

Figure S1: Scatter plot of the MR estimates for the association of homocysteine with risk of OA and subtypes. (a) overall OA; (b) knee OA; (c) hip OA; (d) spine OA; (e) hand OA; (f) thumb OA. The x-axis represents the effect size of SNPs on homocysteine; the y-axis represents the effect size of SNPs on OA and subtypes. Colors of fitted line represents for four approaches used in univariable MR analyses.

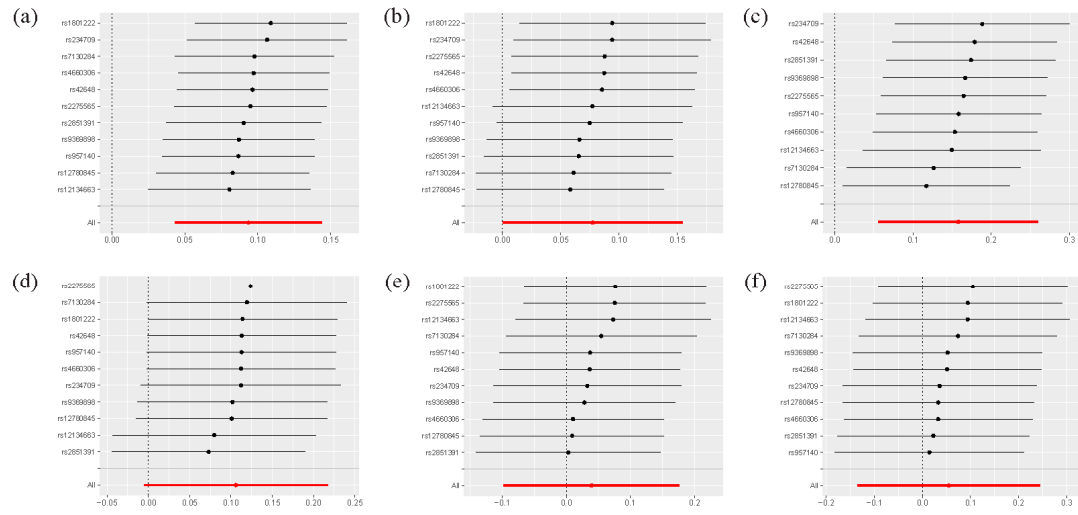


Figure S2: Leave-one-out analysis for MR analysis of the causal effect of homocysteine on OA and subtypes. (a) overall OA; (b) knee OA; (c) hip OA; (d) spine OA; (e) hand OA; (f) thumb OA.

