Tufts Medicine
Tufts Medical Center

Methods Innovation Team

Team Meeting

November 15, 2022

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Methods Innovation Team Meeting Participants

Name	Organization	
Fotios Kokkotos	**NEWDIGS**	**Methods Innovation Team Lead & Meeting Facilitator**
Keileen Hopps	NEWDIGS	Scribe
Paul Beninger	Tufts	
John Ferguson	Sanofi	
Smita Kothari	Merck	
Jiaching Lin	Takeda	
Peter Loupos	Princeton Healthcare Strategies, LLC	
Lynn Sanders	Takeda	
Asvin Srinivasan	Onc.AI	
Wenting Wang	Sanofi	
Chunlei Zheng	VA Boston Healthcare System	

Team Meeting & Report Out Timing

1:45-3:15 pm Team Meeting

- 10 minutes – Introductions and presenter selection
- 70 minutes – Discussion
- 10 minutes – Presentation coordination

Notes and instructions

- **Each team will need to pick a presenter for the Report Out session that follows the team meeting session. *Please do this first!***
- **Each team meeting will be facilitated by the Team Lead and have a pre-selected scribe(s).**
- **At 3:15 pm, please send the presentation to the email hyperlinked on the last slide.**

3:15-3:30 pm Break

3:30-4:30 pm Team Reports and Group Discussions

Per team:

- 10 minutes – report out
- 5 minutes - Q&A

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Agenda

- ❑ Discussion
  - Clinical Practice Gaps
  - Data Exclusion Cycle
  - Growing Library of Risk Bias Tools
  - Metrics under consideration
    - **Clinical Outcomes Metrics**
      - Median Overall Survival (OS)
      - Time to treatment failure
      - Median Progression Free Survival (PFS)
    - **Impact Measures**
      - Time to treatment/"effective treatment”
      - Total cost of care
- ❑ Review & Refine
  - Data Characterization and Technical Skills Framework
  - Machine Learning & Statistical Methods Outline
  - Federated Machine Learning Process and FL Network Outline
- ❑ Future Action
  - Timeline? Deliverables? Etc.

