamlining Academic Research Through Meta-Analysis Enhanced by CDISC Standards Integration

Presented by Yen Phan, Founder and Sr. Clinical Data Scientist, CodLad

Meet the Speaker

Yen Phan

Title: Founder and Sr Clinical Data Scientist

Organization: CodLad/University of Oxford

Yen Phan is a founder of CodLad and a Senior Data Scientist with over 10 years of experience in the industry. She has also been lecturing at Technological University Dublin, Ireland for 8 years on Pharma Science and Evidence based healthcare. At the same time, she is finalizing her dissertation at University of Oxford with a focus of a meta-analysis. She has been actively involved in CDISC standard implementation, she has given a speak at CDISC TMF Interchange in USA and she is on the Conference Co-ordinating Committee in the upcoming CDISC Interchange in Berlin 2024.

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Agenda

1. The importance of CDISC standards in academic research
2. Meta-Analysis in Academic Research and its challenges
3. Enhancing Meta-Analysis with CDISC Standards
4. Future of Research with CDISC

The importance of CDISC standards in academic research

Data harmonization and interoperability	• Provide a common framework for collecting, organizing, and sharing clinical research data
Improved data quality and consistency	• Define clear and consistent definitions for data elements, reducing the risk of errors and misinterpretations
Enhanced data sharing and collaboration	• Facilitate data sharing and collaboration among researchers
Streamlined data analysis and visualization	• Enable researchers to more easily analyze and visualize their data using a variety of software tools
Increased data reusability and repurposing	• Make data more reusable and repurposable for future research
Promotes regulatory compliance	• Can help researchers expedite regulatory approvals and bring their findings to patients more quickly

Meta-Analysis in Academic Research

- Meta-analysis is a statistical technique that combines the results of multiple studies to come up with a more comprehensive and reliable understanding of a research topic.
- It is a powerful tool for synthesizing research findings and drawing stronger conclusions than would be possible from any single study.

Steps in a Meta-analysis

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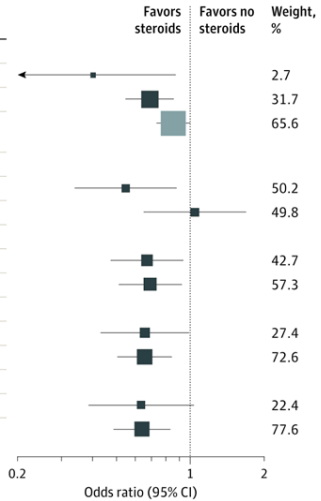
Role of Meta-analysis in Synthesizing Research Findings

- Provides a more precise estimate of the effect of an intervention or treatment
- Helps to identify and explain heterogeneity
- Can be used to identify subgroup effects
- Can be used to inform clinical practice and policy decisions

Example : Association Between Administration of Systemic Corticosteroids and Mortality Among Critically Ill Patients With COVID-19A Meta-analysis

- Conducted by WHO; it was published in JAMA in 2021.
- Prospective meta-analysis that pooled data from 7 RCTs that evaluated the efficacy of corticosteroids in 1703 critically ill patients with COVID-19

Subgroup	No. of deaths/total No. of patients: Steroids	No steroids	Odds ratio (95% CI)
Invasive mechanical ventilation (IMV)			
No (I^2 = 0%)	14/70	28/74	0.41 (0.19-0.88)
Yes (I^2 = 44.1%)	208/608	397/951	0.69 (0.55-0.86)
Oxygen treatment without IMV (RECOVERY)	298/1279	682/2604	0.86 (0.73-1.00)
Taking vasoactive medication			
No (I^2 = 0%)	51/184	68/184	0.55 (0.34-0.88)
Yes (I^2 = 0%)	76/169	74/158	1.05 (0.65-1.69)
Age, y			
≤60 (I^2 = 0%)	72/338	141/483	0.67 (0.48-0.94)
>60 (I^2 = 49.7%)	150/339	284/541	0.69 (0.51-0.93)
Sex			
Female (I^2 = 0%)	60/202	106/286	0.66 (0.43-0.99)
Male (I^2 = 14.7%)	162/476	319/739	0.66 (0.51-0.84)
Symptomatic, d			
≤7 (I^2 = 69.1%)	51/130	99/211	0.63 (0.39-1.04)
>7 (I^2 = 0%)	139/418	293/693	0.64 (0.49-0.83)



