

The overall aim of the NIAAA-funded Consortium to improve Outcomes in HIV/AIDS, Alcohol, Aging, & Multi-Substance Use (COMpAAAS) is to build and disseminate the evidence needed to optimize care for HIV+ individuals experiencing medical harm from alcohol and related substance use, through coordinated, integrated, and externally validated observational, operations research modeling, and intervention studies. Combining and integrating the complementary expertise of informatics, biostatistics and epidemiology, we propose a U24 Resource for Informatics and Biostatistics (RIB) to support and inform the other COMpAAAS components. This resource will address the complex challenges required to maximize power and minimize bias in analyses addressing consortium-wide questions. Advanced informatics methods supported include natural language processing (NLP), ontologies, database and clinical decision support, and application of vital data management tools for secure data collection, storage, annotation, retrieval, and integration. Advanced epidemiological and statistical methods include time-updated exposure techniques, multiple imputation, propensity score techniques, measurement error correction, and competing risks regression. Routine, but essential, statistical methods include Cox proportional hazards, logistic and linear regression, goodness of fit diagnostics, and agreement/accuracy metrics (kappa, sensitivity, specificity, etc.). The RIB will further leverage the observational and interventional studies, simulation models, and well-coordinated network of cores and workgroups of COMpAAAS with advanced informatics and biostatistical techniques tailored to the particular challenges of large scale, longitudinal data from multiple sources including electronic health records (EHR), clinical interventions, patient self-report, and tissue repositories. Our specific aims are to provide 1) statistical and 2) informatics expertise for COMpAAAS to maximize scientific impact. To accomplish this, we will enhance the design, recruitment, and follow-up of intervention studies, support appropriate design and execution of data analyses and cross cohort collaborations, provide advanced statistical methods plus estimates of alcohol patterns for OR modeling and identify sexual/gender minority populations (CHAMP) from VACS survey data. In addition we will enhance the Consortium Web-Based Laboratory (WBL Portal) informatics infrastructure to support ongoing research design, data collection and management, development and testing of interventions such as clinical decision support and eHealth tools and enhance support for the analysis of textual data.