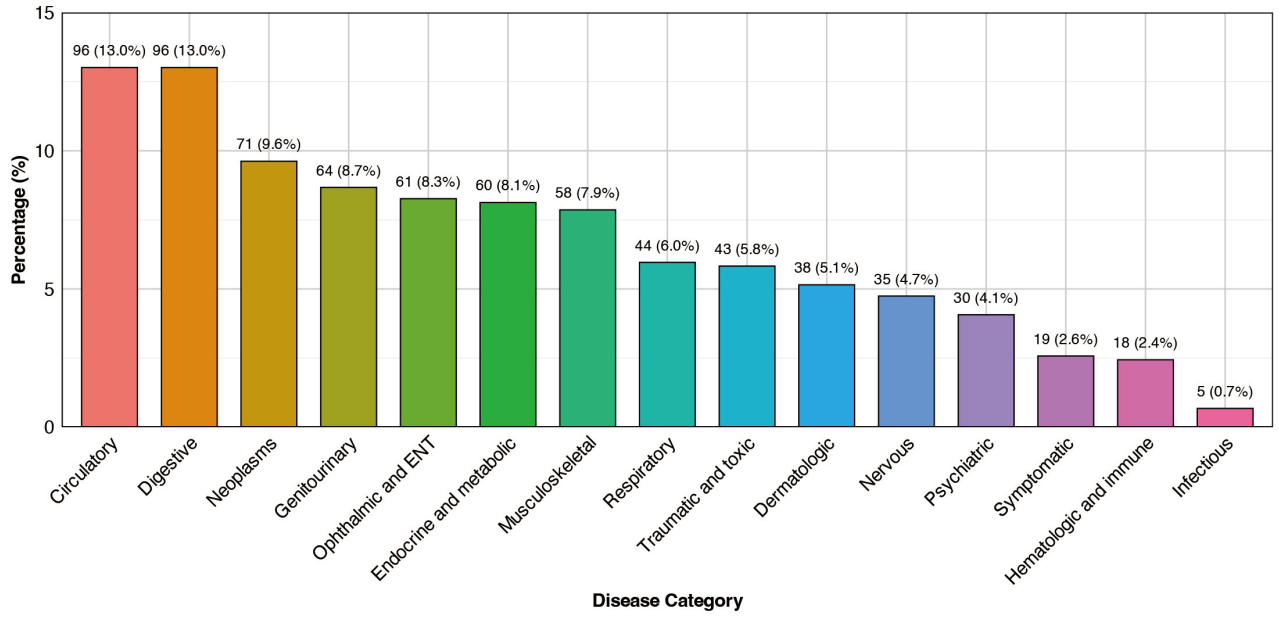
Extended Data Fig.1. Proportion and case distribution of disease groups

