

Knowledge Discovery in Maternal Fetal Datasets to Advance Women's Health Research

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Motivation

- Over 10 million pregnant or lactating women at a given time in the USA
- 5% of the female population in reproductive age (age: 18-50)
- Perinatal mortality ~ 5-6:1000 (CDC)
- Maternal Morbidity and Mortality indexes are **population health measure**
- 12 to 28 maternal deaths per 100,000 live births
- 1200 maternal deaths/year
- 60,000 women suffer pregnancy related near fatal complications
- In December 2018, the bill introduced by the United States Congress **“Preventing Maternal Deaths Act of 2018”** was signed into law.
- Trans-NIH Women’s Health Research

Justification

- 2019-2023 Trans-NIH Strategic Plan for Women's Health Research
 - To advance rigorous research that is relevant to the health of women
 - To enhance dissemination and implementation of evidence to improve the health of women
 - To promote training and careers to develop a well-trained, diverse, and robust workforce to advance science for the health of women
 - To improve evaluation of research that is relevant to the health of women
- 2017-2016 NLM Strategic Plan
 - Accelerate discovery and advance health through data driven research
 - Connect the resources of a digital research enterprise
 - Engage in health care research through data integration and analysis

Objectives

- Integrate challenging data sources to increase the power analysis of recognized sparse and complex data
- Apply and develop machine and deep learning algorithms on challenging health care data to uncover predictive models to decrease Maternal Morbidity and Mortality
- Specific objectives
 - Identify and normalize common variables from the two datasets
 - Duplicate-Expand maternal transfusion prediction model
 - Apply and discover Machine Learning methods for automatic discovery

Data

- Consortium for Safe Labor
 - Cesarean Registry
- Both datasets are de-identified
 - No dates
 - No addresses – specific locations
 - Permission to use but not to share or distribute