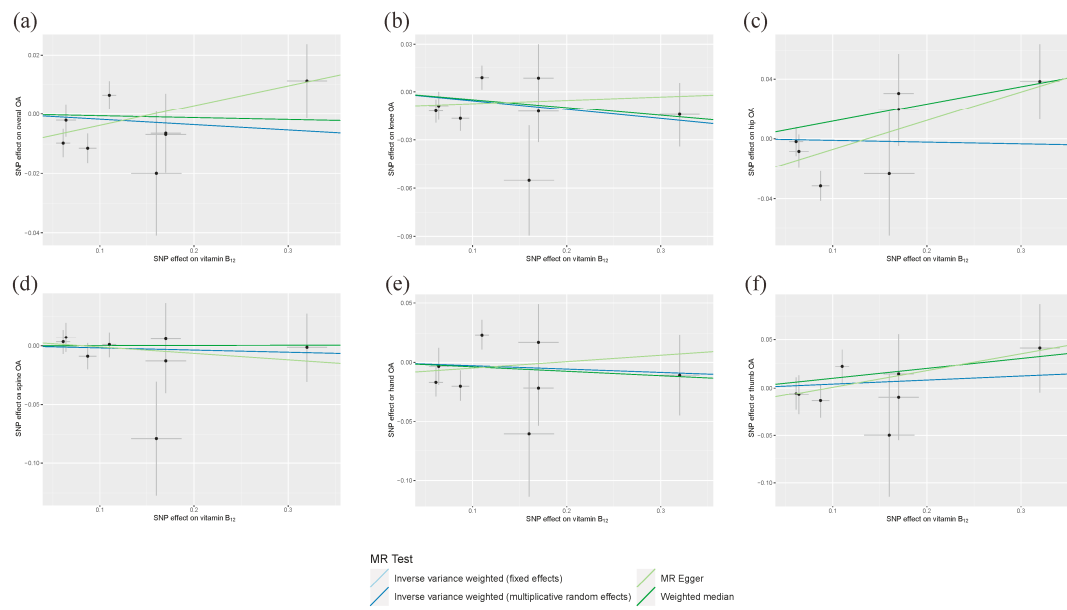


Figure S3: Scatter plot of the MR estimates for the association of vitamin B₁₂ with risk of OA and subtypes. (a) overall OA; (b) knee OA; (c) hip OA; (d) spine OA; (e) hand OA; (f) thumb OA. The x-axis represents the effect size of SNPs on vitamin B₁₂; the y-axis represents the effect size of SNPs on OA and subtypes. Colors of fitted line represents for four approaches used in univariable MR analyses.

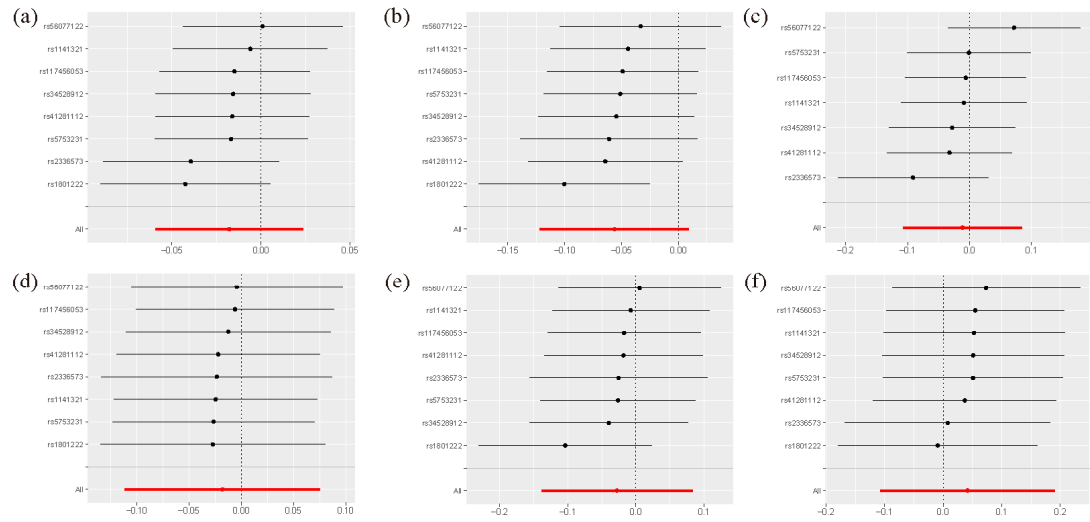


Figure S4: Leave-one-out analysis for MR analysis of the causal effect of Vitamin B₁₂ on OA and subtypes. (a) overall OA; (b) knee OA; (c) hip OA; (d) spine OA; (e) hand OA; (f) thumb OA.