Clinical Practice Gaps for aNSCLC

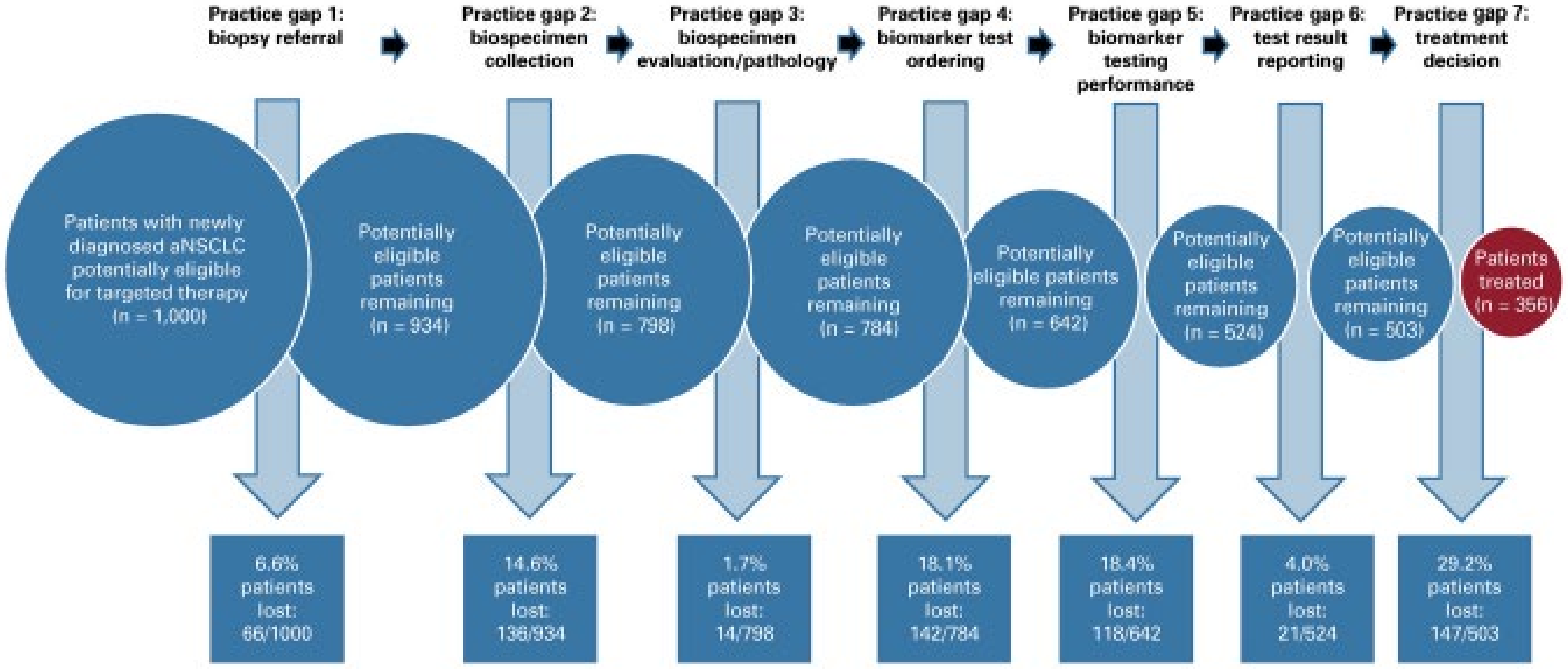

Illustration from Sadik, H., et al. Impact of Clinical Practice Gaps on the Implementation of Personalized Medicine in Advanced