

Supplementary Materials

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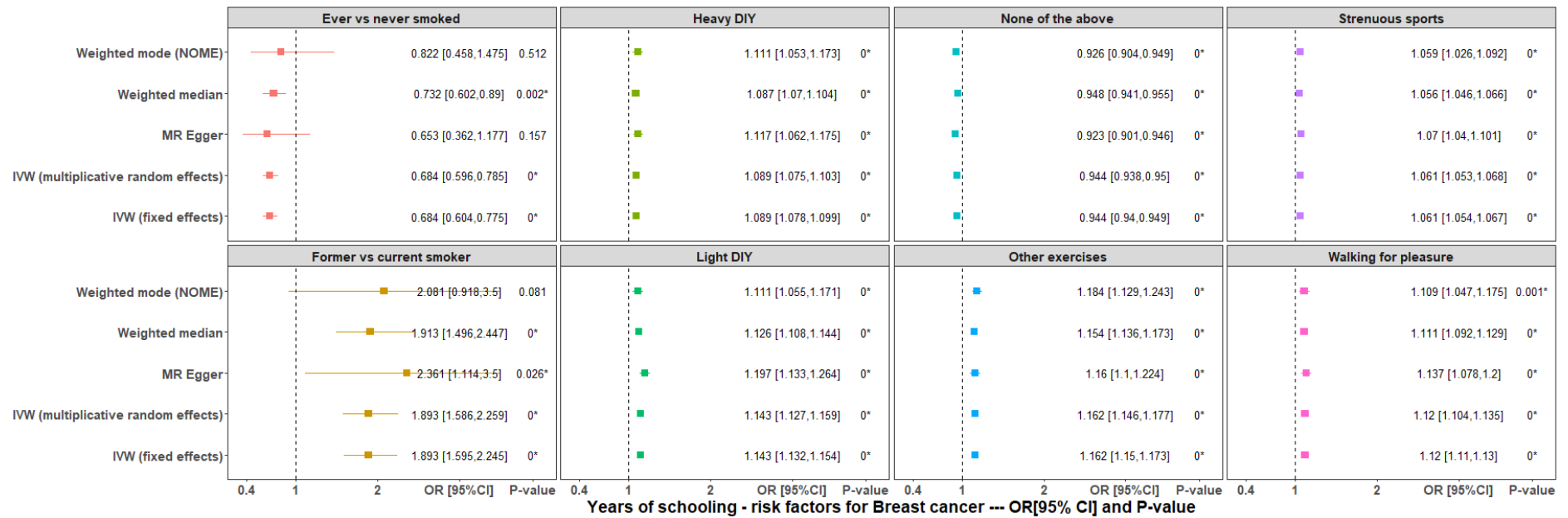


Fig.S1 Causal estimates of education on potential mediators (binary)

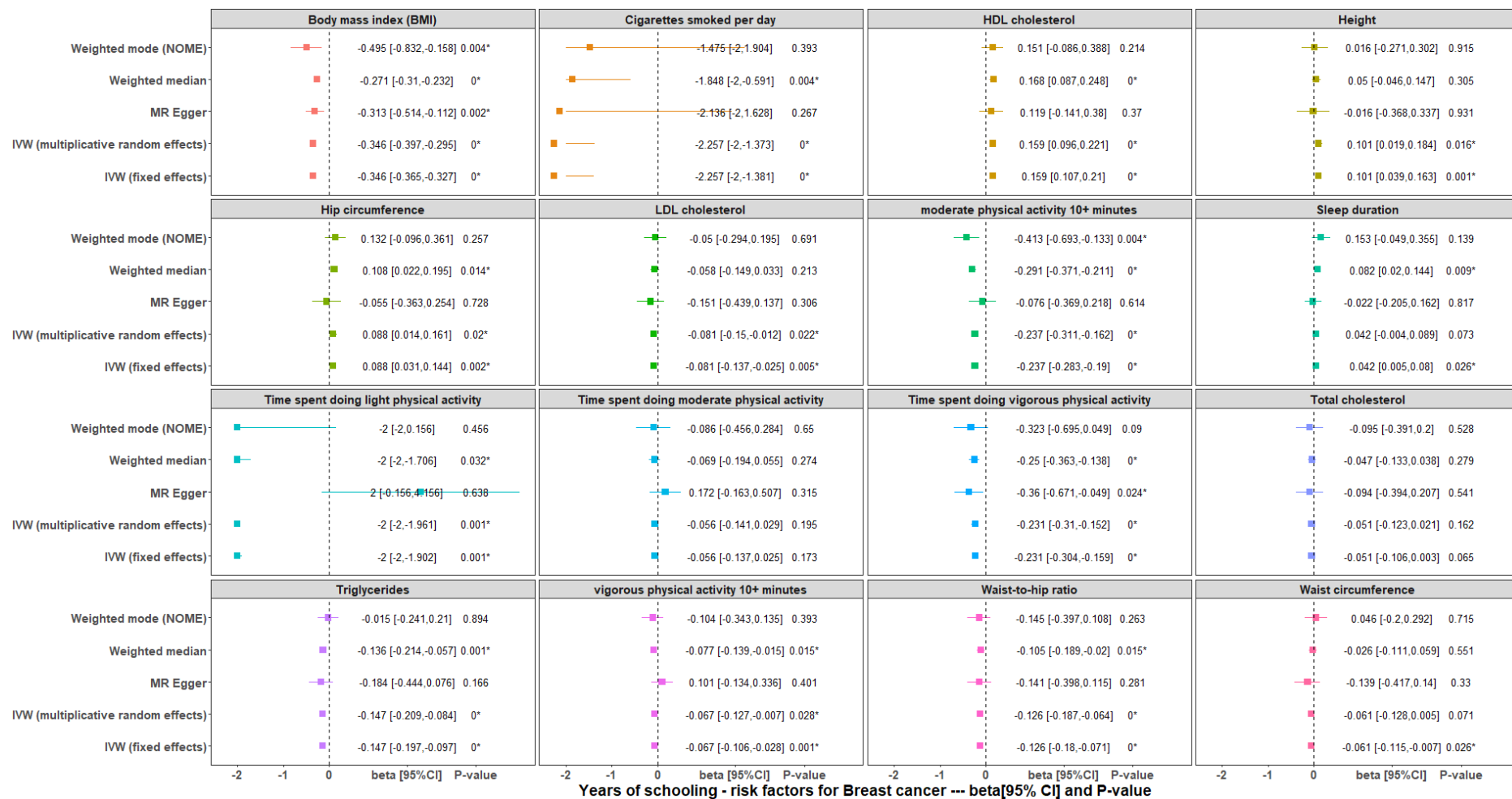


Fig.S2 Causal estimates of education on potential mediators (continue)

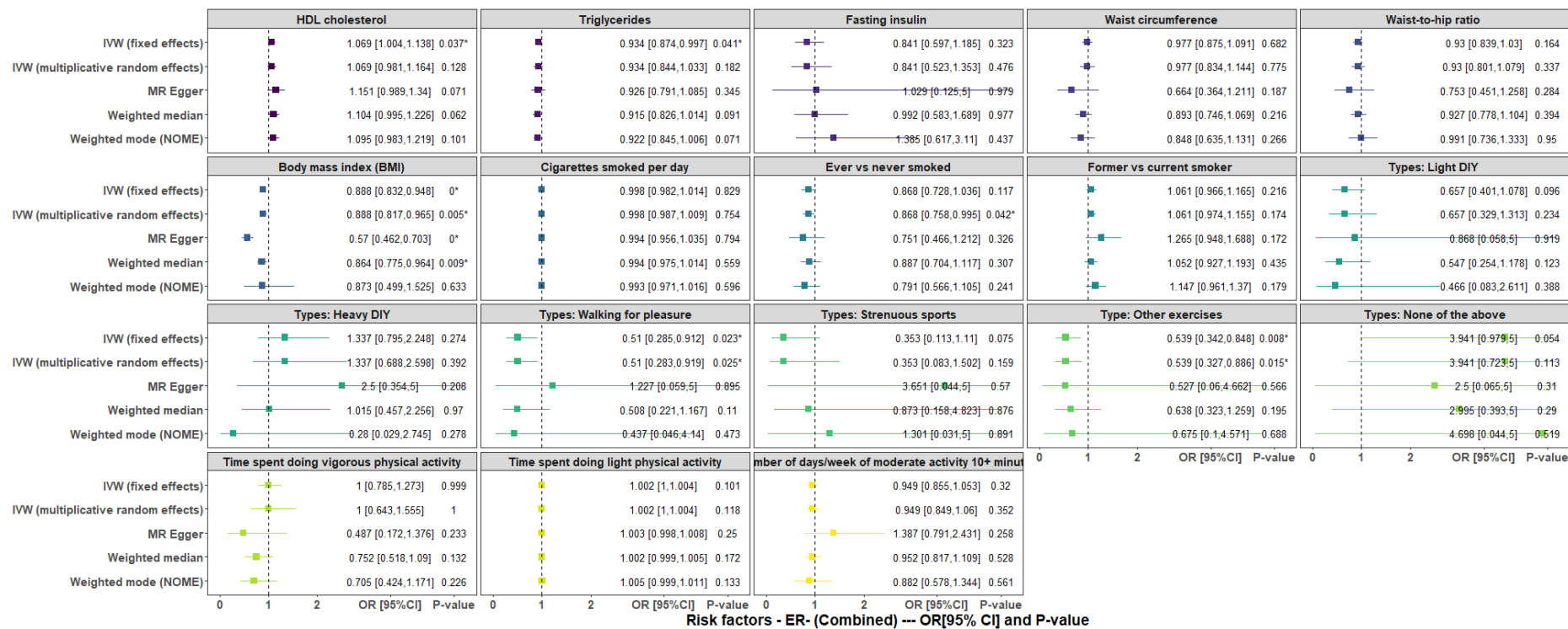


Fig.S3 Causal estimates of potential mediators on ER- (combined)

