Supplementary Materials

1. Description of reference labels

The public validation datasets included different sets of ROI label definitions, with 3 ROIs in BrainWeb, 32 ROIs in IBSR, 33 ROIs in NIREP and 14 ROIs in OASIS. Figure 1 illustrates the reference ROI labels in each dataset.
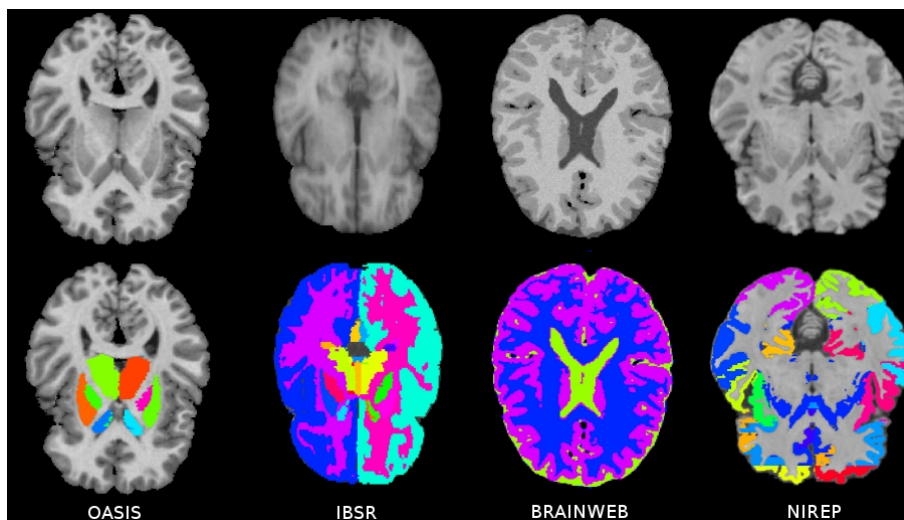

Figure 1: Illustration of ROI definitions in public validation datasets.