A



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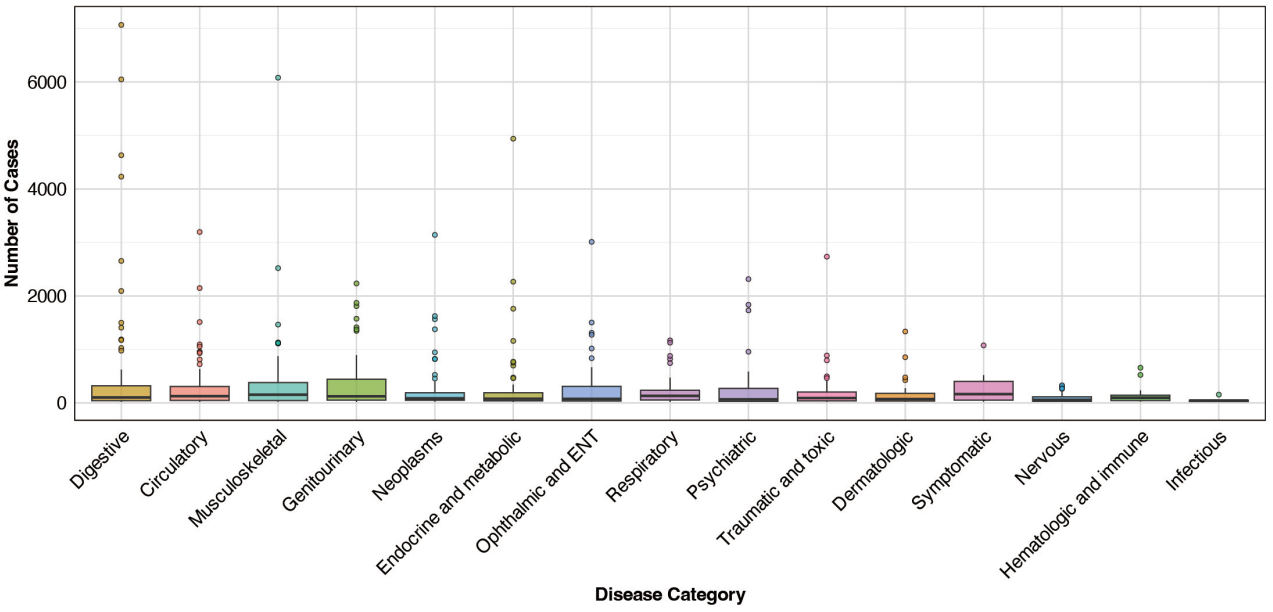
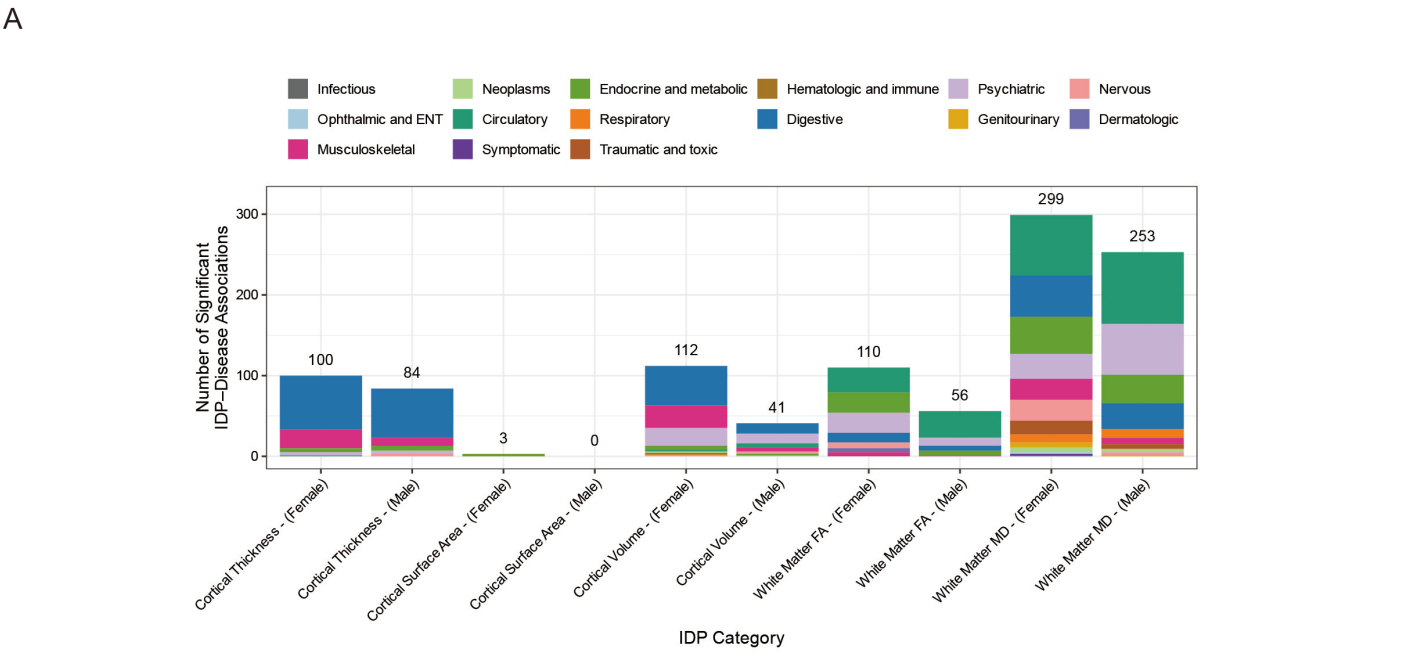
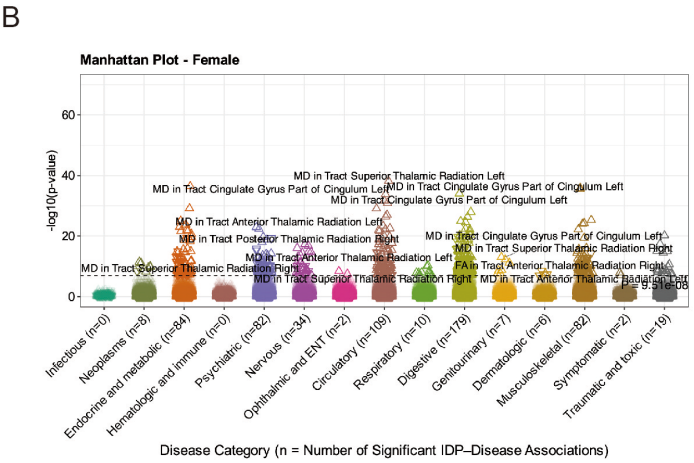