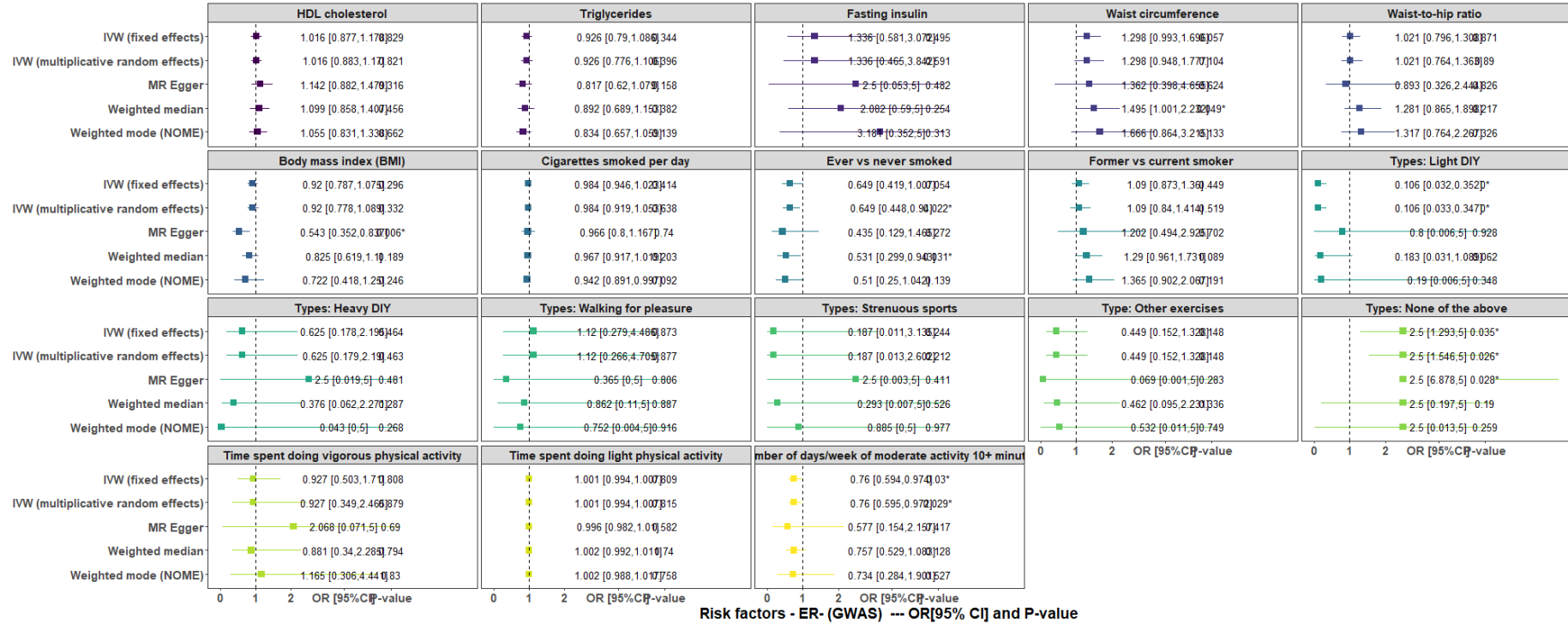


Fig.S4 Causal estimates of potential mediators on ER- (GWAS)

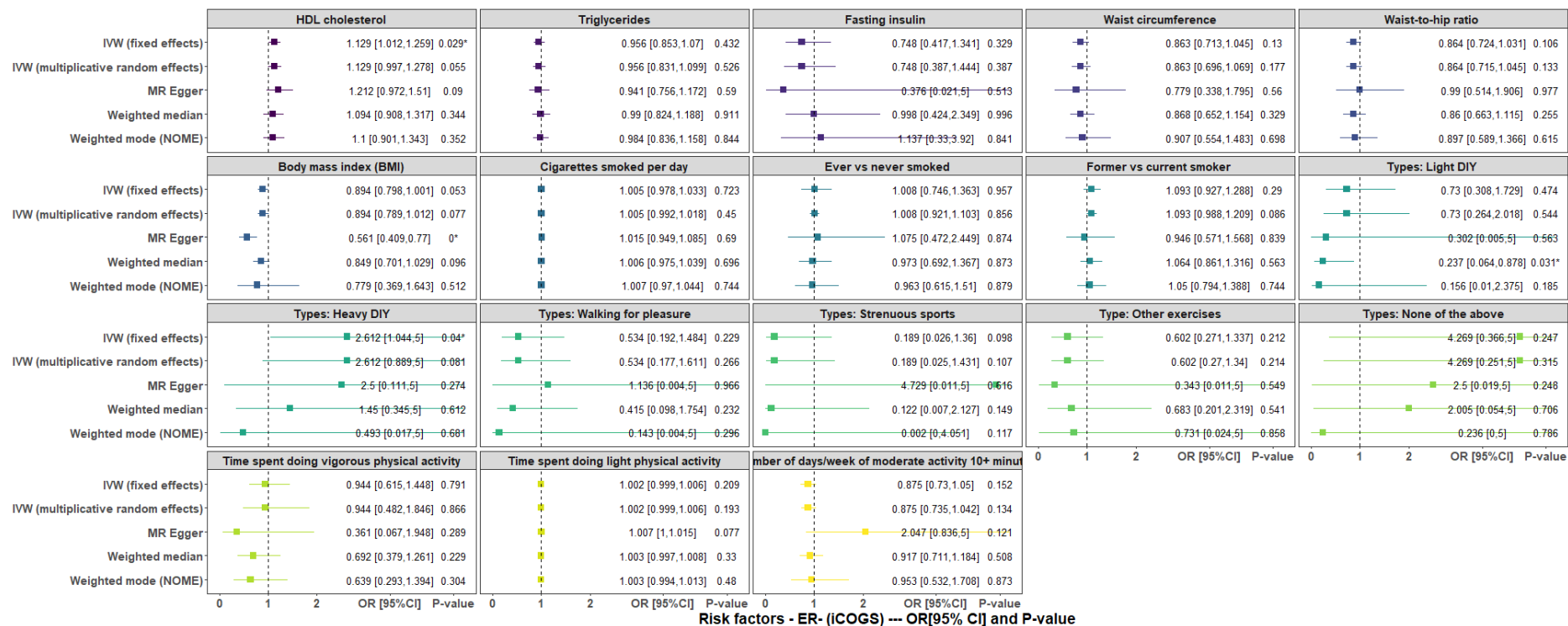


Fig.S5 Causal estimates of potential mediators on ER- (iCOGS)