2. Application of MUSE on a multi-site dataset

For each subject of the pooled multi-site dataset ROI segmentation was performed by applying independently MUSE, STAPLE and Joint Label Fusion using 11 atlases selected from the set of 35 OASIS atlases with reference labels. Scatter plots of ROI volumes of all subjects for lateral ventricles (VN), hippocampus, posterior cingulate gyri and superior frontal gyri, as well as for total GM and WM volumes calculated from MUSE ROI's are shown in figure 2. Figure 3 shows the GM, WM, VN and hippocampus volumes for ROIs segmented using the three methods.
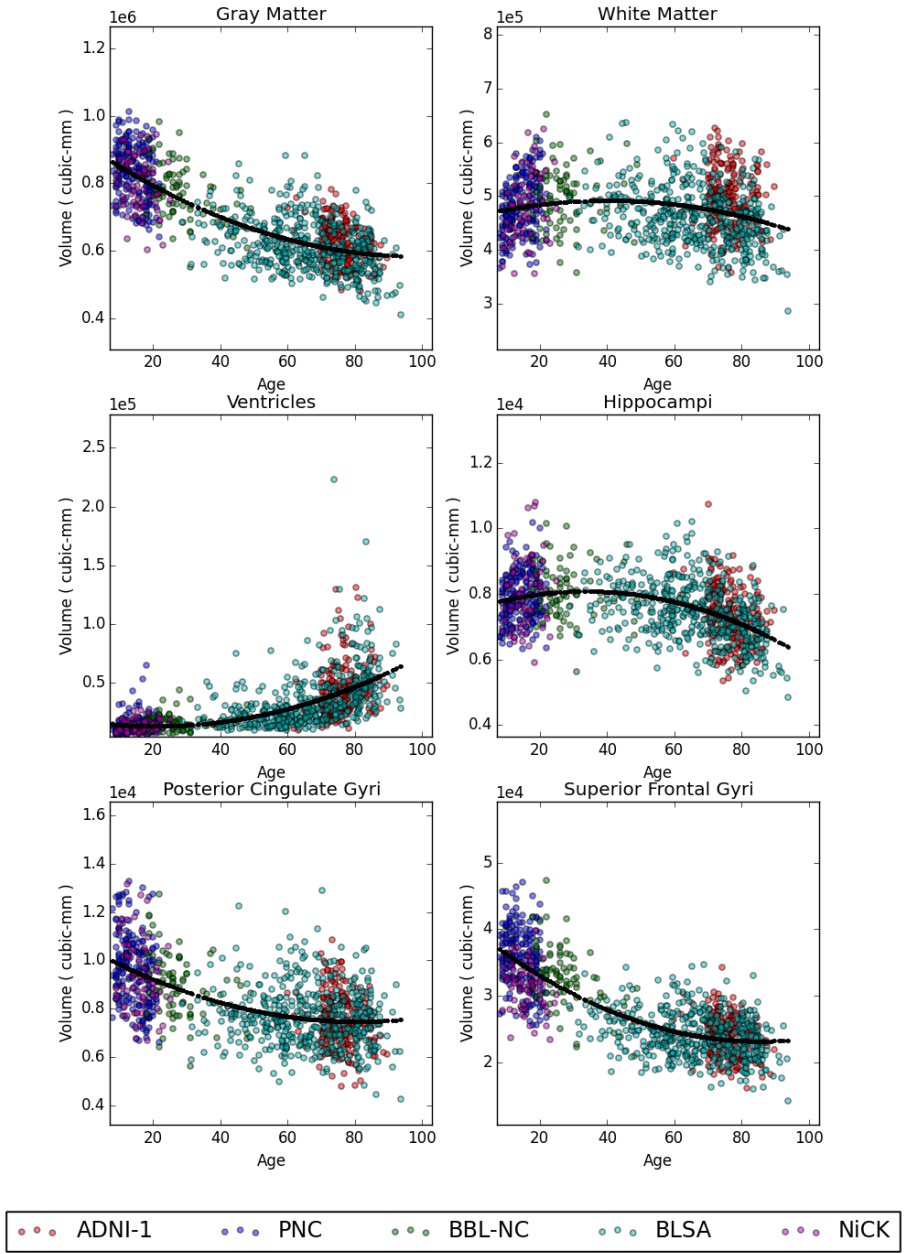
Figure 2: Scatter plots of ROI volumes for gray matter, white matter, ventricles, hippocampi, posterior cingulate gyri and superior frontal gyri for the multi-site dataset of healthy control subjects. ROI volumes were calculated using MUSE. The trend lines indicate second degree fits for each dataset.
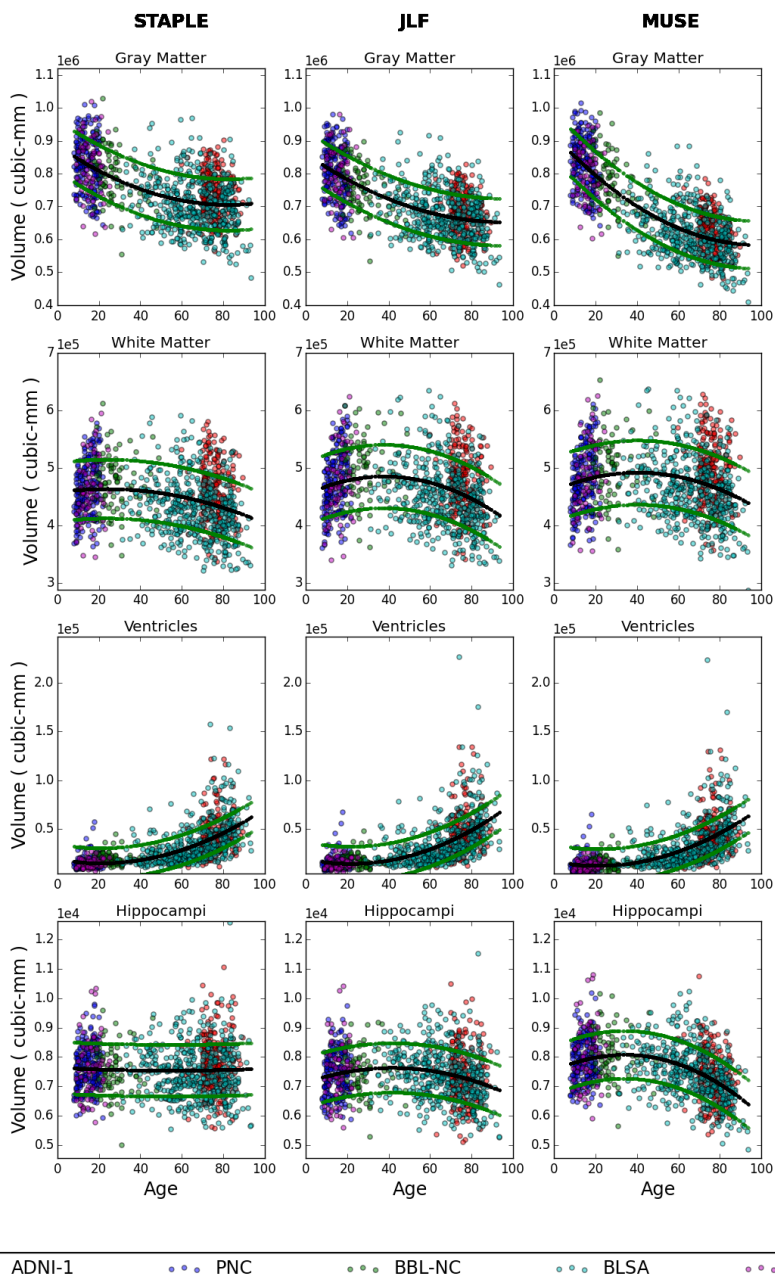
Figure 3: Scatter plots of ROI volumes for gray matter, white matter, ventricles and hippocampi for the multi-site dataset of healthy control subjects. ROI volumes were calculated independently using three different label fusion methods. The trend lines indicate second degree fits for each dataset. The error bar shows mean absolute error.

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