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**Mortality among Mental Health Services for Older Adults during the COVID-19 pandemic:
A retrospective analysis from South London**

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During the COVID-19 pandemic, older people with dementia and/or living in care homes had disproportionately high mortality rates (Suárez-González *et al.*, 2020). However, to our knowledge no study has investigated mortality within a mental health service for older adults (MHOA) covering both inpatient and outpatient settings.

We carried out a retrospective analysis of mortality in recent MHOA service users covering the first ten months of 2020 and comparing these to similar period in 2019 using data from the South London and Maudsley NHS Foundation Trust (SLaM) Biomedical Research Centre (BRC) Case Register. SLaM is the sole specialist mental healthcare provider for 1.2 million residents in a southeast London catchment including services for older adults and those with dementia, and the database has approval for secondary analysis (18/SC/0372). As a comparison, we obtained publicly available mortality data from the Office for National Statistics (ONS), for people of all ages for the SLaM Southeast London catchment area. Death within MHOA was defined if the patient was under MHOA at the time of death or if death happened within 30 days following discharge from MHOA.

We defined eleven 4-week periods from the beginning of week 1 to the end of week 44 of 2019 and 2020. We then determined the number of deaths and calculated the relative risk (RR) of mortality in each 4-week period in 2020 (exposure period for COVID-19) compared with same period in 2019 (unexposed period for COVID-19) for MHOA service users as well as for the SLaM catchment population.

In total 7,148 people died in the first 44 weeks of 2020 within the SLaM catchment, of whom 418 (5.8%) were SLaM MHOA patients. The most striking spike in mortality risk for MHOA patients occurred during weeks 13-16 (23rd March – 19th April 2020), while the general population had a significantly increased risk of death in weeks 13-16 (23rd March – 19th April 2020) and 17-20 (20th April – 17th May 2020) compared to 2019 (see Figure 1). Other than in the catchment population, no increased RR was detected in MHOA service users after 20th April 2020. Risk of death was neither increased nor decreased between weeks 21-44 in both the catchment and MHOA service user populations.

Our results suggest that the COVID-19 pandemic might have affected MHOA service users severely in its early phase.

While some of our findings can be explained by the higher age, co-morbidities and care home residence could also have played a role. It is known that 26.3% of all COVID-19 related deaths occurred in care home residents in England during 2020 and dementia and Alzheimer's disease were common (26%) pre-existing conditions cited for deaths involving COVID-19 (ONS, 2020). Patients with dementia and cognitive impairment may have had limited access to accurate information on the pandemic and, especially in the early stages, might not have been able to follow recommendations to reduce the spread of COVID-19 (Wang *et al.*, 2020). While age increases the risk of a more severe course of COVID-19 (Mok *et al.*, 2020), the underlying neurodegenerative process of dementia could also be implicated. APOE ϵ 4 has been associated with an increased COVID-19-related hospitalisation risk and, mechanistically, might be linked with increased cytokine production in response to inflammatory stimuli, which could intensify the already aggressive inflammatory response associated with COVID-19, resulting in a so-called cytokine storm (Mok *et al.*, 2020).

In conclusion, despite their higher age, which is usually associated with smaller social networks (English and Carstensen, 2014) and consequently a lower viral infection risk, mortality in users of MHOA services increased rapidly in the beginning of the pandemic. Hence, this is a group which needs special protection early in a pandemic situation.

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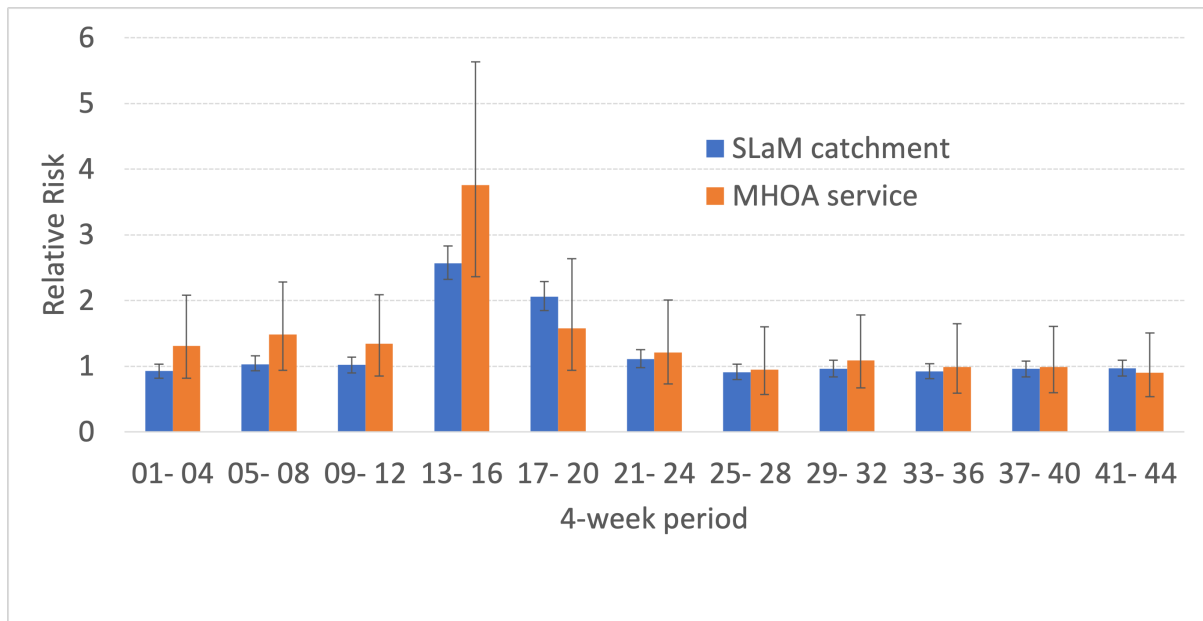
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Figure 1: Relative risk of deaths in 2020 compared with year 2019 in 4-weekly intervals in MHOA service users and the catchment area general population



MHOA = Mental Health of Older Adults

SLaM catchment = geographical area receiving mental health and dementia care from South London and Maudsley NHS Foundation Trust