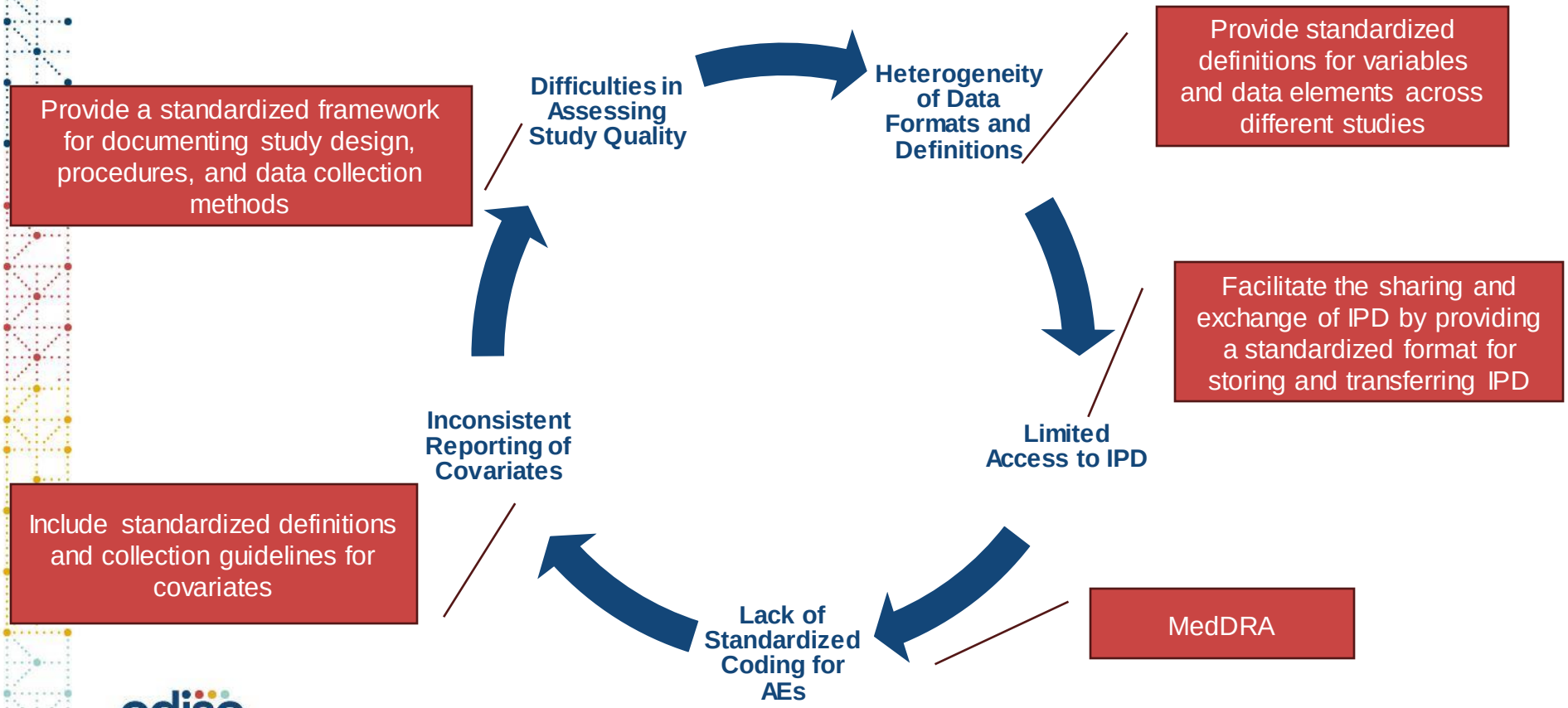
- Reduced Mortality
- Guidance for Treatment Protocols
- Global Health Impact
- Informed Clinical Practice