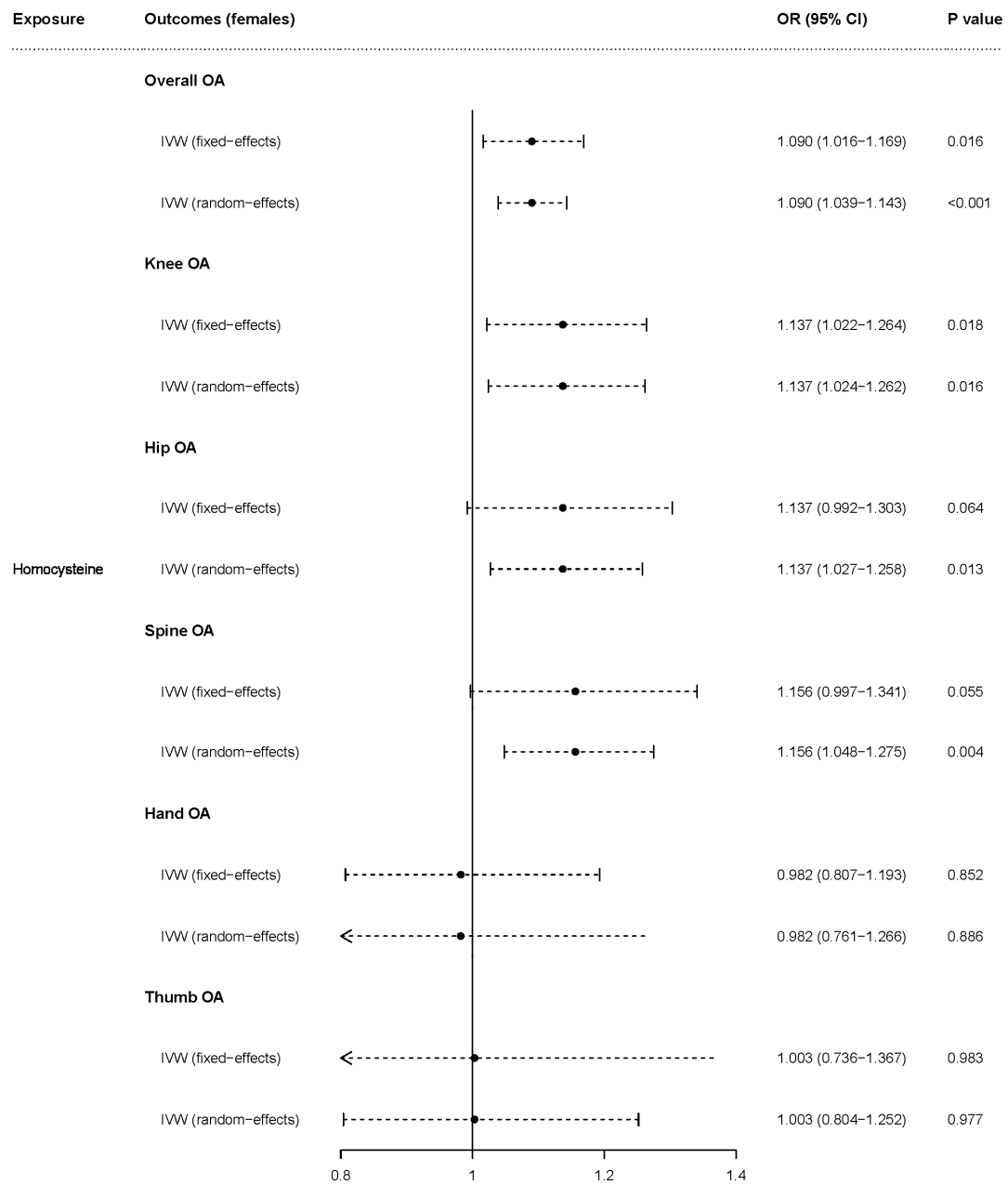


Figure S5: Causal effect of homocysteine on OA in females in fixed-effects and random-effects IVW analysis. OR: odds ratio; CI: confidence interval; P value: P value of the causal estimate.

