

Objectives

- Compare patterns of multimorbidity in an NHS memory clinic population (**Oxford Brain Health Clinic - OBHC¹**) to a large cohort study (**UK Biobank - UKB**)
- Investigate interactions between vascular risk factors and multimodal magnetic resonance imaging (MRI) and cognitive markers of brain health

Introduction

- Multimorbidity, defined as the co-occurrence of 2+ long-term conditions (LTCs), is associated with increased dementia risk, especially during critical age windows.²
- Co-occurring LTCs have been linked to structural neuroimaging including differences in hippocampal and white matter hyperintensity (WMH) volumes.
- However, many of these studies have been done in populations without cognitive impairment rather than a real-world memory clinic population.

Methods

- 40 LTCs were prioritised based on established comorbidity lists and extracted from primary & secondary care records for OBHC patients and from available corresponding health records for UKB participants aged ≥ 65 (**1** – **2**).
- Multimorbidity clusters in predefined age windows were derived in UKB using multiple correspondence analysis then k-means clustering (k=5; **3**).
 - OBHC patients were subsequently mapped onto these clusters.
- Multimodal MRI was processed using a UKB-aligned pipeline optimised for memory clinic data,³ generating over 5600 imaging-derived phenotypes (IDPs) [N=317 OBHC patients; N=218 with LTCs also available].
- Linear regression with ACE-III was performed with normalised IDPs and covariates of age, sex, & head size and hierarchical FDR correction across IDPs within subgroups:
 - Patients with vs without hypertension (**4**)
 - Patients with WMH burdens above vs below the normalised, deconfounded median burden (**5**)

