

reviewed. After initial general data collection phase, we categorized data as “must have” and “good to have.” “Must have” variables were defined as data variables that were essential for the study outcomes. “Good to have” variables would not affect the main outcomes of the study if missing. We measured completeness of data using the in-built REDCap data quality check feature. We used several strategies to encourage reduction of missing data. We initially did random data checks but noted that the amount of missing data was substantial and could not be adequately addressed this way. Second, we created excel sheets highlighting missing data for each site and notified sites. This proved onerous to create and made it burdensome for sites to identify easily where data was missing. Third, we built a custom report form in REDCap specifically able to identify which “must have” data points were missing. This could be easily accessed by the principal investigator at each site and made completing the data forms more straightforward. We encouraged all sites to complete their data collection by sending weekly data reports to each site highlighting the patients with missing data. An instructional YouTube tutorial was also created and the link was shared with all sites to demonstrate how to use the custom built report form in REDCap and how to appropriately fill in the missing data. Since this was a global study, we communicated with sites using a variety of locally favored mechanisms including Zoom, FaceTime, WeChat, WhatsApp as well as email. By harnessing the buy-in of local champions our approach was successful. RESULTS/ANTICIPATED RESULTS: The total number of patients recruited for the CERTAIN study is 4843. The rate of all missing variables improved with the efforts described above. Hospital admission dates were missing in 8.4% pre efforts and 4.2% post efforts ($p < 0.01$). ICU admission dates were missing in 5.5% pre and 2.0% post ($p < 0.01$). Documentation of completion of processes of care (including central line review, urinary catheter review, consideration for blood transfusion) improved significantly from pre to post ($p < 0.01$). DISCUSSION/SIGNIFICANCE OF IMPACT: Missing data can be a problem in all types of research studies. This study provides some preliminary evidence for effective approaches that can reduce the problem of missing data when conducting a global study at sites with limited research infrastructure in place. By addressing the concern about missing data, we can be more confident that our results can be accurately analyzed and interpreted, improving the quality of the research.

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Big data approaches in translational science: The influence of psychiatric and trauma history in predicting smoking during pregnancy in a cohort of female like-sex twin pairs

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OBJECTIVES/SPECIFIC AIMS: Smoking during pregnancy (SDP) is associated with negative health outcomes, both proximal (e.g., preterm labor, cardiovascular changes, low birth weight) and distal (e.g., increased child externalizing behaviors and attention deficit/hyperactivity disorder (ADHD) symptoms, increased risk of child smoking). As pregnancy provides a unique, strong incentive to quit smoking, investigating SDP allows analysis of individual predictive factors of recalcitrant smoking behaviors. Utilizing a female twin-pair cohort provides a model system for characterizing genotype × environment interactions using statistical approaches. METHODS/STUDY POPULATION: Using women from the Missouri Adolescent Female Twin Study, parental report of twin ADHD inattentive and hyperactive symptoms at twin median age 15, and twin report of DSM-IV lifetime diagnosis of major depressive disorder, trauma exposure (physical assault and childhood sexual abuse), collected at median age 22, were merged with Missouri birth record data for enrolled twins, leading to 1553 individuals of European ancestry and 163 individuals of African-American ancestry included in final analyses. A SDP propensity score was calculated from sociodemographic variables (maternal age, marital status, educational attainment, first born child) and used as a 6-level ordinal covariate in subsequent logistic regressions. RESULTS/ANTICIPATED RESULTS: For European ancestry individuals, parental report of hyperactive ADHD symptoms and exposure to childhood sexual abuse were predictive of SDP, while a lifetime diagnosis of major depressive disorder, parental report of inattentive ADHD symptoms, and exposure to assaultive trauma were all not significantly predictive of future SDP. For African-American individuals, none of these variables were significant in predicting future SDP. DISCUSSION/SIGNIFICANCE OF IMPACT: Understanding this relationship of risk-mechanisms is important for clinical understanding of early predictors of SDP and tailoring interventions to at risk individuals. Ultimately,

the focus of this research is to mitigate risk to pregnant smokers and their children. Additionally, the cohort-ecological approach informs how well research and administrative (vital record) data agree. This allows for evaluation of whether administrative data improve prediction in research cohorts, and conversely if research data improve prediction over standard sociodemographic variables available in administrative data.

