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High-dimensional propensity score adjustment in HIV research using linked administrative health data

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Background

Despite not being collected for research purposes, linked administrative health data are increasingly being used to conduct observational epidemiologic analyses. In the field of HIV research in British Columbia (BC), Canada, the Comparative Outcomes And Service Utilization Trends (COAST) Study is based on a linkage between HIV-related clinical data and several provincial administrative health datasets. Specifically, the BC Centre for Excellence in HIV/AIDS Drug Treatment Program, which manages antiretroviral therapy (ART) dispensation for all known people living with HIV (PLWH) in BC, is linked with several Population Data BC data holdings. Population Data BC is a repository that houses longitudinal administrative data for all BC residents.

methodology in COAST will enhance our ability to generate stronger evidence to inform strategies that may improve the health and wellbeing of PLWH in this setting.

Rationale

While the use of administrative data for research poses several challenges, bias due to confounding remains to be a key issue in this context. While randomized controlled trials of ART are common, an objective of COAST is to further examine the "real-world" impact of ART on health and clinical outcomes in a population-based sample of 13,907 PLWH in BC. Therefore, while longitudinal administrative data provide a unique opportunity to estimate the effect of ART on outcomes that are infrequently assessed in trials (e.g., chronic conditions), such data often lacks information on sociodemographic, socioeconomic, and behavioural confounders.

Approach

It has been shown that adjustment for large numbers of covariates, in the form of administrative codes (e.g., diagnostic ICD codes, procedure codes, drug identification numbers), allows for better control of confounding bias. Therefore, relying on an established methodology in pharmacoepidemiology, we will use the high-dimensional propensity score algorithm to select and prioritize covariates (codes) that collectively act as proxies for unmeasured confounders. The use of this causal inference

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