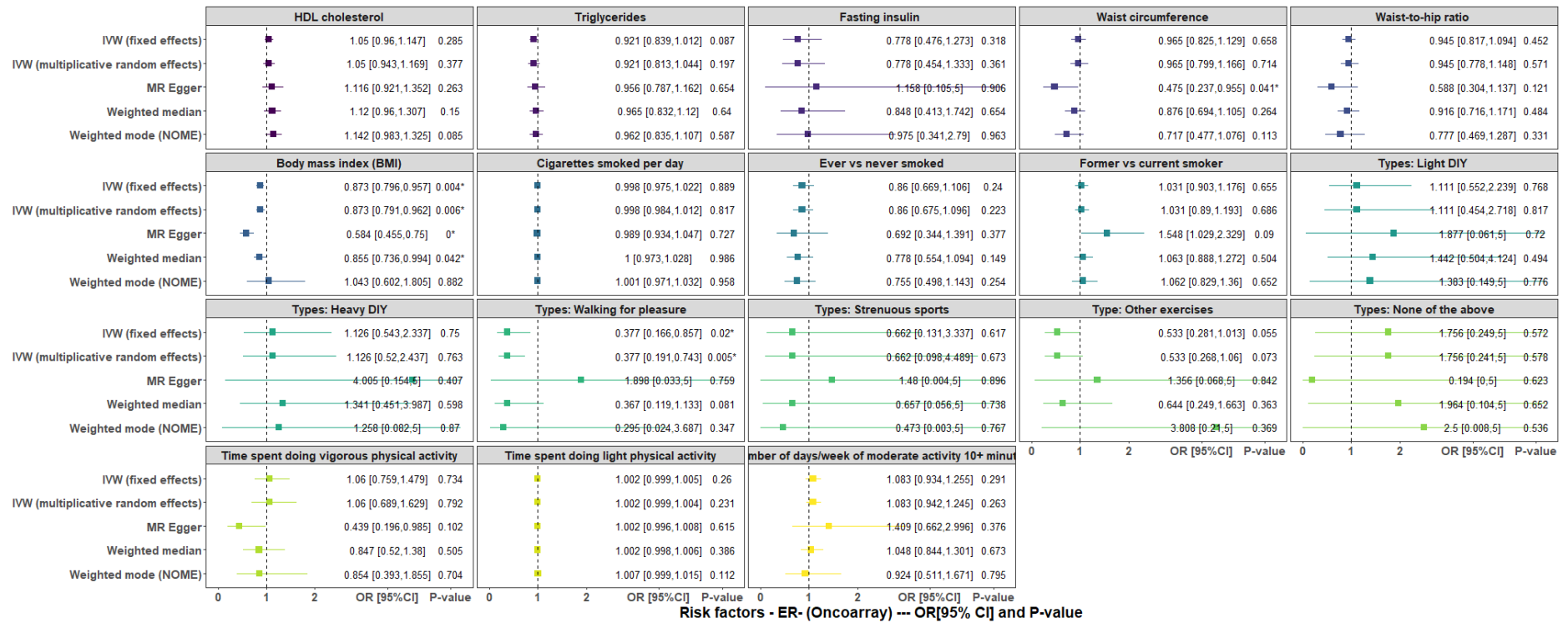


Fig.S6 Causal estimates of potential mediators on ER- (Oncoarray)

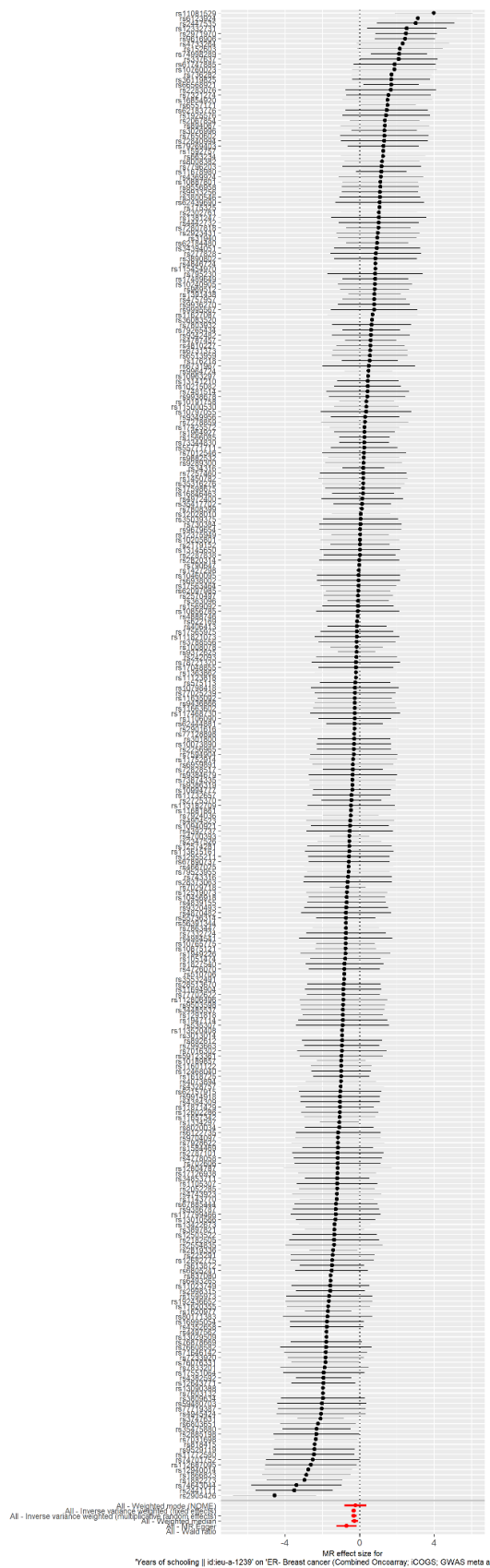


Fig.S7 Forest plot of SNPs associated with education and their risk of ER- (combined)

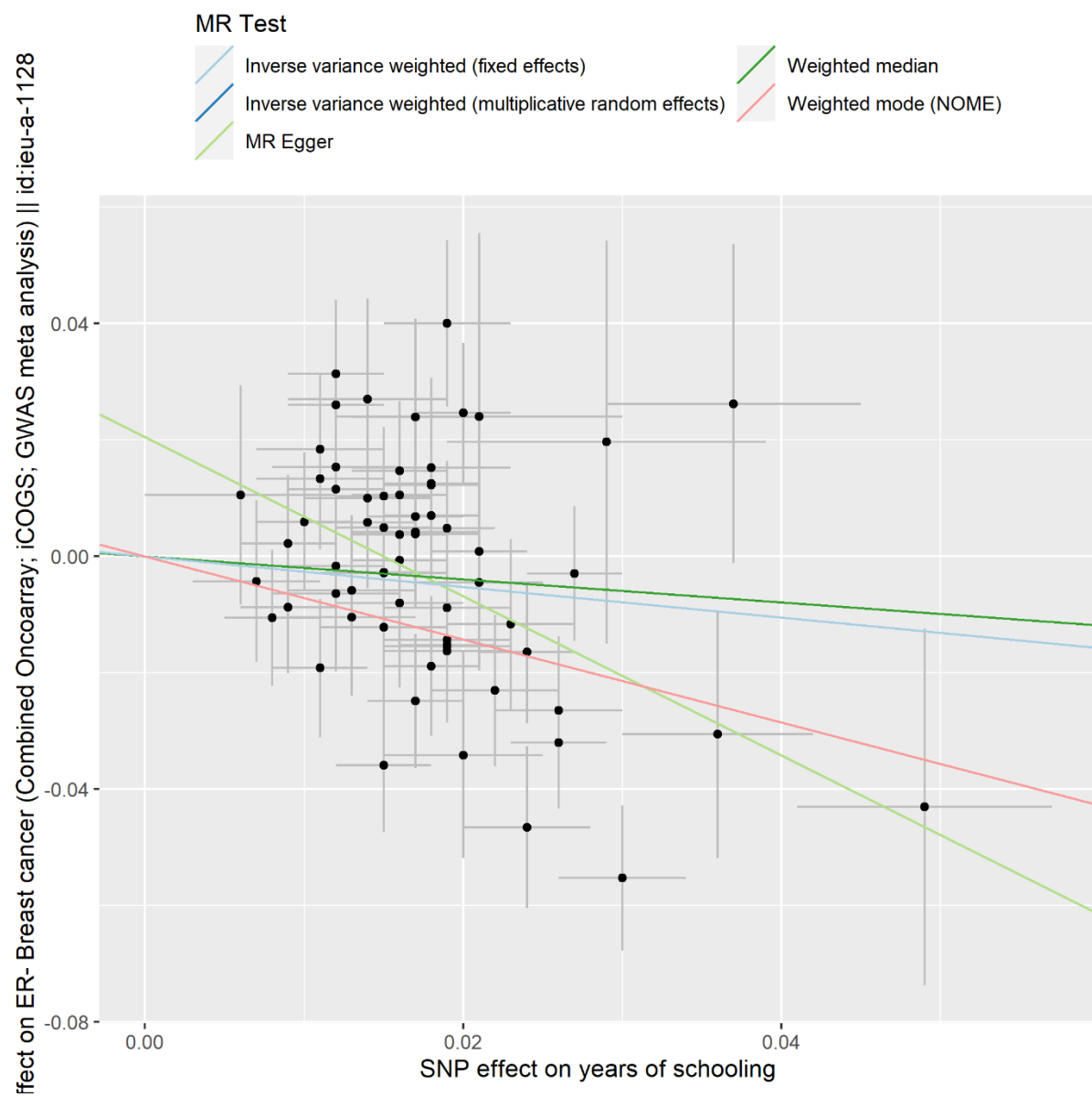
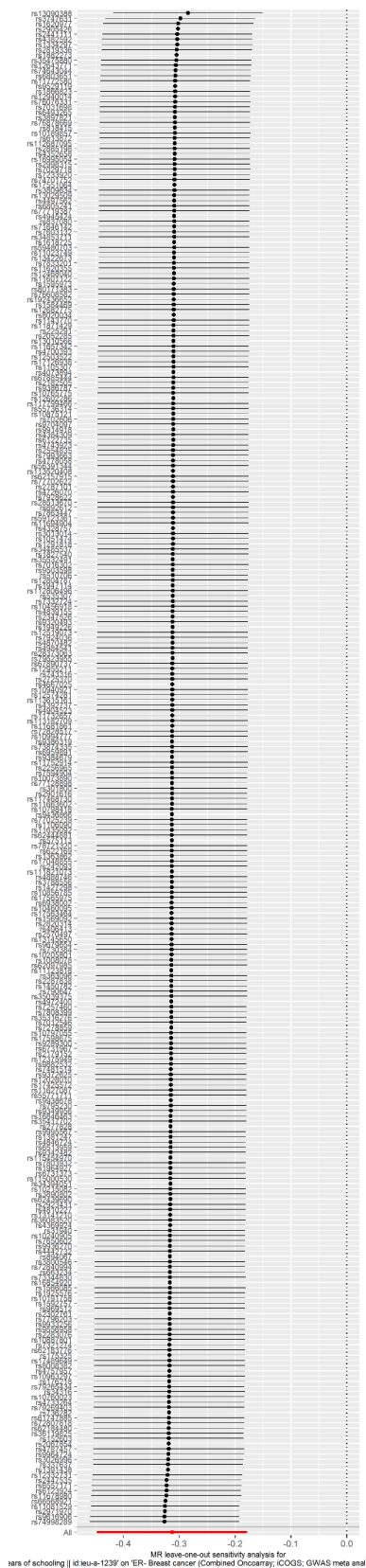