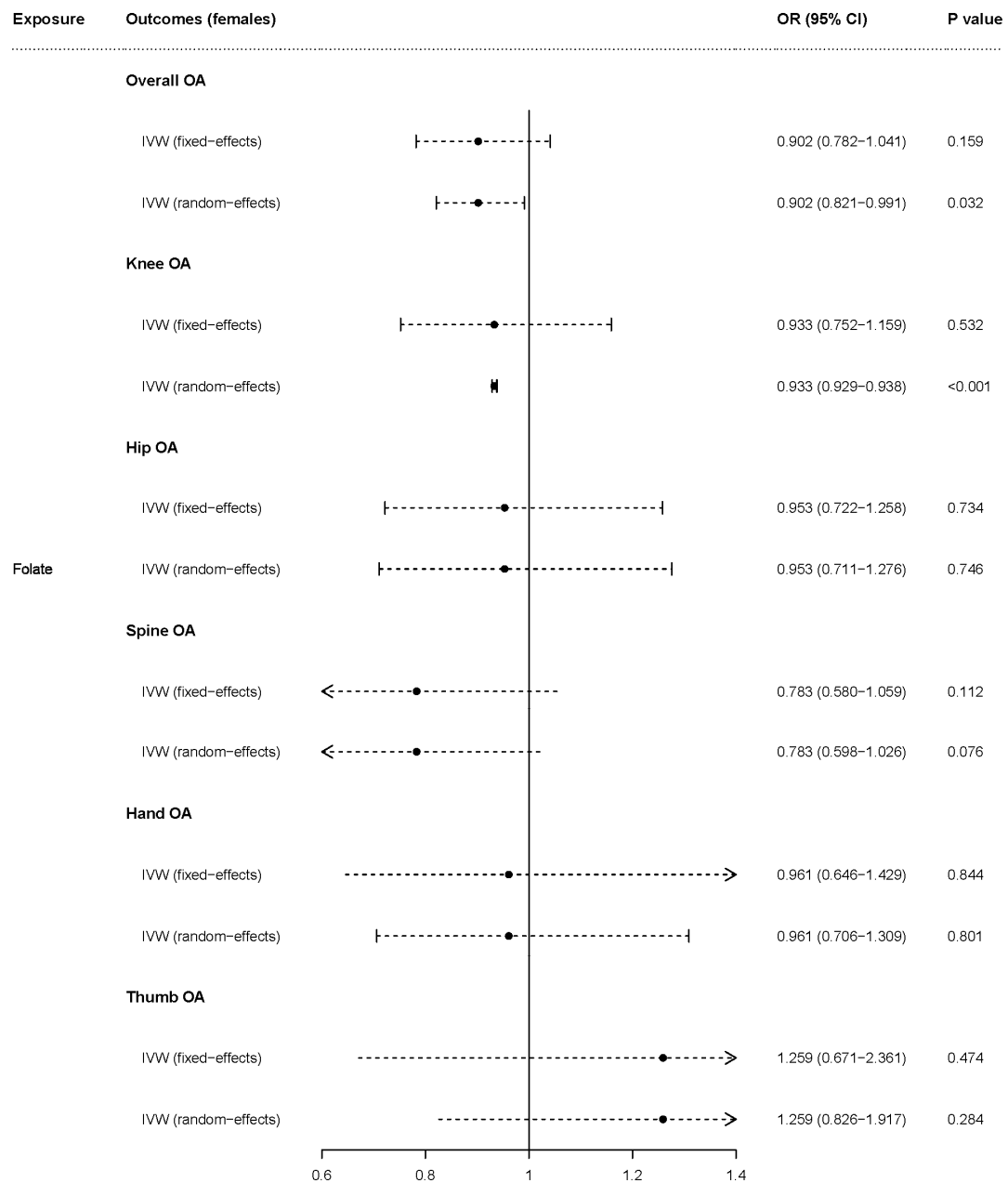


Figure S6: Causal effect of folate on OA in females in fixed-effects and random-effects IVW analysis. OR: odds ratio; CI: confidence interval; P value: P value of the causal estimate.