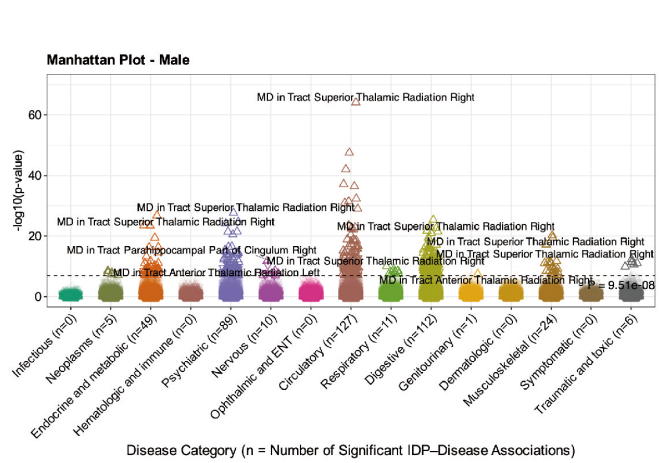
Extended Data Fig.1. Proportion and case distribution of disease categories

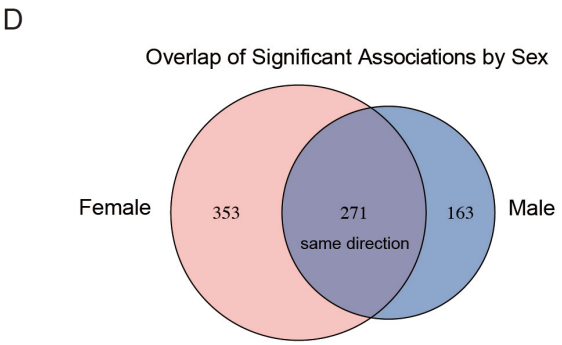
(A) Bar plots show the proportion of diseases across categories, with each bar representing the percentage and count of unique disease phenotypes within a category.
(B) Box plots display the distribution of case numbers across disease categories. Categories are ordered from left to right in descending order of total case counts.

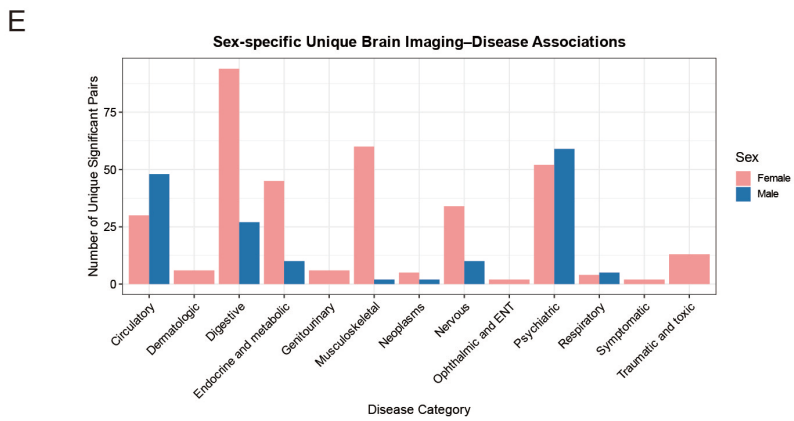
Extended Data Fig.2. Sex-specific patterns of brain imaging–disease associations









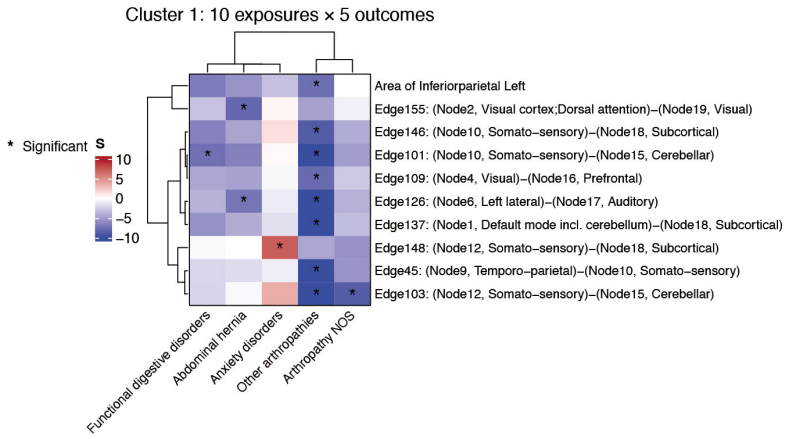


Extended Data Fig.2. Sex-specific patterns of brain imaging–disease associations

(A) Stacked bar plot showing the number of significant brain IDP–disease associations by IDP category, stratified by sex.
(B–C) Manhattan-style plots showing the distribution of significant IDP–disease associations in **(B)** females and **(C)** males across disease categories.
(D) Venn diagram illustrating the overlap of significant brain IDP–disease associations between sexes. The central intersection indicates associations observed in both sexes with effects in the same direction.
(E) Bar plot summarizing sex-specific unique associations by disease category.