Fig.S8 Scatter plot of SNPs associated with education and their risk of ER- (combined)



**Fig.S9 Leave-one-out plot of SNPs associated with education and their risk of ER-
(combined)**

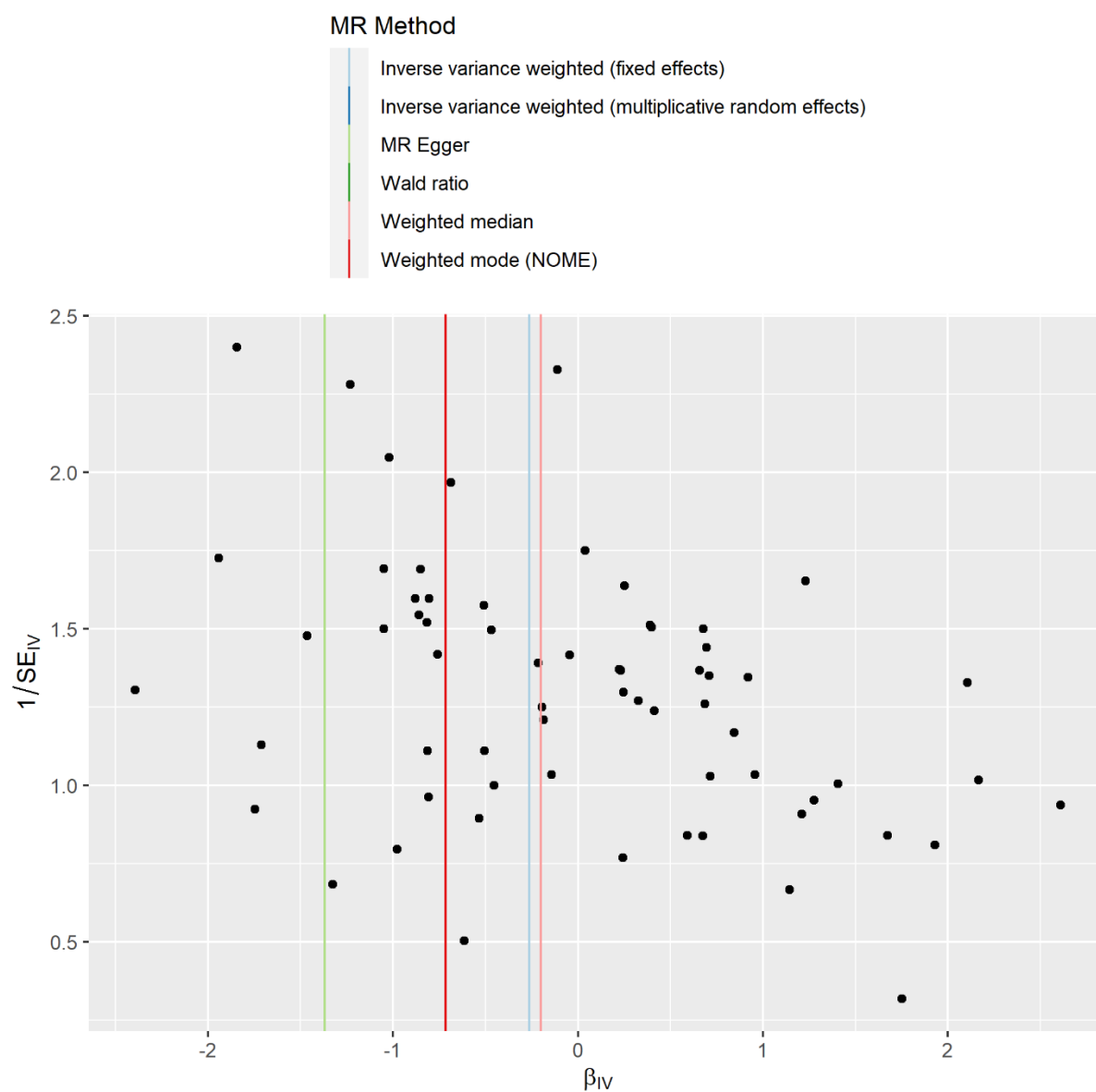


Fig.S10 Funnel plot of SNPs associated with education and their risk of ER- (combined)

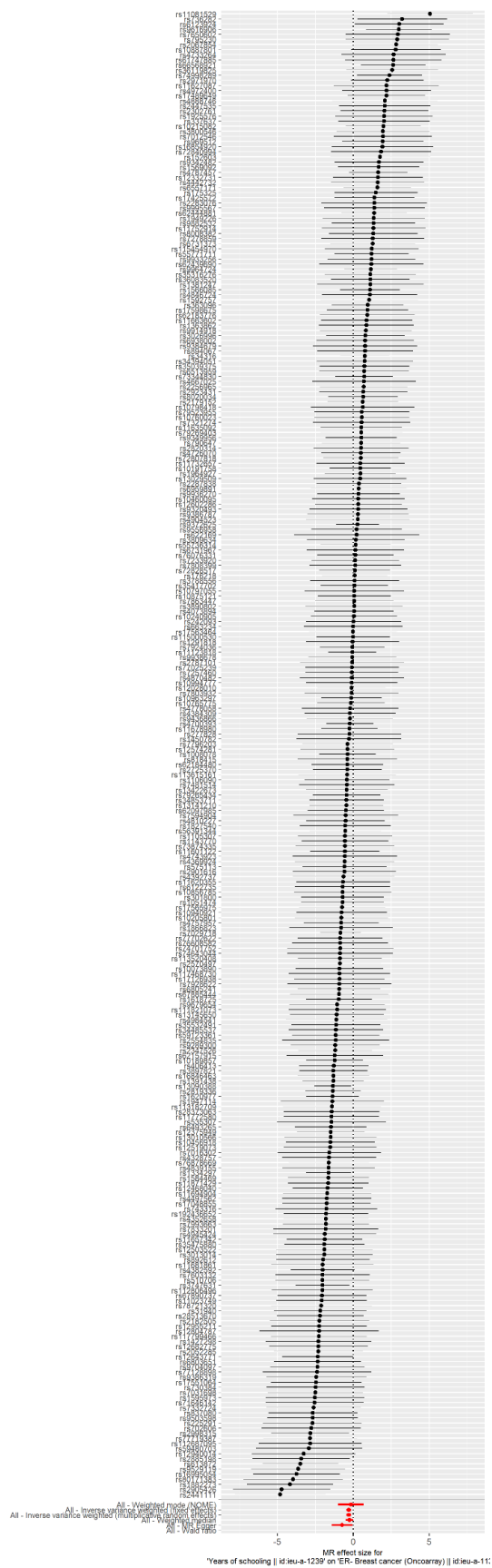


Fig.S11 Forest plot of SNPs associated with education and their risk of ER- (Oncoarray)

