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IMEDS: Sentinel and OMOP Programs

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Leveraging Big Data II

University of Maryland Center of Excellence in Regulatory Science and Innovation

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IMEDS Program

Mini-Sentinel, OMOP and IMEDS

- **Innovation in Medical Evidence and Surveillance (IMEDS)** is building upon the considerable progress of two pilot projects launched after the signing of the FDA Amendments Act of 2007
    1. Mini-Sentinel: an initiative focused on the conduct of active medical product safety surveillance, supporting the FDA's regulatory decisions
    2. Observational Medical Outcomes Partnership (OMOP): a separate initiative focused on the study of how electronic healthcare data can be used to evaluate the safety of medical products

- OMOP was managed by the Foundation for the National Institutes of Health (FNIH) and, as originally planned, was transitioned to the Reagan-Udall Foundation for the FDA (RUF) where it is now incorporated into the IMEDS program

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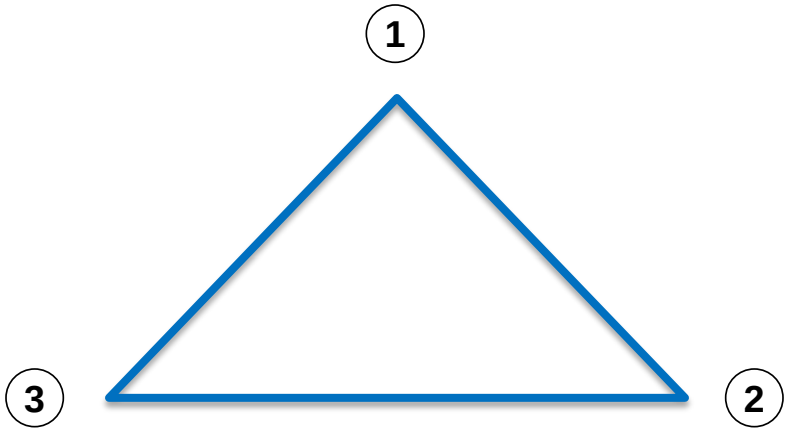
IMEDS Program

Key Areas

IMEDS will help the FDA, regulated industry and clinicians improve patient care and the safety of medical products by focusing on three areas.

IMEDS-Methods

Facilitate methods research aimed at monitoring safety of marketed medical products.



IMEDS-Evaluation

Use research findings to help understand the risks and benefits of marketed medical products.

IMEDS-Education

Train scientists in how to conduct methods research using electronic healthcare data.

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IMEDS Program

What is "methods research", and why is it necessary?

- Electronic healthcare data, including data from health insurance claims and electronic health records, are routinely captured across the health care system
- For the context of IMEDS, "methods research" includes the study and development of analytical tools to identify knowledge from electronic healthcare data. The tools and knowledge are then used to develop a better understanding of what the data shows about the benefits, risks, and outcomes of medical products

Who uses the findings from methods research, and why do they use them?

- **FDA:** to monitor safety of marketed medical products it regulates
- **Regulated Industry:** to monitor safety of medical products (e.g., drugs) it manufactures
- *All* stakeholders could potentially use methods research findings for broader purposes beyond medical product safety (e.g., compare the effectiveness of two medical products)

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IMEDS Program

What are examples of IMEDS methods research?

- Improve upon and create methods and tools that will advance the ability to identify potential medical product safety issues from electronic health data
- Support FDA's public health mission by establishing empirically-based scientific best practices that could be directly applied within the national Sentinel system
- Establishing a framework for evaluating how and when observational electronic health data can be used appropriately to "rule out" false safety signals
- Continue to explore, evaluate, and enhance the use of common data models that support the use of electronic health data from disparate sources for the assessment of medical product safety and effectiveness

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IMEDS Program

What benefits will IMEDS produce?