Extended Data Fig.3. Subcluster-level associations between brain IDPs and diseases (Clusters 1 and 3)

A



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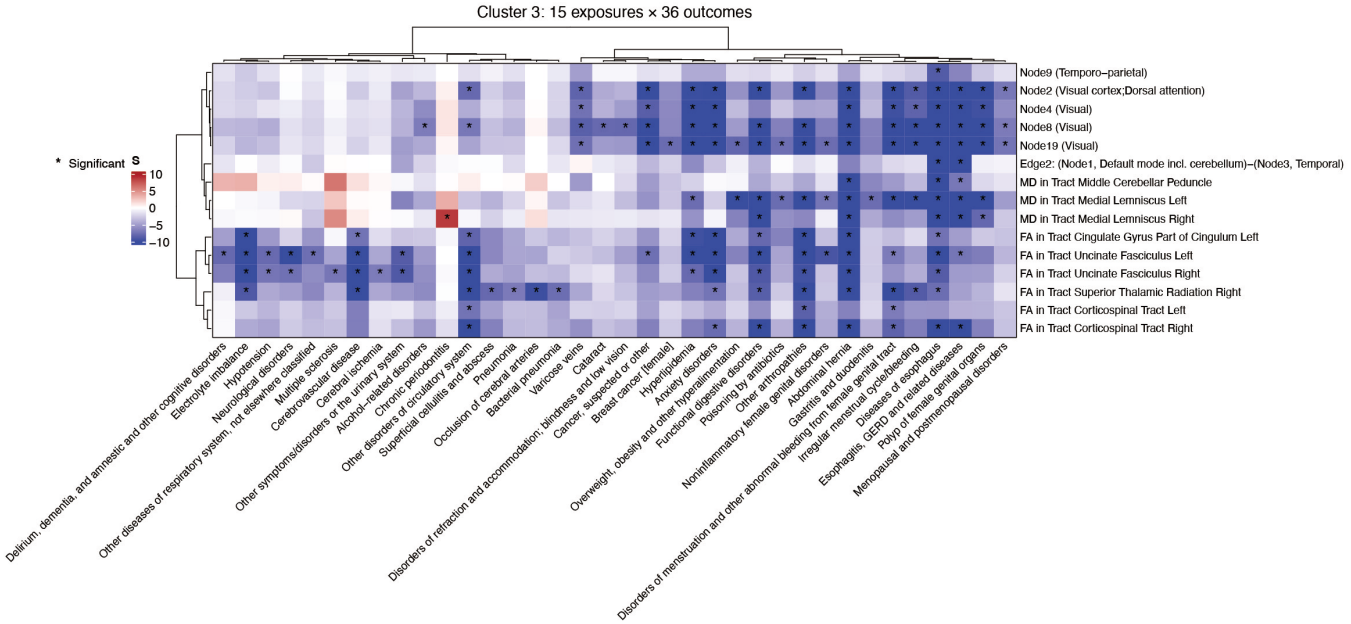
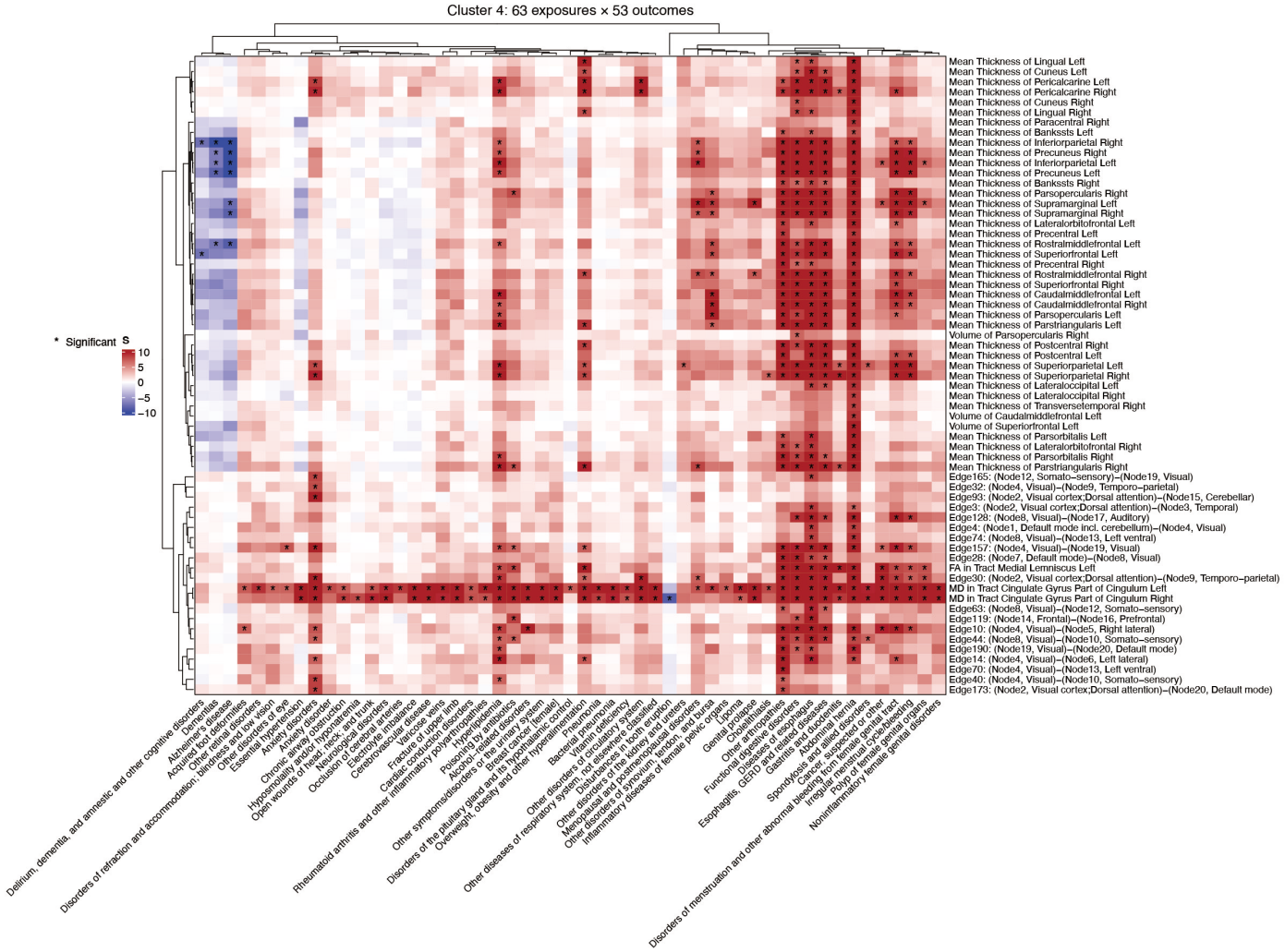