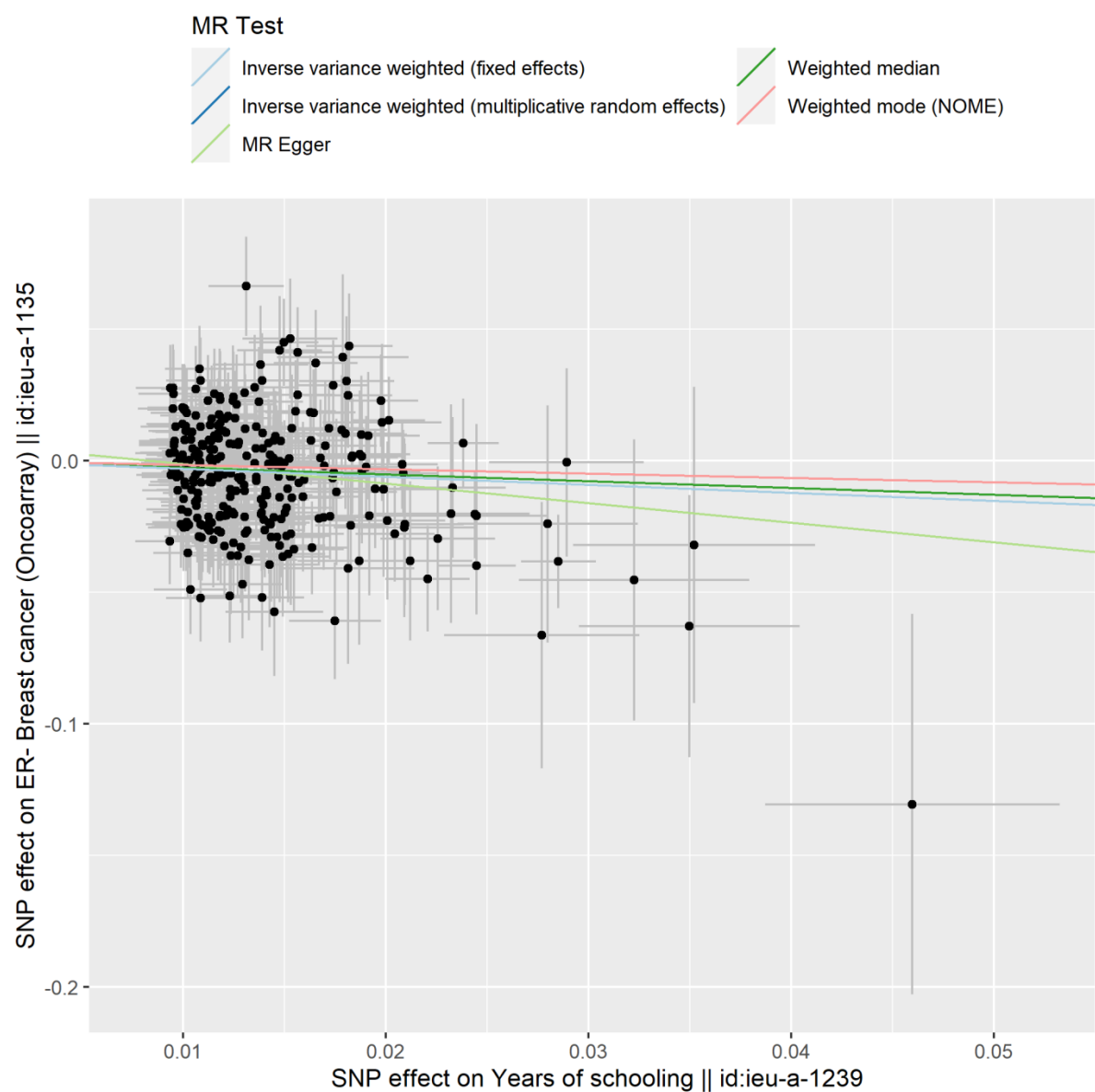
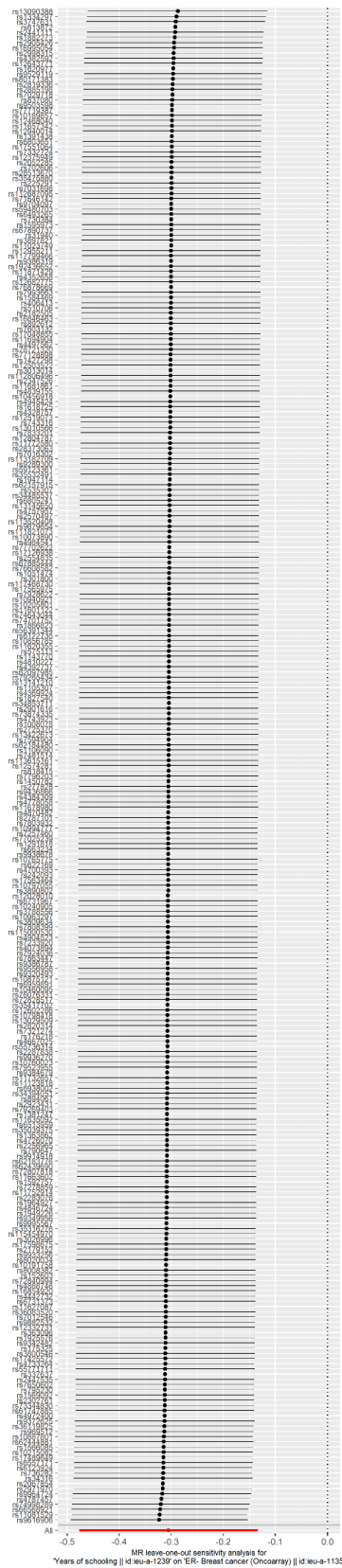


Fig.S12 Scatter plot of SNPs associated with education and their risk of ER- (Oncoarray)



**Fig.S13 Leave-one-out plot of SNPs associated with education and their risk of ER-
(Oncoarray)**

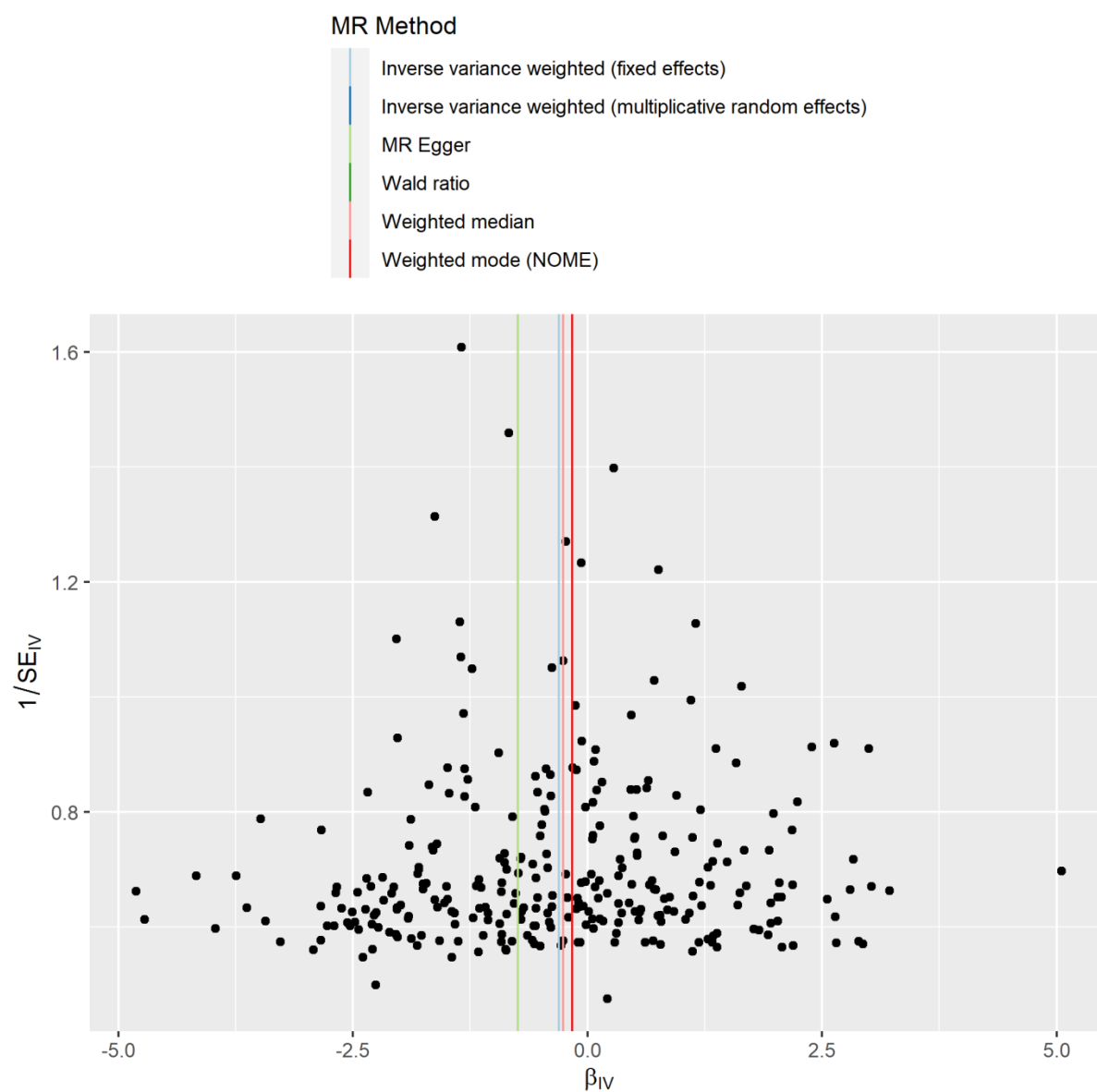


Fig.S14 Funnel plot of SNPs associated with education and their risk of ER- (Oncoarray)