1. Research findings, governance decisions, funds received and program activities are shared with the general public with **full transparency**
2. **IMEDS research laboratory** provides researchers with access to numerous and diverse data sources, increasing the quantity and quality of methods research
3. Opportunities to **collaborate with data partners** through a distributed network
4. **Engagement with diverse research participants** helps ensure the most innovative, accurate research methods are developed
5. **RUF's affiliation with FDA** enables alignment between FDA needs and IMEDS research

FDA: more reliable data insights, enabling quicker responses to patient health issues

Regulated Industry: opportunity to play role in helping develop tools to evaluate safety of medical products

Patients: faster, more accurate insights to improve patient safety and health

Data Partners, Payers: better understanding of data and methods for evaluating safety among beneficiaries

Academia: additional training, research opportunities for faculty and graduate students

IMEDS Accomplishments

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IMEDS Program

Accomplishments

- Created Charter - principles and policies , roles and responsibilities of the various IMEDS governing bodies and collaborators , how decisions will be made
- Stakeholder Governance – Steering and Scientific Advisory committees representing FDA, consumers, academia, pharma industry, data partners
- Methods Research Agenda – collaboratively developed
- Funding Diversification plan
- Methods Evaluation Pilot

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IMEDS Governance

Steering Committee (Jul. 2013 – Present)

Member	Organization
Marcus D. Wilson, PharmD	• President, HealthCore, IMEDS Steering Committee Chair
Elizabeth B. Andrews, PhD	• Vice President of Pharmacoepidemiology and Risk Management, RTI
Robert M. Califf, MD	• Vice Chancellor for Clinical and Translational Research, Duke University
Patrizia A. Cavazzoni, MD	• Senior Vice President for Worldwide Safety and Established Products Regulatory, Pfizer
Karen Midthun, MD	• Director, Center for Biologics Evaluation and Research, FDA
Jane Perlmutter, PhD	• Founder, Gemini Group
Michael Rosenblatt, MD	• Executive Vice President and Chief Medical Officer, Merck
John S. Santa, MD, MPH	• Director, Health Ratings Center, Consumer Reports
Janet Woodcock, MD	• Director, Center for Drug Evaluation and Research, FDA
RUF Board Liaison Committee	• Mark McClellan, M.D., PhD, Garry Neil, M.D., Richard Schilsky, M.D., Diana Zuckerman, PhD

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IMEDS Governance

Scientific Advisory Committee (Aug. 2013 – Present)

Member	Organization
Jesse Berlin, ScD	• VP, Johnson & Johnson Epidemiology, IMEDS Scientific Advisory Committee Chair
Robert Ball, MD, MPH, ScM	• Deputy Director, Office of Surveillance and Epidemiology, Center for Drug Evaluation and Research, FDA [Non-Voting Member]
Lesley Curtis, PhD	• Associate Professor, Duke University School of Medicine
Ralph Horwitz, MD, MACP	• Senior Vice President for Clinical Sciences Evaluation, GlaxoSmithKline; Harold H. Hines, Jr. Professor Emeritus of Medicine and Epidemiology, Yale University
Steve J. Jacobsen, MD, PhD	• Director of Research and Evaluation, Kaiser Permanente
David Martin, MD, MPH	• Director of the Division of Epidemiology, Office of Biostatistics and Epidemiology, CBER, FDA [Non-voting member]
Jennifer Clark Nelson, PhD	• Associate Investigator at Group Health Research Institute (GHRI) and Affiliate Associate Professor in Department of Biostatistics , Univ. of Washington
Sally Okun, RN	• Vice President of Advocacy, Policy and Patient Safety, PatientsLikeMe
Marc Overhage, MD, PhD	• Chief Medical Informatics Officer, Siemens Healthcare
Nancy Santanello, MD, MS, FISPE	• VP and Head of Epidemiology, Merck Research Laboratories
Azadeh Shoaibi, MS, MHS	• Methodology/Epidemiology Lead, Sentinel Initiative, Office of Medical Policy, CDER, FDA. [Non-voting member]
Miriam Sturkenboom, PhD, PharmD	• Professor, Analysis of Observational Data, Departments of Medical Informatics and Epidemiology, Erasmus University Medical Center

IMEDS-Methods

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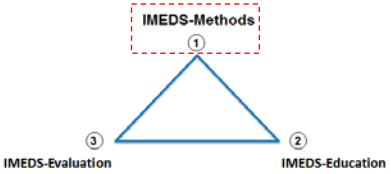
IMEDS-Methods

Research Agenda Overview



- **IMEDS-Methods Mission:**
  - To support FDA's mission by initiating and facilitating the execution of methodological research aimed at improving upon the tools for conducting post-marketing safety surveillance using automated healthcare data.