Extended Data Fig.3. Subcluster-level associations between brain IDPs and diseases (Clusters 1 and 3)

(A-B) Subclusters within brain IDP clusters **(A)** 1 and **(B)** 3 showing the associations between brain IDPs in each cluster and disease. Color indicates the direction and strength of associations, with red denoting higher IDP values associated with increased disease risk and blue denoting higher IDP values associated with decreased disease risk. Darker colors indicate smaller P values. * indicates statistically significant results.

Extended Data Fig.4. Subcluster-level associations between brain IDPs and diseases (Clusters 4 and 5)

A



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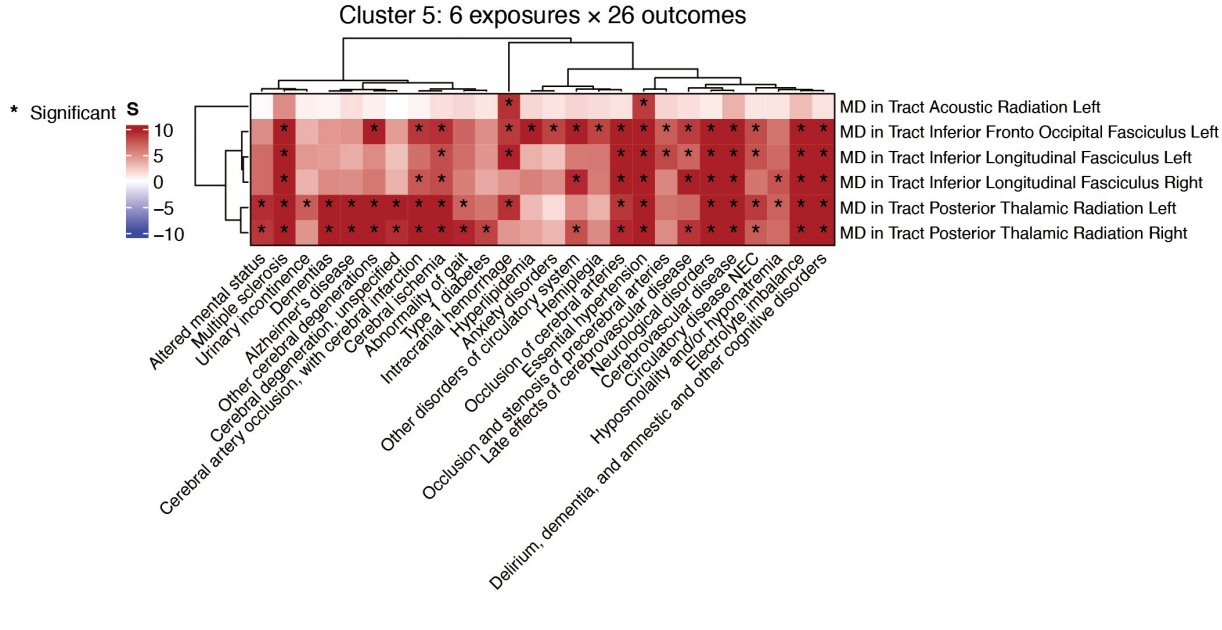
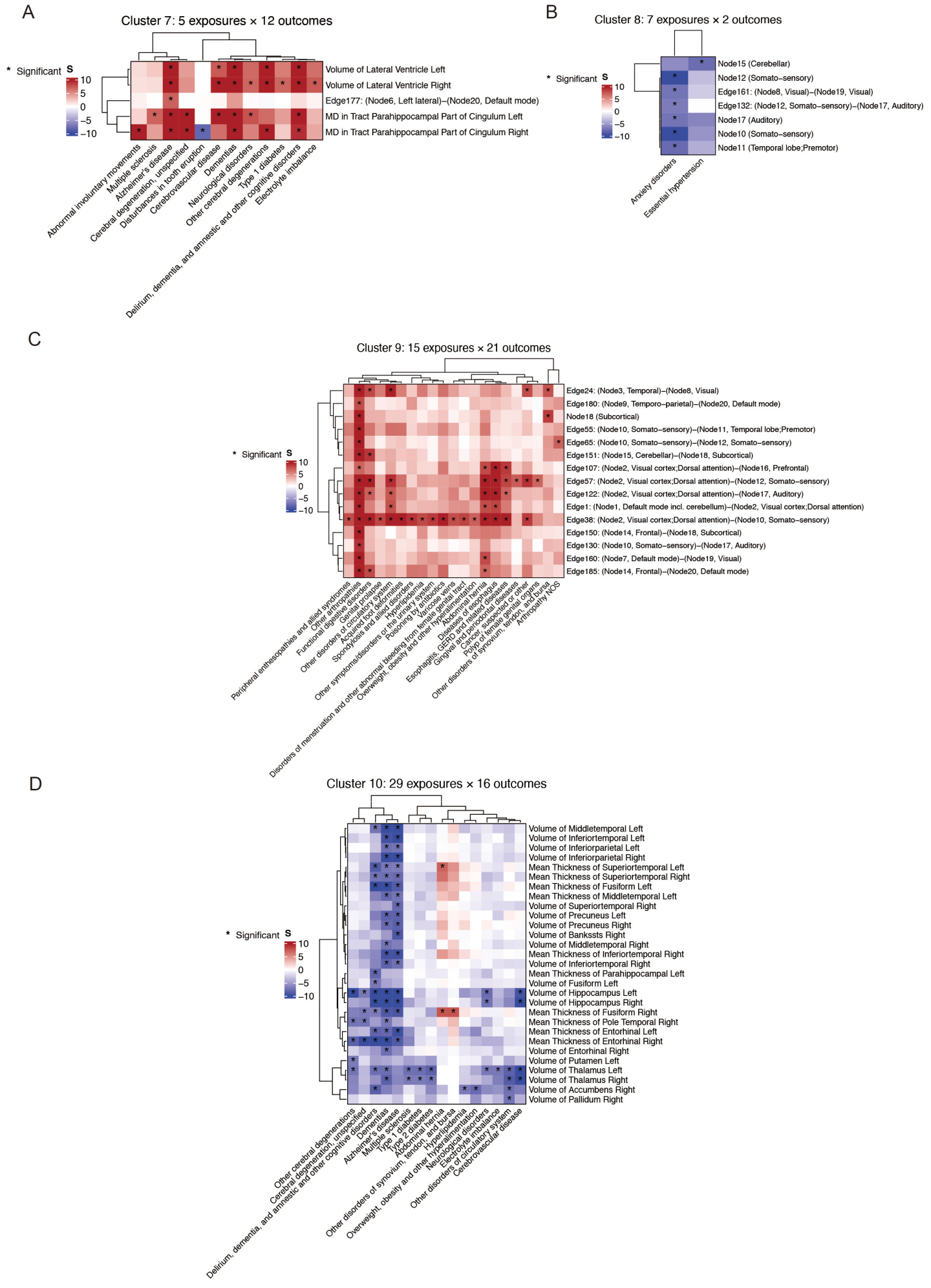


Extended Data Fig.4. Subcluster-level associations between brain IDPs and diseases (Clusters 4 and 5)

(A-D) Subclusters within brain IDP clusters **(A)** 4, and **(B)** 5 showing the associations between brain IDPs in each cluster and disease. Color indicates the direction and strength of associations, with red denoting higher IDP values associated with increased disease risk and blue denoting higher IDP values associated with decreased disease risk. Darker colors indicate smaller P values. * indicates statistically significant results.