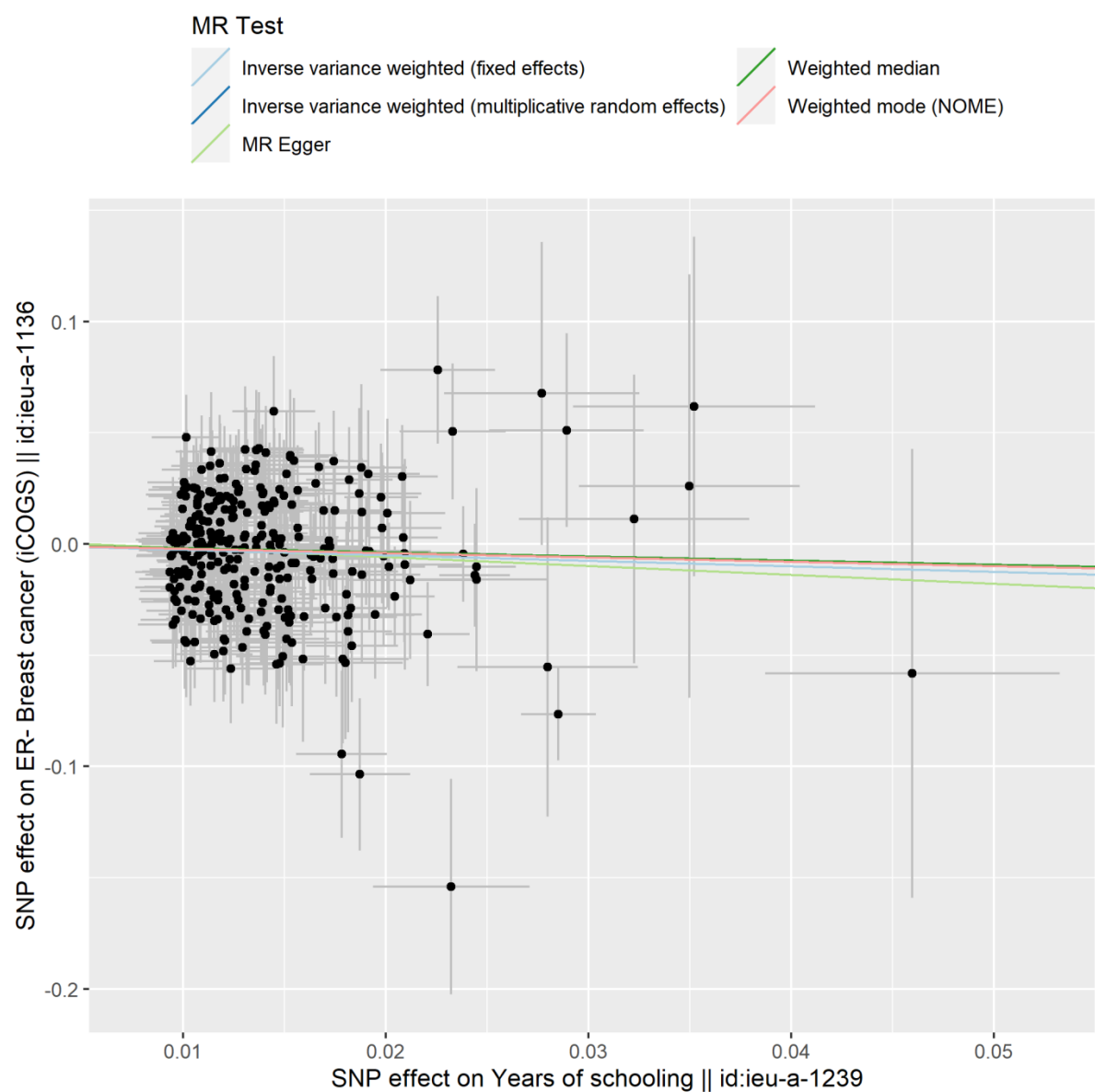


Fig.S16 Scatter plot of SNPs associated with education and their risk of ER- (iCOGS)

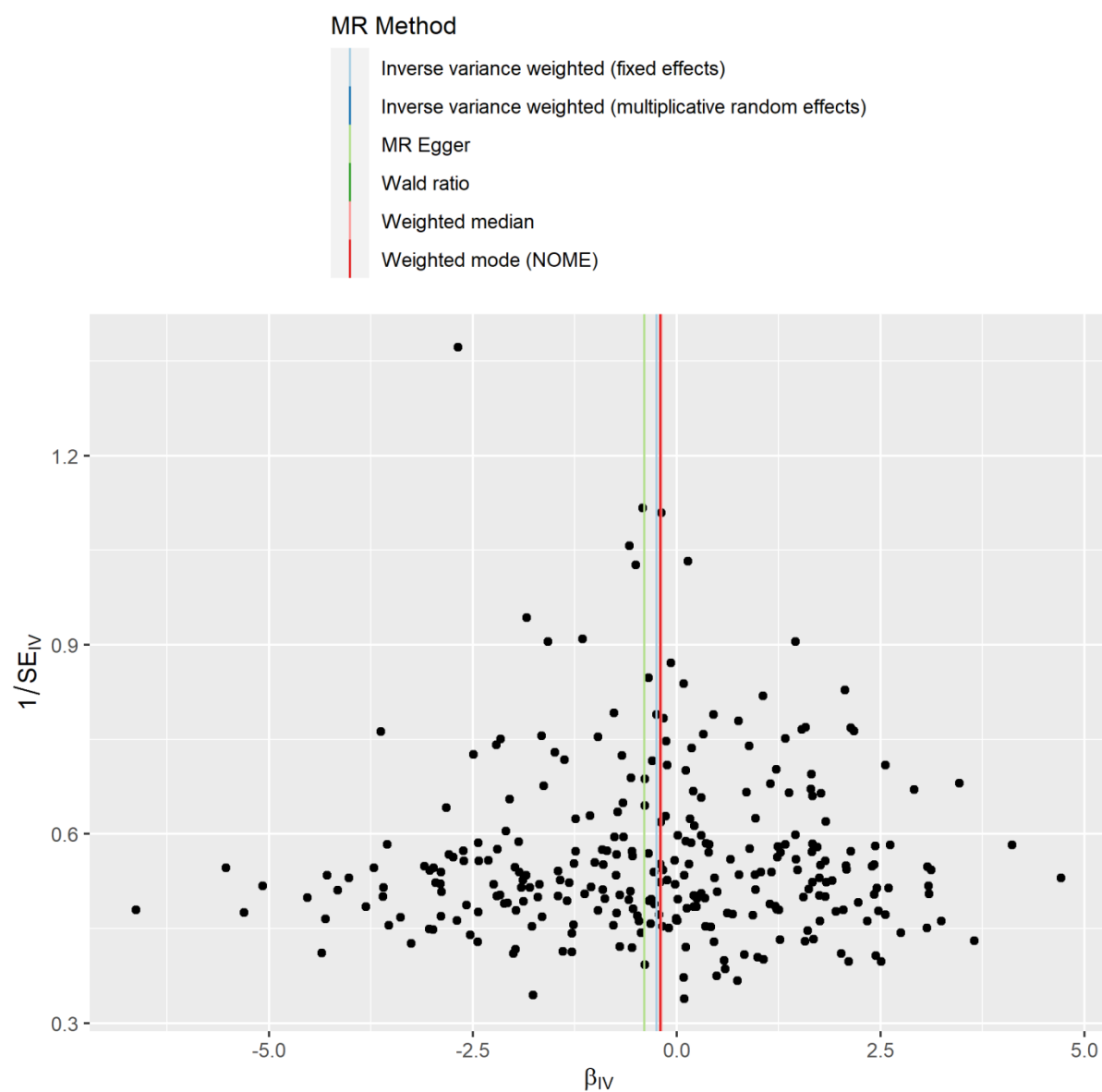
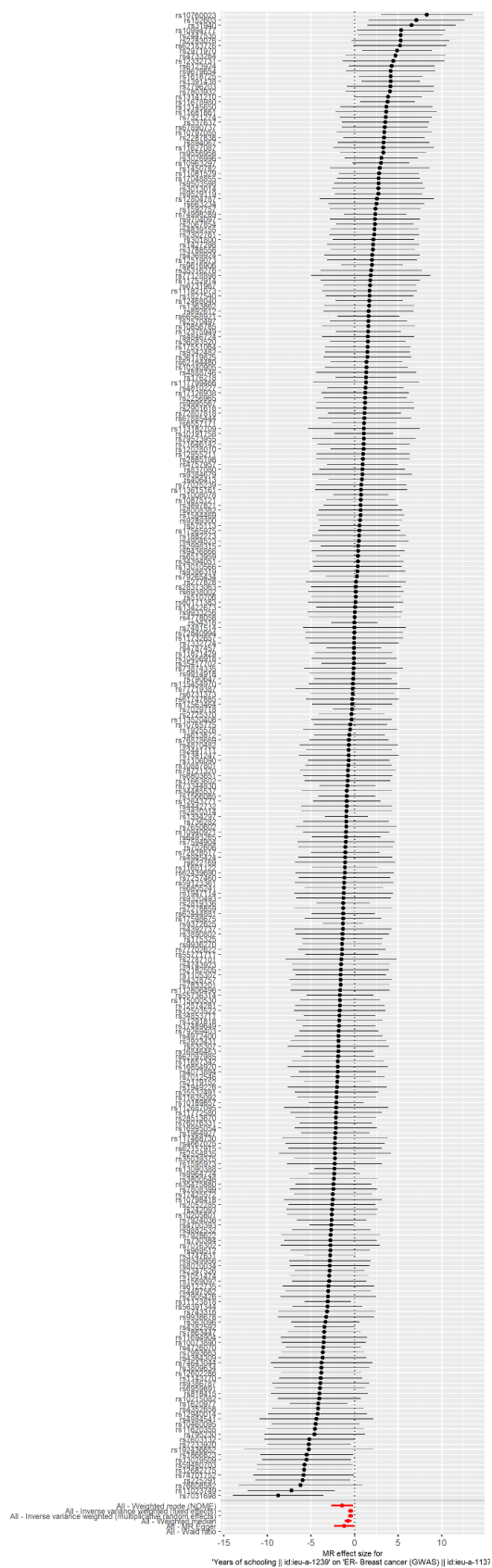