Non–Small-Cell Lung Cancer. *JCO Precision Oncology 2022:6*

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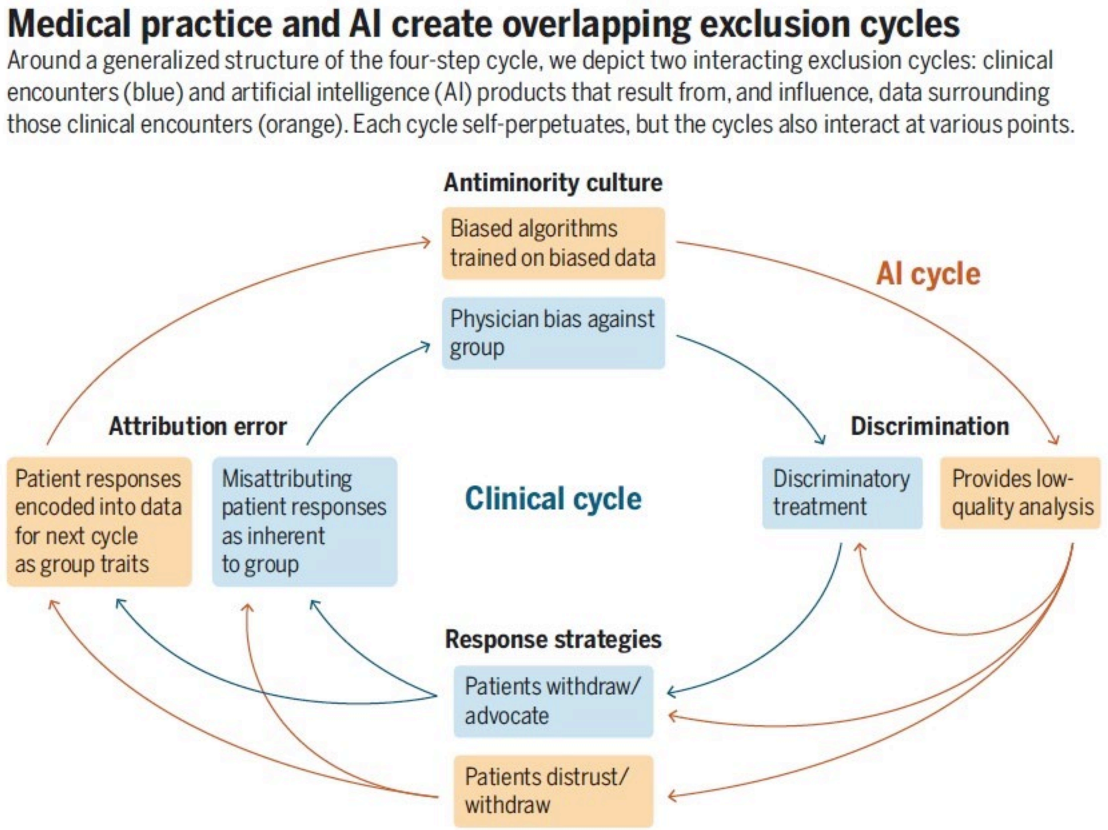
Data Exclusion Cycles & Health Disparities Biases