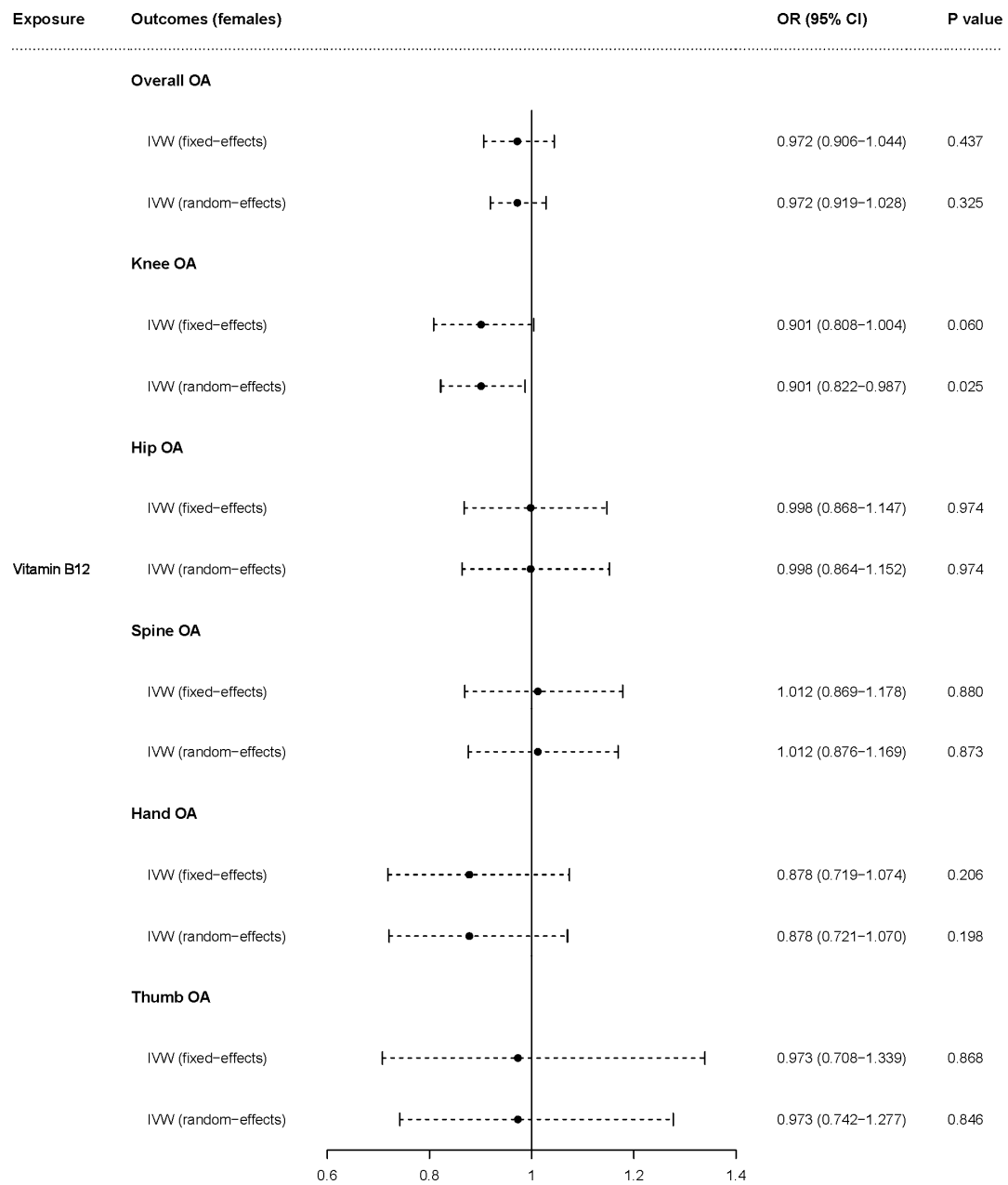


Figure S7: Causal effect of vitamin B₁₂ on OA in females in fixed-effects and random-effects IVW analysis. OR: odds ratio; CI: confidence interval; P value: P value of the causal estimate.