Fig.S18 Funnel plot of SNPs associated with education and their risk of ER- (iCOGS)



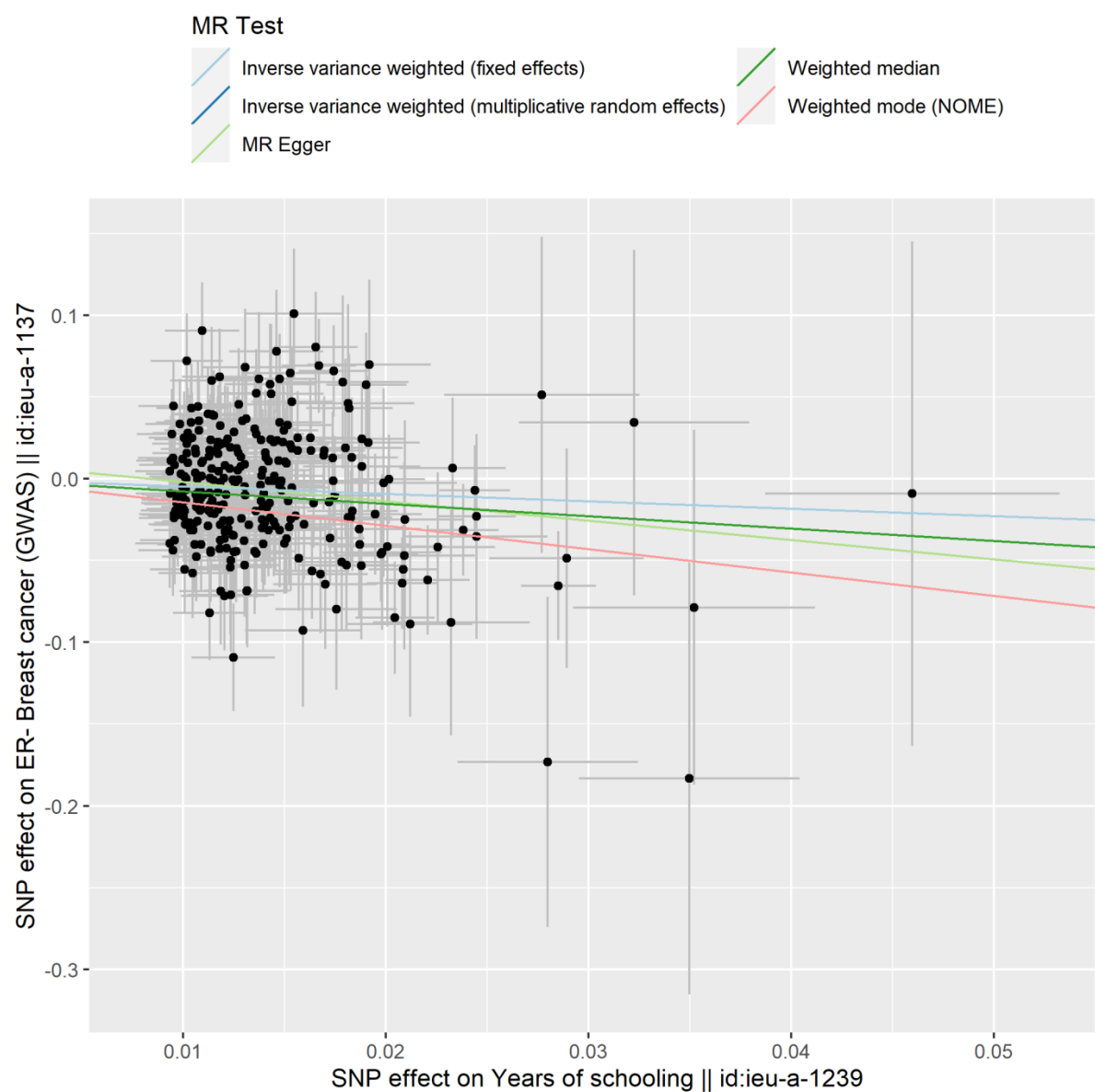
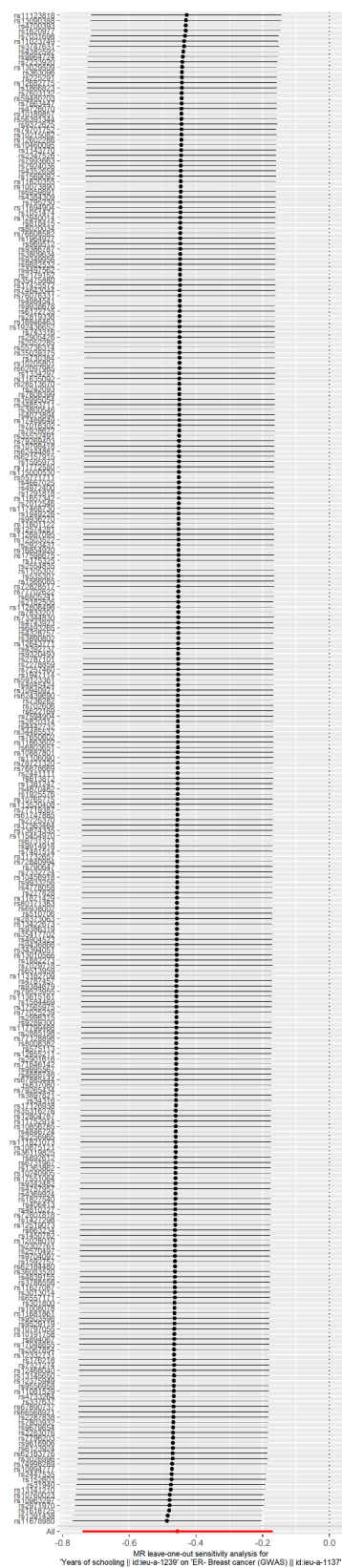


Fig.S20 Scatter plot of SNPs associated with education and their risk of ER- (GWAS)



**Fig.S21 Leave-one-out plot of SNPs associated with education and their risk of ER-
(GWAS)**

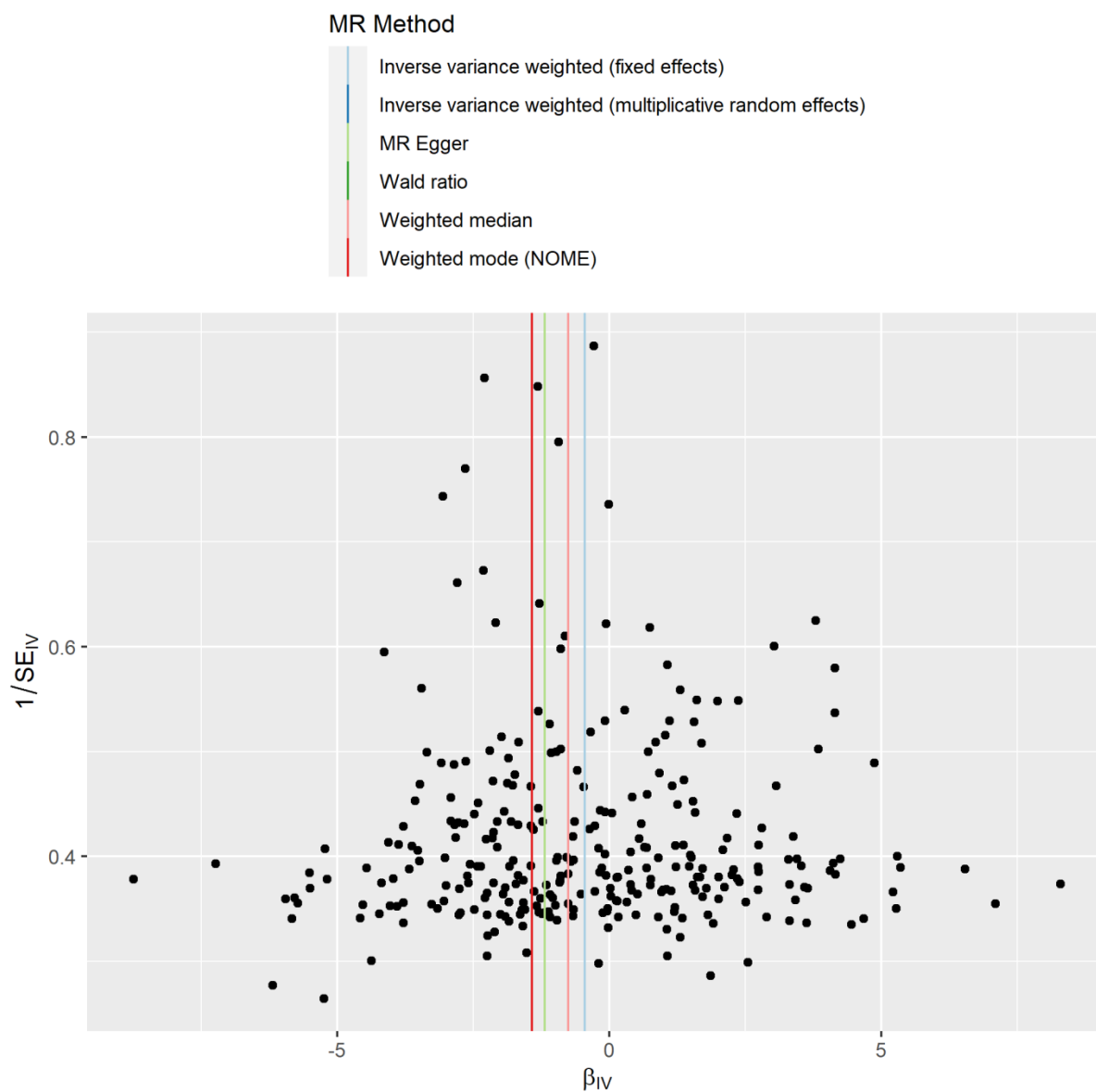


Fig.S22 Funnel plot of SNPs associated with education and their risk of ER- (GWAS)