How can we expand what the “real world” is viewed as being?

- Ex.: Payers using their data to develop population-level statistics and analysis that frame the overall population within their own narrow confines (e.g., higher-income level individuals with private healthcare coverage, etc.)
- We’re focusing on minimizing the health disparities biases inherent in many current large data sets, e.g., Medicare



Exclusion cycles illustration from Bracic A, Callier SL, Price WN. Exclusion cycles: Reinforcing disparities in medicine. Science. 2022;377(6611):1158-60.

Growing Library of *Risk of Bias* Tools

Riskofbias.info

RoB 2 tool (revised tool for Risk of Bias in randomized trials)

ROBINS-E tool (Risk Of Bias in non-randomized Studies - of Exposures)

ROB ME (Risk Of Bias due to Missing Evidence in a synthesis)

ROBINS-I tool (Risk Of Bias in Non-randomized Studies - of Interventions)

robvis (visualization tool for risk of bias assessments in a systematic review)

PROBAST: Prediction model Risk of Bias Assessment Tool

Potential LEAPS Opportunity
Data Assessment and Risk Engineering (DARE Framework)

- Question: Can the diversity of data sets strategically selected for a Federated Learning study (and platform) reduce the risk of bias related to under-represented patient sub-populations?

Metrics under consideration

Clinical Outcomes Metrics

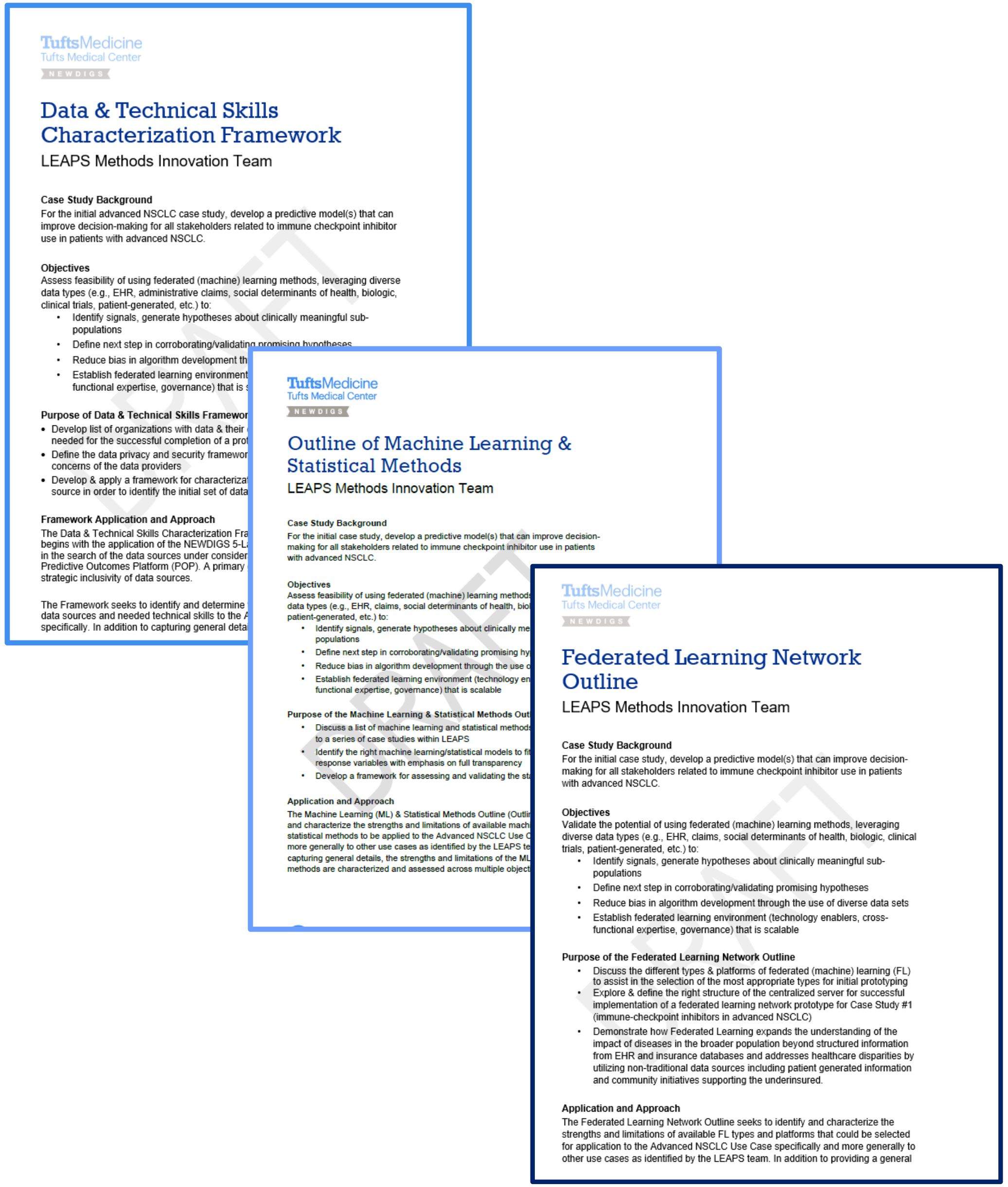
- Median Overall Survival (OS)
- Time to treatment failure (TTF)
- Median Progression Free Survival (PFS)