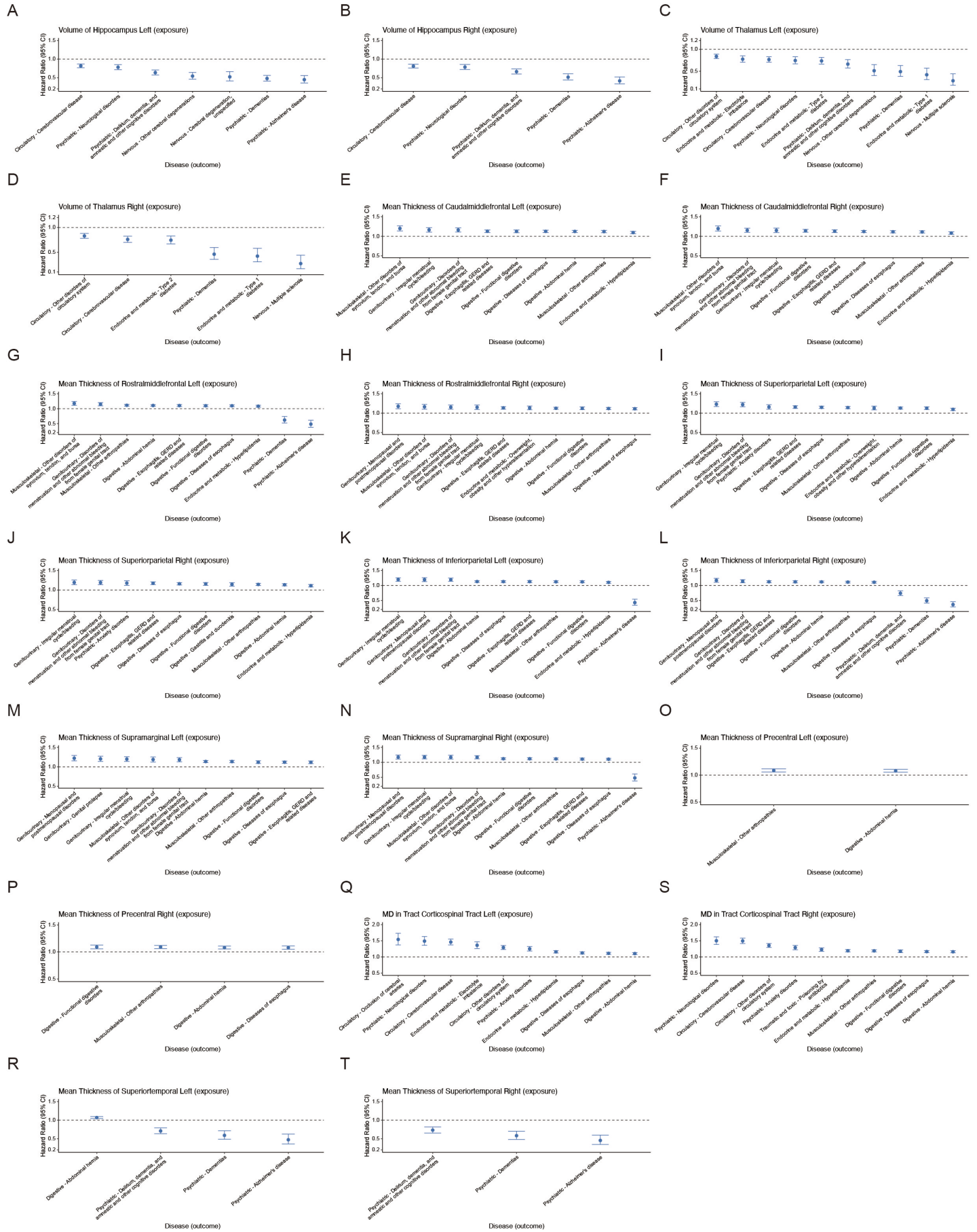
Extended Data Fig.5. Subcluster-level associations between brain IDPs and diseases (Clusters 7 to 10)



Extended Data Fig.5. Subcluster-level associations between brain IDPs and diseases (Clusters 7 to 10)

(A-B) Subclusters within brain IDP clusters **(A)** 7, **(B)** 8, **(C)** 9, and **(D)** 10 showing the associations between brain IDPs in each cluster and disease. Color indicates the direction and strength of associations, with red denoting higher IDP values associated with increased disease risk and blue denoting higher IDP values associated with decreased disease risk. Darker colors indicate smaller P values. * indicates statistically significant results.

