Comparing Outcomes of COVID-19 Positive Individuals with and without Chronic Kidney Disease using Python and CoRDaCo

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As of April 9th, 2021, there have been over 31 million cases of COVID-19 in the United States alone. Simultaneously, an estimated 15% of U.S. adults suffer from Chronic Kidney Disease (CKD). Individuals with CKD may be particularly vulnerable to COVID-19 as they have larger amounts of circulating ACE2, and the ACE2 receptor is essential for COVID-19 infection. This study is focused on understanding how the comorbidity of CKD impacts patient outcomes for COVID-19 positive individuals. Outcomes were defined as emergency department visitation rate, the median length of inpatient stay, inpatient admission rate, and mortality rate. Patients over the age of 18 who tested positive for COVID-19 between January 1-July 13, 2020 were included in this study from over 100 healthcare entities. The median Charlson index for the CKD (n=1,946) and Non-CKD (n=47,478) cohorts was 4 and 1 respectively. The CKD cohort was comprised of 52.5% women and 47.5% men. The Non-CKD cohort was comprised of 54.1% women, 45.4% men, and 0.5% other. The Non-CKD and CKD cohorts were further divided into 4 age-by-race subcategories, as race and age were significantly correlated with CKD. The CKD cohort had statistically higher ($p<.05$) ED visitation rates, mortality rates, and inpatient admission rates for all subcategories in comparison to the Non-CKD cohort. This study demonstrates that CKD may be associated with a higher severity of COVID-19 outcomes. Further research must be done to manage confounding variables and study this association more extensively.

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