Impact Measures

- Time to treatment/"effective treatment”
- Total cost of care

Review & Refine

- Data Characterization and Technical Skills Framework
- Machine Learning & Statistical Methods Outline
- Federated Machine Learning Process and FL Network Outline



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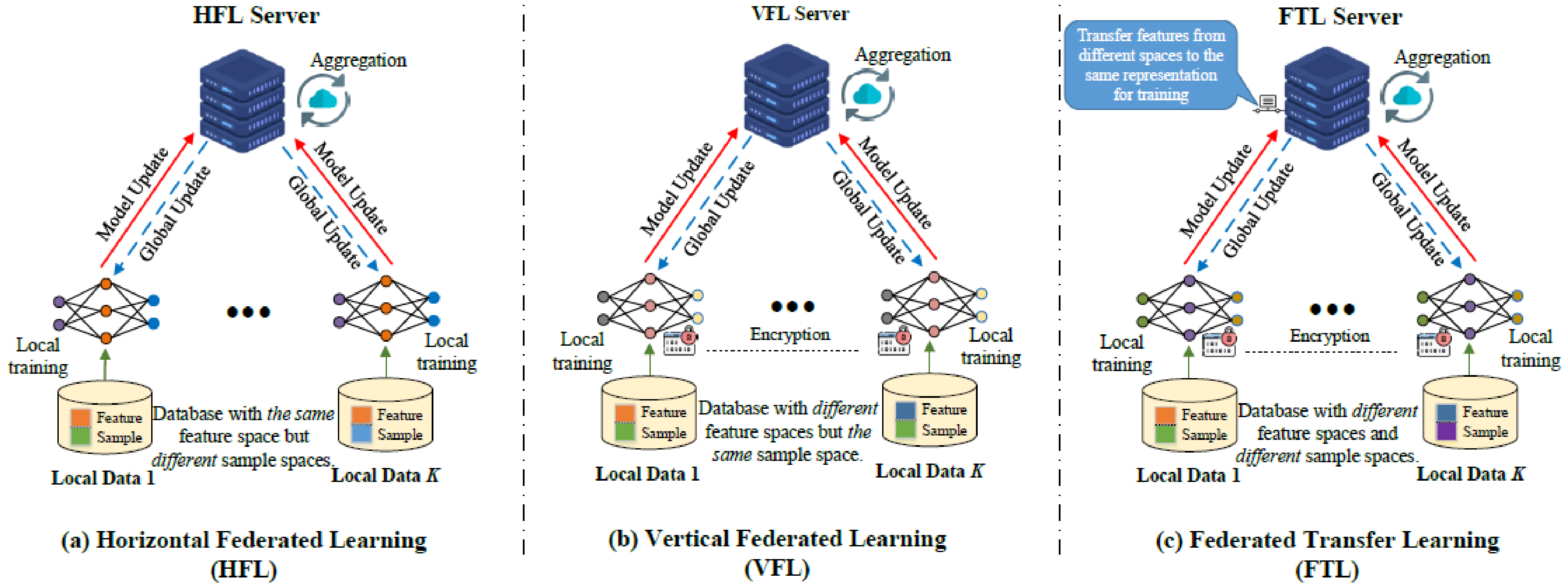
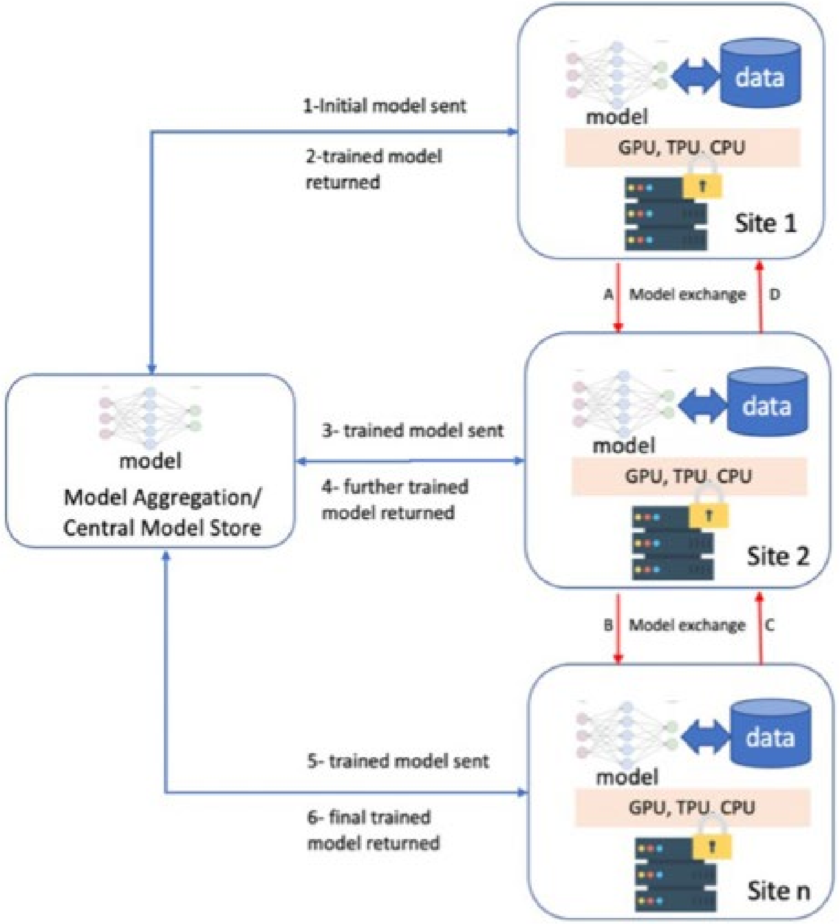
Categories of Federated Learning



Categories of FL used in smart healthcare

Dinh C. Nguyen, et al. ACM Comput. Surv., Vol. 1, No. 1, Article . Publication date: November 2021

Federated Learning Overview



Federated Learning Overview and two different approaches; 1-6 model exchange via a centralized model store, A-D direct model exchange among the participating sites.

Topaloglu et al. Frontiers in Artificial Intelligence. www.frontiersin.org 1 October 2021 Volume 4 Article 746497

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Future Action for Methods Team

November 2022-June 2023

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