Impact of COVID-19 on Alzheimer's Disease and Related Dementias (ADRD) Burdens and their Socioeconomic and Racial/Ethnic Disparities

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ABSTRACT:

By January 2023, over 96 million individuals in the U.S. had contracted SARS-CoV2, with nearly 1.1 million COVID-19 deaths, 80% of which were in persons aged 65+. COVID-19 mortality rates have been twice as high in older adults with ADRD than those without, but there are also severe concerns regarding symptom worsening among ADRD COVID survivors. It is as yet unknown whether and how the COVID-19 pandemic increased Alzheimer's disease and related dementia (ADRD) prevalence in the aging U.S. population. The pandemic period may have exacerbated existing racial/ethnic and socioeconomic status (SES) ADRD disparities. ADRD prevalence defined here as the diagnosis of ADRD or mild cognitive impairment (MCI), ADRD cognitive and neurological pathology, and accelerated progression of ADRD/MCI-related cognitive decline, may have been affected by many causal pathways during the COVID-19 pandemic, and this research aims to isolate these pathways to provide critical insights for health and long-term care planning and resource distribution to the most at-risk sub-populations and will inform responses to future pandemics.

Because up to one-third of COVID-19 patients exhibit neurological symptoms and preliminary evidence indicates COVID-19 survivors may be at elevated risk for a new ADRD diagnosis, the pandemic may have also increased prevalence of ADRD. Moreover, due to elevated rates of both ADRD and COVID-19 infections and mortality among racial/ethnic minorities and those with lower SES, COVID-19 may exacerbate preexisting disparities in ADRD prevalence among historically marginalized and disadvantaged groups.

Despite critical implications for disease burden, costs of care, and health disparities, these connections between COVID-19, ADRD, and racial and SES health inequities have not yet been fully and rigorously tested using causal inference methods, resulting in a weak evidence base to inform actions to remedy disparities in ADRD prevalence or prepare for increased ADRD caregiving and healthcare needs. To date, evidence on ADRD as a form of post-acute sequelae

of SARS-CoV-2 (PASC). PASC is highly methodologically heterogenous (regarding samples used, study period, research design, and cognitive measures), non-generalizable, and omits adequate longitudinal controls for preexisting ADRD and COVID-19 risk factors. Thus, the existing literature has failed to accurately identify the true effect of COVID-19 on ADRD and has not identified whether these effects differ across at-risk individuals and communities (e.g., affecting existing racial health gaps). Moreover, it is unknown which clinical, setting-of-care, and contextual factors are predictive of post-COVID ADRD prevalence or whether and how risks may have changed following the COVID-19 vaccine rollout.

This study addresses these gaps using preliminary data from Medicare Advantage claims (Optum Cliniformatics claims database) spanning several years pre- COVID (data are available starting 2007) through December 2021, as well as a cohort of older adults at high risk for ADRD from the NIA-funded Indiana Alzheimer's Disease Research Center (IADRC; 2015- onwards, N=571) with extensive clinical cognitive characterization and neuroimaging data (IADRC).

Specifically, this preliminary research will characterize changes in ADRD prevalence across phases of the COVID-19 pandemic and among baseline ADRD naïve and preexisting ADRD older adults, and by gender, racial identity and small-area socioeconomic characteristics. We hypothesize that ADRD prevalence has increased during the pandemic. ADRD prevalence in ADRD-naïve and older adults with preexisting MCI/ADRD diagnosis will be examined upto 1 year post pandemic onset using a cohort of patients in Medicare Advantage plans in the Optum Cliniformatics claims database. This research will serve as preliminary analyses that will allow future exploration of clinical, setting-of-care, and contextual mechanisms underlying elevated pandemic induced ADRD prevalence and their racial/ethnic disparities, using larger-scale samples possible with CMS Medicare claims data.