**Draft AcademyHealth Annual Research Meeting Submission**

**Title:** Comparison of Exposure and Mortality Risk Estimation Across Two Covid-19 Risk Score Calculators

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**Research Objective:** Online Covid-19 risk estimation tools give valuable insight to the general public, educating users and providing information and guidance which may reduce risk of transmission and mortality. However, many risk calculators are available, and their methods vary widely. We compared estimated exposure and mortality risk for the 19andMe and Nexoid Covid-19 Survival calculators, and examined sources of discrepancy.

**Study Design:** Using United States-based user records from the Nexoid Covid-19 calculator, we calculated exposure and mortality risk estimates using the 19andMe calculator and compared these risk estimates to the Nexoid exposure and mortality risk. We first compared mortality risk, establishing similarity via Spearman ranked correlation, and identified sources of discrepancy for cases where the 19andMe and Nexoid estimates deviated by over 10%.

**Population Studied:** We examined 51,799 anonymized records from the Nexoid calculator’s public records, for users located in the United States who input their demographic and medical information into the Nexoid calculator during the 90-day period from 2020-08-12 to 2020-11-10.

**Study Design:** Using 2008 Medicaid fee-for-service claims from 16 states, we calculated four state-specific follow-up rates: 7- and 30-day follow-up for mental health ED visits and 7- and 30-day follow-up for SUD ED visits. Follow-up was defined as an outpatient claim with a primary mental health or SUD diagnosis. We examined the distribution of state-level follow-up rates. We also used multivariate random-effects logistic regression to model the odds of follow-up as a function of beneficiary age, race/ethnicity, Medicaid eligibility category, ED diagnosis, and proximity to a metropolitan area.

**Population Studied:** We examined 31,952 mental health ED discharges across 16 states and 13,337 SUD ED discharges across 15 states during calendar year 2008 (the latest year available at the beginning of our study).

**Principal Findings:** Follow-up rates varied widely across states. On average, 66.0% of mental health ED discharges received follow-up within 7 days (from 35.4% in Kentucky to 89.4% in Georgia), whereas 76.1% received follow-up within 30 days (from 53.8% in Kentucky to 92.4% in Georgia). Likewise, for SUD discharges, an average of 66.6% received follow-up within 7 days (from 15.5% in Illinois to 90.3% in Georgia), whereas 68.7% received follow-up within 30 days (from 26.8% in Illinois to 90.3% in Georgia).

The results of multivariate logistic regression suggested that the odds of follow-up within 7 days after mental health ED discharges was worse for men (OR: .85; 95% CI: .80 -.90), African American non-Hispanics compared with non-Hispanic Caucasians (OR: .84; 95% CI: .78-.90), and those living in a rural area (compared with a metropolitan area; OR: .90; 95% CI: .84-.97). In contrast, the odds of follow-up were higher for people with a diagnosis of schizophrenia, bipolar disorder, psychoses, and major depression (relative to depression and other mood disorders). These findings were similar for 30-day follow-up. In addition, similar race/ethnicity- and diagnosis-related factors were associated with the odds of follow-up within 7 and 30 days after discharge for SUD ED visits.

**Conclusions:** Receipt of follow-up care after ED visits for mental health or SUD varies widely by state and is related to several beneficiary characteristics including sex, race, ED diagnosis, and living in a rural area.

**Implications for Policy or Practice:** State Medicaid programs have an opportunity to substantially improve follow-up care for mental health and SUD ED visits. Such efforts may focus on system-level barriers to follow-up care and specific groups of beneficiaries who are less likely to receive follow-up.