EFFECT OF SARS-COV-2 ON COGNITIVE AND BRAIN FUNCTION: FINDINGS FROM THE UK BIOBANK COVID-19 CASE CONTROL DATASET

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PREREGISTRATION POSTER

BACKGROUND

- 10-30% of non-hospitalized cases of SARS-CoV-2 infection are estimated to suffer from some Long Covid symptoms [1,2].
- Up to 50% of individuals with other Long Covid symptoms reported also having problems with memory, cognition or concentration [3,4-7].
- In most cases, multiple cognitive domains are affected, and symptoms last for less than 1 year [8].
- Effect on TMT and episodic memory tests found across multiple studies [8].
- Brain studies report reduced hippocampal volumes, structural abnormalities in grey and white matter, fronto-parietal hypometabolism and and changes in connectivity in rs-fMRI [8].

METHODS

Data:
UK Biobank Covid-19 case control dataset (N=2092, 51-83 years, 53% females)
Pre-pandemic control group (N=2360, 49-82 years, 49.9% females)

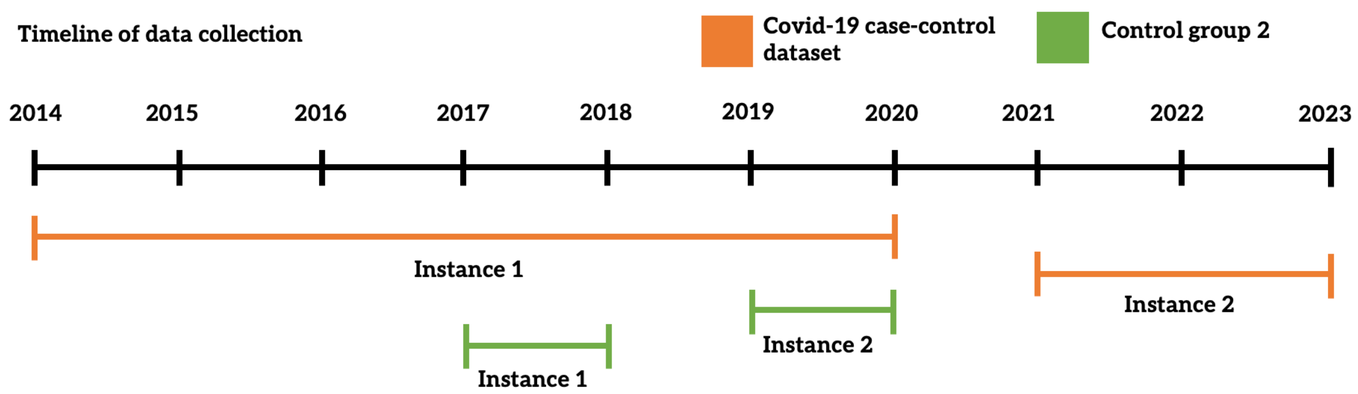
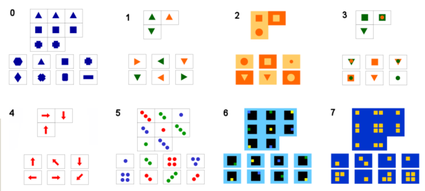
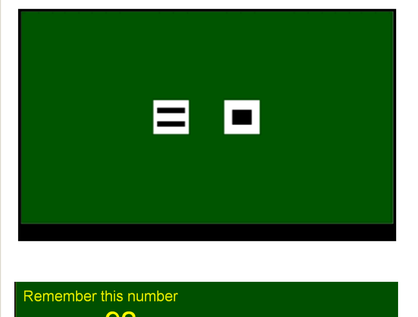


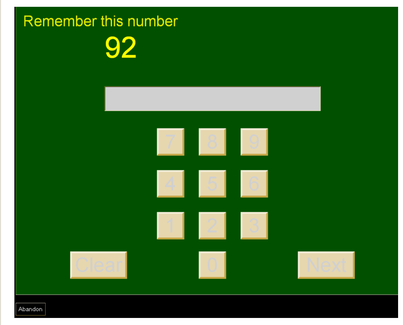
Figure 1 shows the timeline of data collection for the Covid-19 case-control dataset and the additional subsample from UK Biobank that will be used as the second control group.

Cognition:
- TMT A & B
- Associative memory test
- Fluid Intelligence test
- Numeric memory
- Reaction Time test
- Picture Vocabulary test
- Tower test
- Symbol digit test
- Matrix completion

Neuroimaging:
- MRI
- rs-fMRI







ANALYSIS PLAN

*Test 2 ~ Covid group * Test 1 + Age difference between Test2 and Test1 + Age difference between Test2 and Test1² + Age at Test 2 + Ethnicity + Sex + SES + Time since infection*

Previous study using a subset of the same dataset [9] found:
- Impairment on TMT A and B
- Reduction in grey matter thickness and tissue contrast in orbitofrontal cortex and parahippocampal gyrus
- Significant effect on global brain volume measures

Our aim is to replicate those findings and extend them to also include rs-fMRI measures.

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