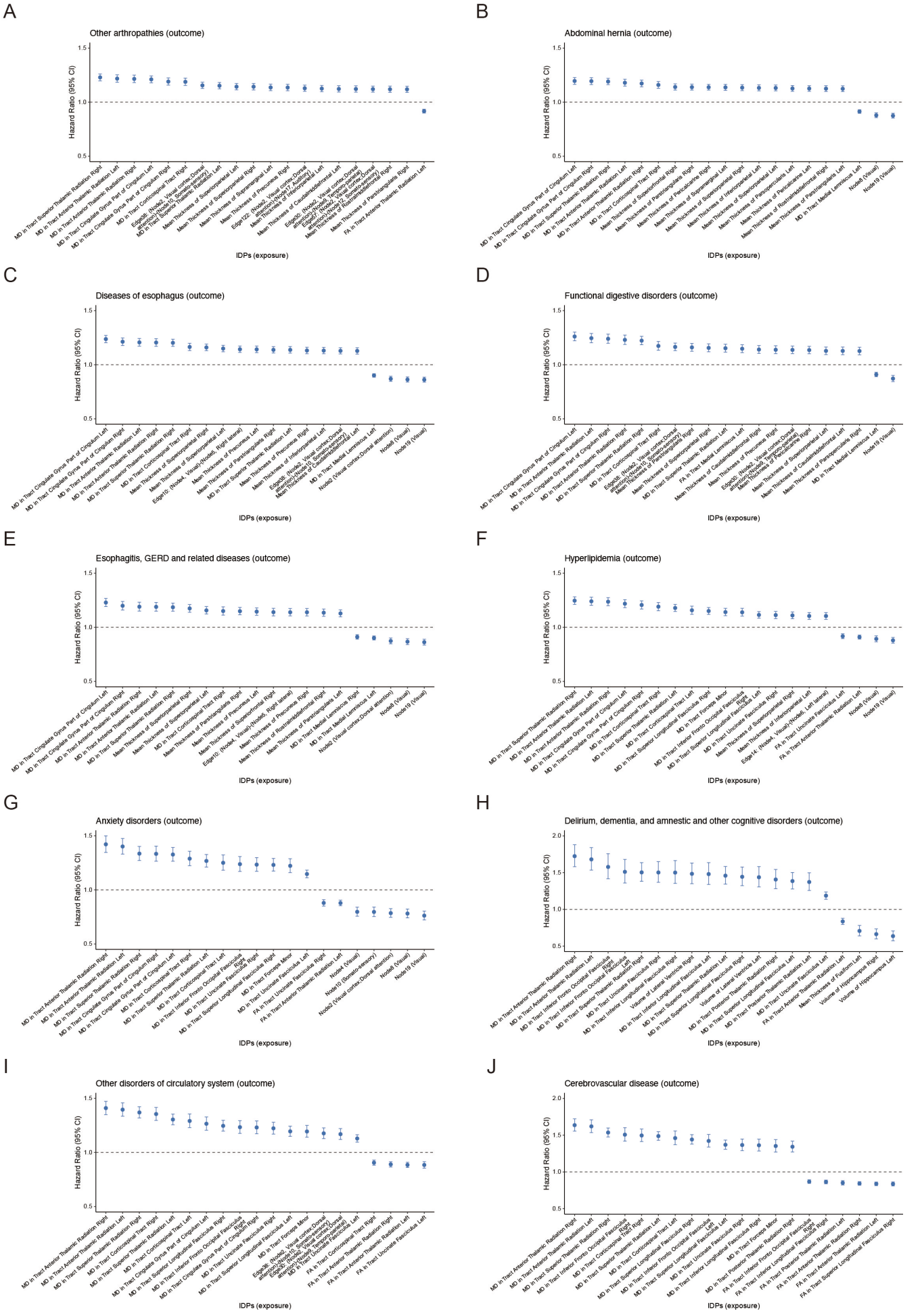
Extended Data Fig.6. Associations between clinically relevant brain stimulation targets and diseases



Extended Data Fig.6. Associations between clinically relevant brain stimulation targets and diseases

Forest plots show the brain IDP–disease associations with the most pronounced effect sizes (up to ten) in clinically relevant brain stimulation targets, reporting hazard ratios (HRs) and 95% confidence intervals (CIs) from Cox proportional hazards models.
(A–B) IDP–disease associations involving the hippocampus, including left and right hippocampal volumes.
(C–D) IDP–disease associations involving the thalamus, including left and right thalamic volumes.
(E–H) IDP–disease associations involving the dorsolateral prefrontal cortex (DLPFC), including cortical thickness of the left and right caudal middle frontal and rostral middle frontal regions.
(I–N) IDP–disease associations involving the posterior parietal cortex (PPC), including cortical thickness of the left and right superior parietal, inferior parietal, and supramarginal regions.
(O–S) IDP–disease associations involving the primary motor cortex (M1), including cortical thickness of the left and right precentral regions and MD in the left and right corticospinal tracts.
(R–T) IDP–disease associations involving the superior temporal gyrus (STG), including cortical thickness of the left and right superior temporal regions.

Extended Data Fig.7. Brain IDP associations of top 10 high-degree diseases



Extended Data Fig.7. Brain IDP associations of top 10 high-degree diseases

Forest plots show the most pronounced (up to 20) brain IDP–disease associations ranked by effect size for the ten diseases with the highest network degree in the phenome-wide analysis. Each plot reports hazard ratios (HRs) and 95% confidence intervals (CIs) from Cox proportional hazards models.
(A–J) The ten diseases are: **(A)** other arthropathies, **(B)** abdominal hernia, **(C)** diseases of the esophagus, **(D)** functional digestive disorders, **(E)** esophagitis and GERD-related diseases, **(F)** hyperlipidemia, **(G)** anxiety disorders, **(H)** delirium, dementia, and other cognitive disorders, **(I)** other circulatory system disorders, and **(J)** cerebrovascular disease.