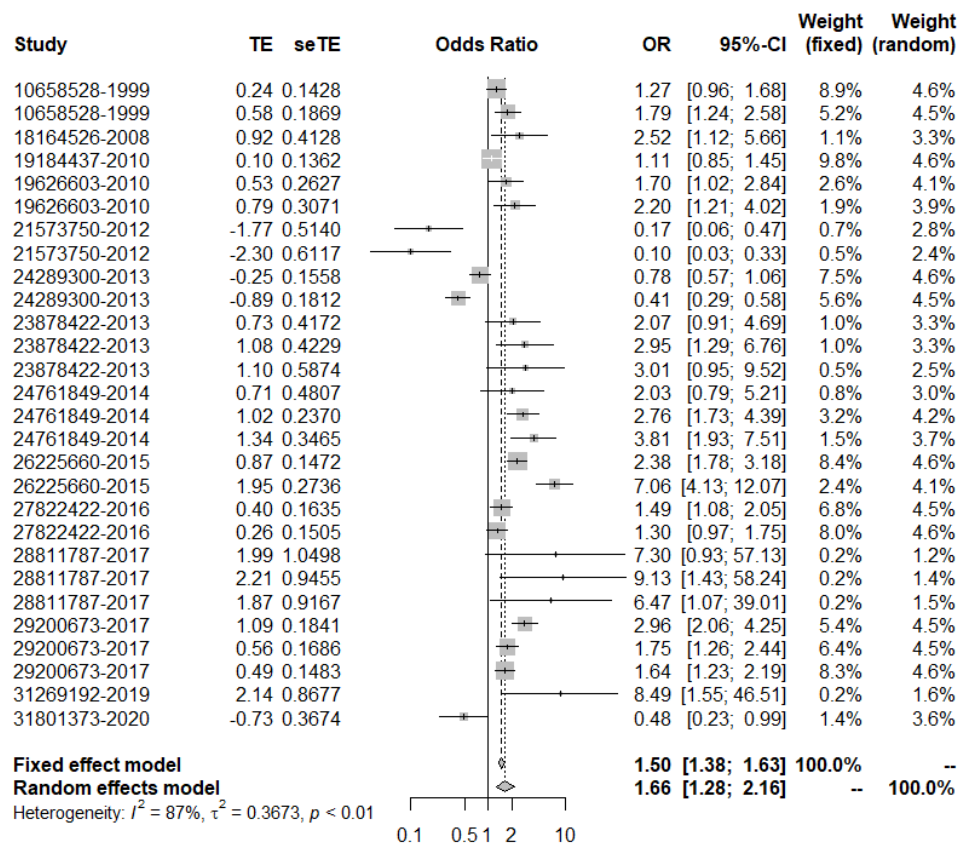


Fig.S23 Forest plot of meta-analysis (OR)

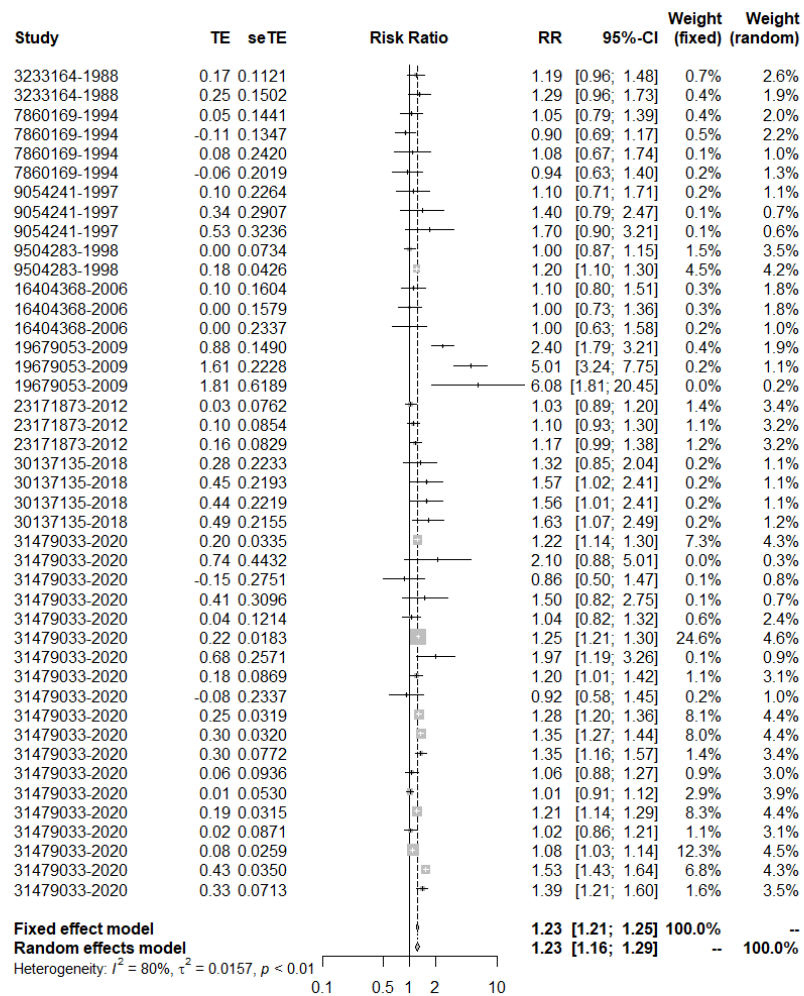


Fig.S24 Forest plot of meta-analysis (RR)

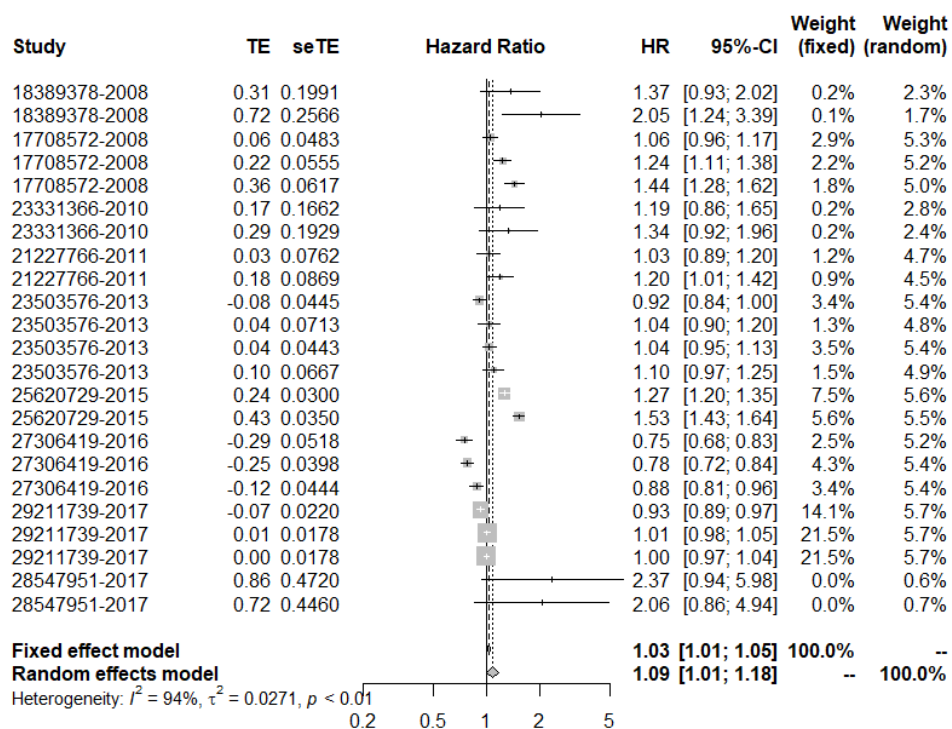


Fig.S25 Forest plot of meta-analysis (HR)