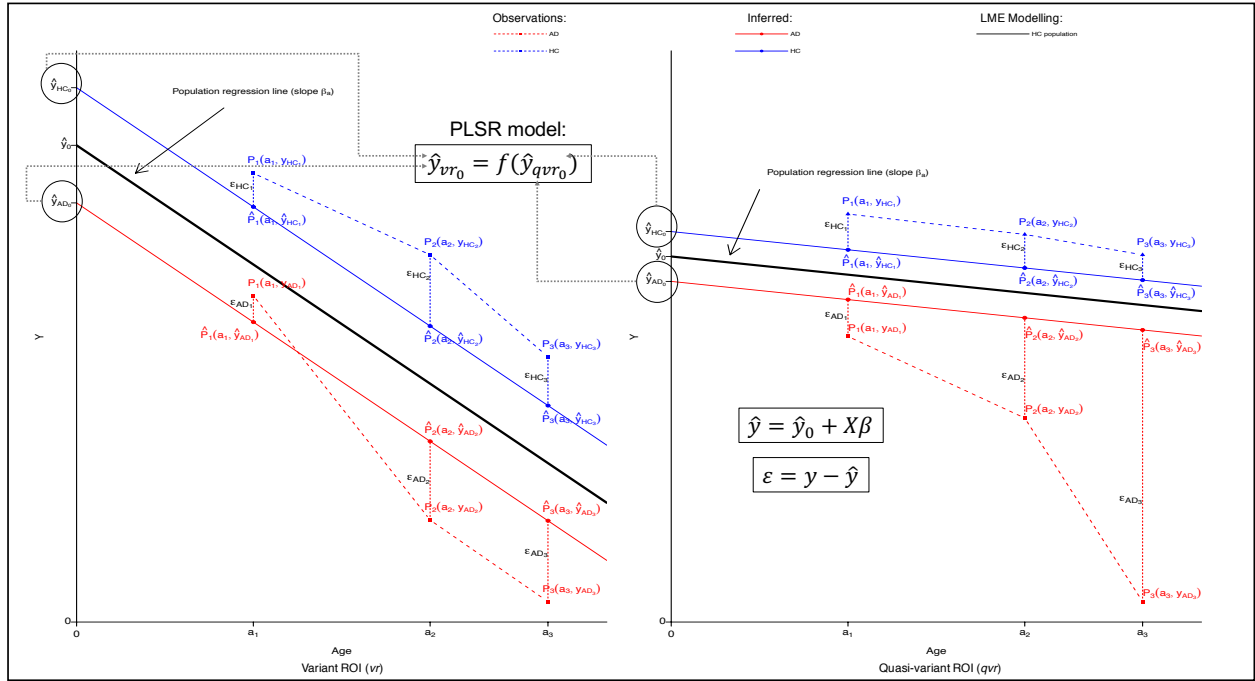


# S1 Fig.



**Fig 1. Example of LME modelling for hypothetical variant ( $vr$ ) and quasi-variant( $qvr$ ) ROIs.**

HC and AD are hypothetical subjects.  $P_1$ ,  $P_2$  and  $P_3$  are observations of each ROI  $y$  at three different ages ( $a_1$ ,  $a_2$  and  $a_3$ ). Black lines, healthy population regression line calculated from LME.  $\hat{y}_0$ , vertical y-intercept value of healthy population. Blue and red lines, individual regression lines estimated by assuming both as healthy. Points  $\hat{P}_1$ ,  $\hat{P}_2$  and  $\hat{P}_3$ , inferred  $\hat{y}$ 's for the three ages.  $\hat{y}_{HC_0}$  and  $\hat{y}_{AD_0}$ , the subject-specific y-intercepts estimated for HC and AD subjects, respectively.  $\hat{y}_{HC_0}$  and  $\hat{y}_{AD_0}$  of  $vr$  ROI are inferred from the  $\hat{y}_{HC_0}$  and  $\hat{y}_{AD_0}$  of  $qvr$  ROI through PLSR model.  $\beta_a$ , slope or rate change of the standard deviation of ROI per unit of age.  $\epsilon_{HC1}$ ,  $\epsilon_{HC2}$ ,  $\epsilon_{HC3}$ ,  $\epsilon_{AD1}$ ,  $\epsilon_{AD2}$  and  $\epsilon_{AD3}$ , the residuals of each observation with respect to the estimated individual regression lines.