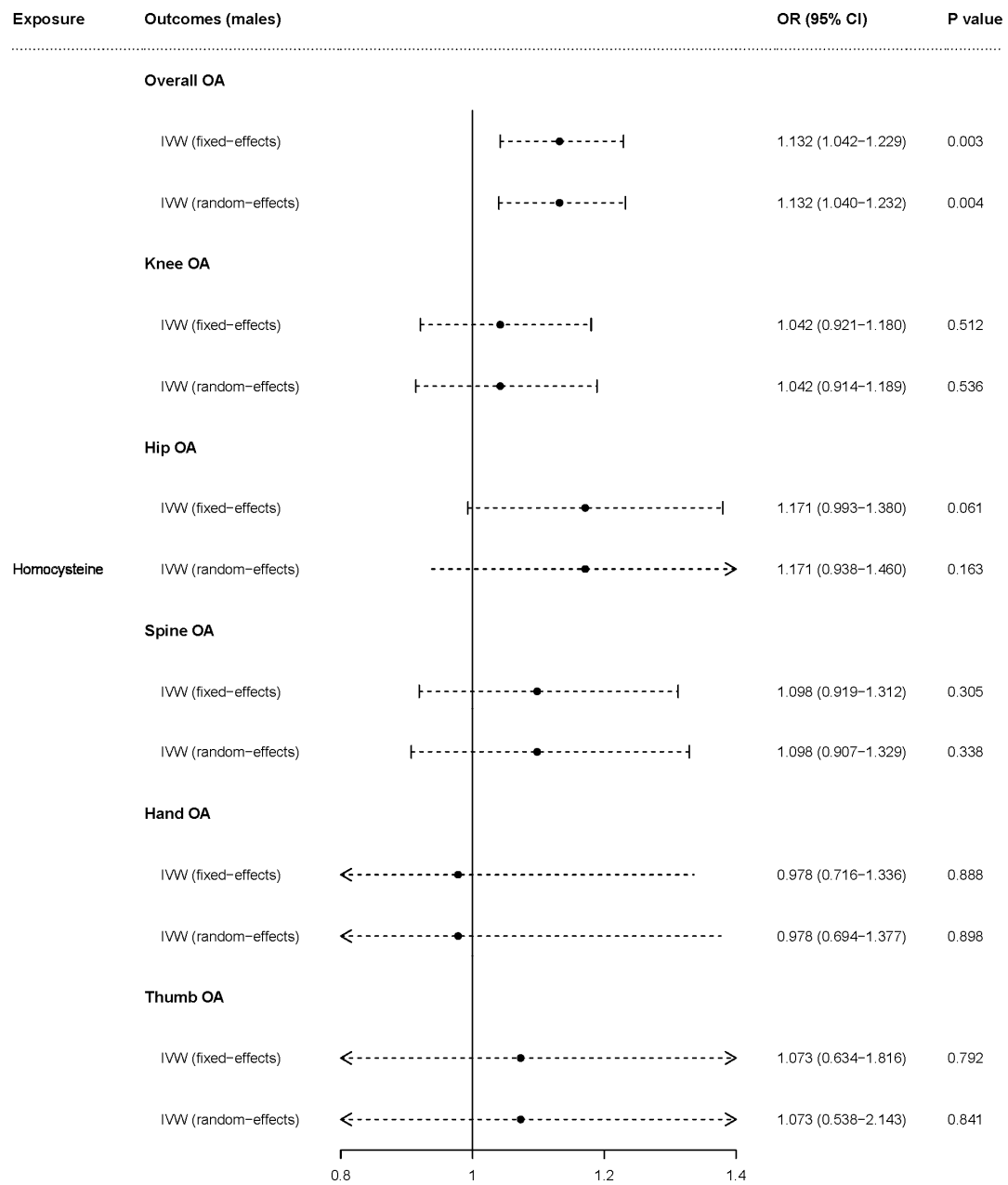


Figure S8: Causal effect of homocysteine on OA in males in fixed-effects and random-effects IVW analysis. OR: odds ratio; CI: confidence interval; P value: P value of the causal estimate.