Challenges in Meta-Analysis

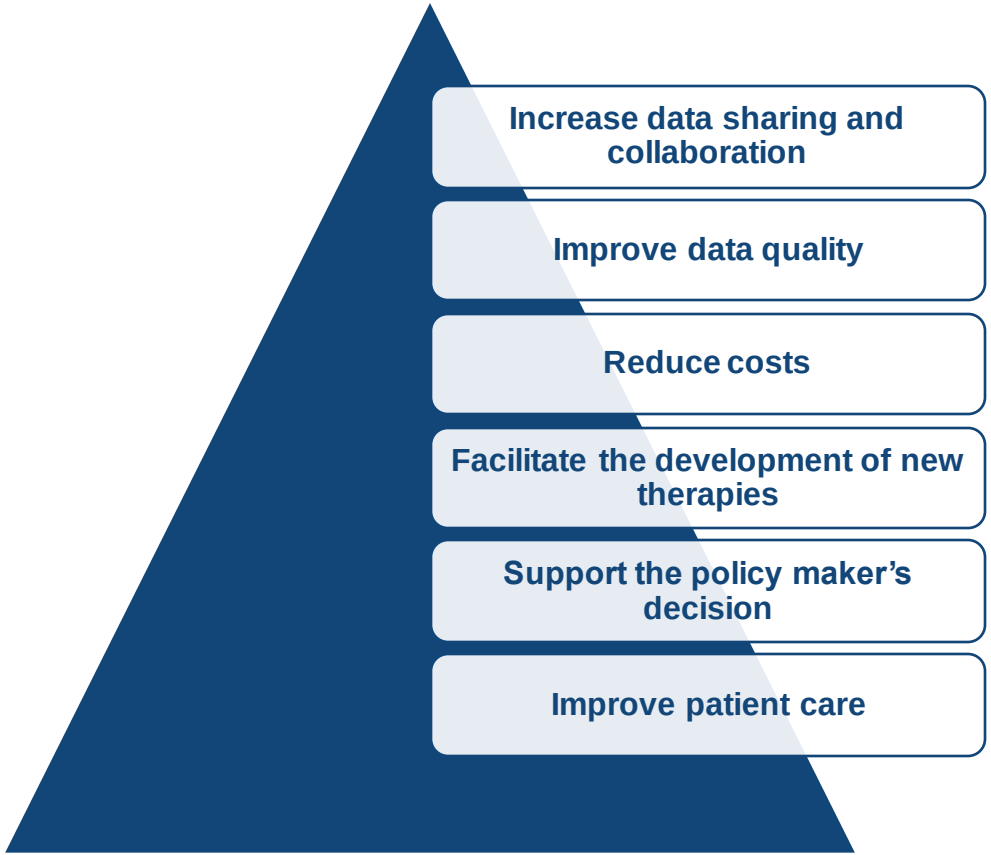
- **Scenario**: Loop Diuretics and Weight Change in Heart Failure: A Meta-Analysis
- Being conducted at University of Oxford, pooling multiple IPD RCTs trial data from pharmaceutical companies

Challenges in Meta-Analysis

Enhancing Meta-Analysis with CDISC Standards



Future of Research with CDISC



CDISC is being used in academic research

- The Alzheimer's Association is using CDISC standards to collect and share data from its Alzheimer's Disease Neuroimaging Initiative (ADNI).
- The National Institutes of Health (NIH) is using CDISC standards to collect and share data from its many clinical trials.
- The Cancer Research Institute (CRI) is using CDISC standards to develop a database of cancer clinical trials.

Alzheimer's Disease Neuroimaging Initiative (ADNI)

- ADNI, launched in 2004, aims to develop and validate biomarkers for Alzheimer's disease through neuroimaging and biofluid analysis. It has undergone several phases, including ADNI1, ADNI-GO, ADNI2, and ADNI3.
- The Private Partners Scientific Board (PPSB) , composed of industry, biotechnology, diagnostic, and non-profit organizations, has been instrumental in financing and providing scientific support to ADNI.
- The PPSB has established working groups that assess new technologies, platforms, and methods for potential adoption by ADNI.
- During ADNI2, a Database WG was formed, dedicated to common interests and issues for sponsors such as reconciliation of the clinical database. CDISC standards is used for the creation of a common relational database, and annotation of endpoints in the database.

Thank You!