- **High level areas recommended by the SAC:**
  - Convert the results of the "OMOP Experiment" into practical advice for the conduct and interpretation of Mini-Sentinel work.
  - Assess new tools being developed in and for Mini-Sentinel.
  - Move beyond what was done in OMOP or has been done in Mini-Sentinel to develop tools and data that would assist FDA and other stakeholders in monitoring the safety of medical products.

IMEDS-Evaluation

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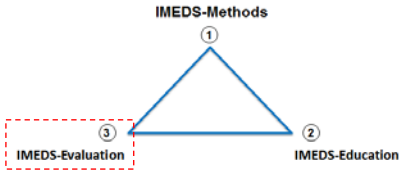
IMEDS-Evaluation

Background



- Mini-Sentinel is an FDA initiative (contracted through Harvard-Pilgrim) to complete safety assessments of marketed medical products using electronic health care data.

- FDA's vision for Sentinel includes leveraging the tools and system capabilities for broader public health and safety uses by stakeholders other than FDA.

- The goal for IMEDS-Evaluation is to apply lessons learned from IMEDS-Methods and the tools, capabilities used by Sentinel, to enable non-FDA entities (such as Industry) to sponsor safety assessments of marketed medical products.

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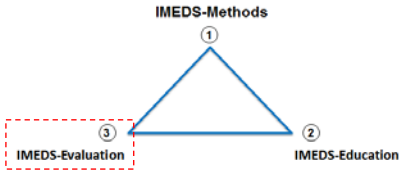
IMEDS-Evaluation

Background (continued)



- IMEDS-Evaluation could enable:
  - Proactive monitoring of marketed medical products utilizing MS tools and capabilities.
  - More efficient opportunities for pharmacovigilance plans (e.g., Phase IV studies).
  - Replication with sensitivity analyses of MS queries.

- FDA, Mini-Sentinel Operations Center (Harvard-Pilgrim), MS Data Partners, and representatives of the Industry are in support of IMEDS-Evaluation and its goals; all have agreed that there are several legal, financial, and operational questions to be addressed for its success.

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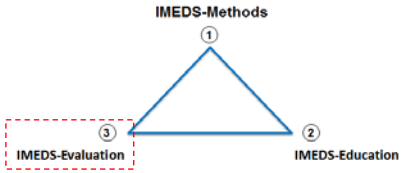
IMEDS-Evaluation

Potential Engagement Types



1. **At the time of NDA or BLA as part of a risk management (pharmacovigilance) plan**
   - Prior to approval, the manufacturer proposes using the IMEDS distributed database as part of a pharmacovigilance plan
   - FDA determines if the system could be used by the manufacturer to fulfill a postmarketing requirement (PMR) or postmarketing commitment (PMC)

2. **New signal arises from Mini-Sentinel query**
   - To *reactively* engage the IMEDS distributed database (i.e., after an FDA MS query is made public or disclosed to the manufacturer through ongoing discussions with FDA)
   - Opportunity for further refinement of signal using sensitivity analyses on the MS query (e.g., by modifying definition of exposure or adverse event measured) to evaluate the robustness of the MS query results

3. **Proactive safety surveillance queries**
   - To *proactively* engage the IMEDS distributed database with the intent of conducting safety surveillance
   - This engagement may (or may not) be restricted to safety concerns in which the rarity of the condition, drug exposure, or safety events are such that data from multiple data partners would be required
   - May be used for evaluating Risk Evaluation and Mitigation Strategies (REMS)