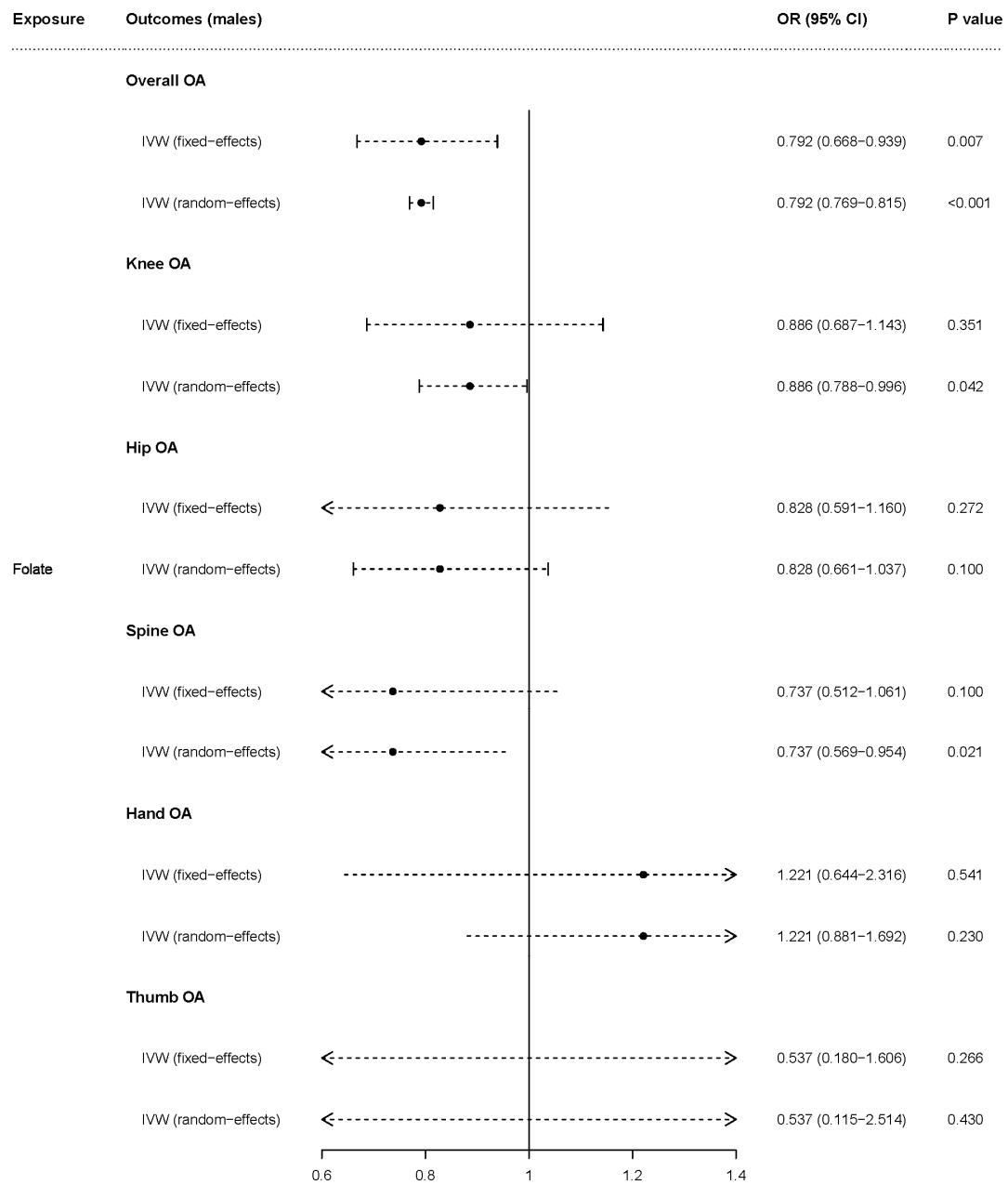


Figure S9: Causal effect of folate on OA in males in fixed-effects and random-effects IVW analysis. OR: odds ratio; CI: confidence interval; P value: P value of the causal estimate.