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Characterizing physician trust and healthcare-based discrimination among long-term HIV viral trajectory groups in Washington, DC

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OBJECTIVES/SPECIFIC AIMS: Discrimination within the healthcare system and physician distrust have been associated with adverse clinical outcomes for people living with HIV; however, many studies do not link these variables to biological data. We hypothesize that perceived healthcare discrimination and physician distrust associates with higher longitudinal viremia among HIV-positive women. METHODS/STUDY POPULATION: A 2006 cross-sectional survey assessed healthcare-based discrimination and physician trust in 92 HIV-positive and 46 high-risk HIV-negative women from the Washington DC Women's Interagency HIV Study (DC-WIHS). In addition, we identified HIV viral load trajectories and demographics from the HIV-positive women who contributed ≥ 4 semi-annual visits from 1994 to 2015. Viral suppression was defined by assay detection limits (<80 to <20 copies/mL). Group-based probability trajectory analyses grouped women based on longitudinal viral load patterns, and identified 3 groups: sustained viremia ($n = 32$) with low-viral suppression over time, intermittent viremia ($n = 27$) with varying suppression over time, and non-viremia ($n = 33$) with high-longitudinal viral suppression. Ordinal logistic regression models assessed trajectory group and discrimination variables, controlling for demographics, using stepwise selection with significance level of $\alpha = 0.05$. RESULTS/ANTICIPATED RESULTS: Most women were African American (60%), insured at the time of visit (89%) and nonsmokers (56%). While physician trust did not differ by HIV viral trajectory group, trust was lower among HIV-negative women compared with HIV-positive women ($p = 0.03$). Over 1 in 5 HIV-positive women reported discrimination in the healthcare system based on HIV status (21.3%). Report of discrimination based on drug/alcohol use was higher among HIV-negative participants (19.2% vs. 6.5%, $p = 0.01$). Among women with longitudinal sustained viremia, report of discrimination based on race ethnicity (29%, $p = 0.004$) and sexual orientation (15.6%, $p = 0.008$) were higher than within the nonviremic and intermittent trajectory groups. DISCUSSION/SIGNIFICANCE OF IMPACT: Physician trust did not associate with increased longitudinal viral suppression among HIV-positive women in Washington, DC. Lack of physician trust among high-risk HIV-negative women could have implications for uptake of prevention methods. Reports of discrimination vary between HIV-positive and HIV-negative women in the Washington, DC area. The findings of healthcare system distrust among HIV-negative women has implications outside the realm of HIV, as this lack of trust may impact risk for other disease states among similar populations of women.

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Cognitive and behavioral side effects in patients treated with droxidopa for neurogenic orthostatic hypotension

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OBJECTIVES/SPECIFIC AIMS: To describe adverse behavioral symptoms attributed to droxidopa therapy for neurogenic orthostatic hypotension (nOH). METHODS/STUDY POPULATION: BACKGROUND: Droxidopa, a norepinephrine (NE) precursor, improves symptoms of nOH by replenishing NE levels. Central NE effects are poorly described but may offer potential benefits given the pathophysiologic progression of α -synuclein-related disorders. Here we report a series of cognitive and behavioral side effects linked to droxidopa therapy. METHODS: We identified 5 patients treated at Vanderbilt University who developed behavioral symptoms including mania, irritability, and disorientation shortly after the initiation of droxidopa for nOH. Comprehensive chart reviews were performed for all patients, including analysis of droxidopa titration schedule and dosing, medical comorbidities, clinical course,