A meta-analytical framework to accelerate comparative effectiveness research conducted within clinical data research networks
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Research networks embedded in healthcare systems such as PCORnet provide the unique opportunity to efficiently address a wide variety of patient-centered research questions in a broadly generalizable patient population. These research networks allow us to answer questions that would be expensive or infeasible to address using traditional randomized controlled trials and to rapidly disseminate this information into clinical practice within the constituent healthcare systems. This study proposes to develop statistical methods to optimize the analysis of information derived from studies conducted within these networks.

Despite the great potential of using data from multi-site research networks embedded in healthcare systems, the large volume of data and the need to preserve patient privacy and protect data security have generated additional challenges for analysis. Existing distributed analysis methods to address these challenges are limited in two important ways: (1) they focus on analyzing one outcome at a time and (2) they focus on comparing one pair of interventions at a time.

The overarching goal of this pilot proposal is to develop a multivariate meta-analytical framework for evidence synthesis to simultaneously compare multiple treatment options and multiple clinical outcomes in the clinical data research network setting, and to develop personalized utility functions and associated visualization tools that are patient and stakeholder centered to aid in decision making. Success of the proposed research will establish the feasibility of the joint evaluation of multivariate clinical outcomes and simultaneous comparison among multiple treatment options in multi-site research networks.