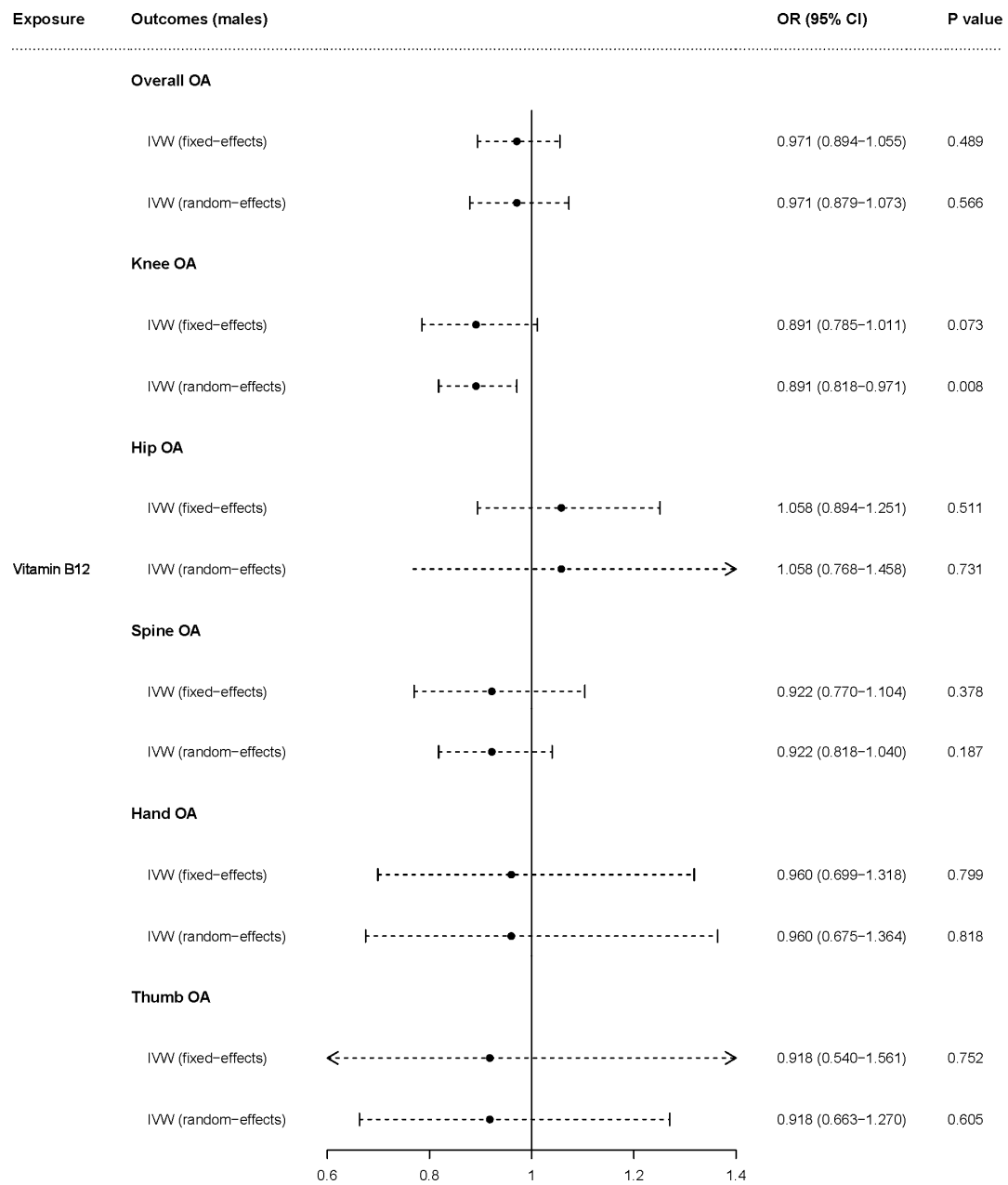


Figure S10: Causal effect of vitamin B12 on OA in males in fixed-effects and random-effects IVW analysis. OR: odds ratio; CI: confidence interval; P value: P value of the causal estimate.