

Supplementary Table 1 The results of heterogeneity test and pleiotropy test between Gastroesophageal reflux disease/Barret's esophagus and hypertension

| Exposure | Outcome | Heterogeneity | | | | Pleiotropy | |
|---------------------------------|----------------------------------|---------------------------|-----------------|-----------|-----------------|---------------------|---------------------|
| | | Inverse variance weighted | | MR Egger | | MR Egger regression | MR PRESSO |
| | | Cochran Q | P | Cochran Q | P | P | Global test P-value |
| | | | | | | | |
| Gastroesophageal reflux disease | Essential hypertension | 103.6443 | 0.0034878 58 | 100.9469 | 0.004636 986 | 0.1854145 | 0.009 |
| | Duplicate essential hypertension | 65.37856 | 0.8024792 | 65.37846 | 0.778423 5 | 0.9921646 | 0.805 |
| | Diastolic blood pressure | 90.05958 | 0.0034343 99 | 88.87735 | 0.003382 639 | 0.3917776 | 0.008 |
| | Systolic blood pressure | 60.65549 | 0.4520543 | 57.59683 | 0.527372 8 | 0.08550865 | 0.483 |
| | Hypertensive heart disease | 91.22989 | 0.0848629 | 90.19988 | 0.083931 | 0.3642368 | 0.105 |

| | | | | | | | |
|--------------------|---|----------|-----------|----------|-----------|-----------|-------|
| | | | 7 | | 38 | | |
| | Hypertensive heart and/or renal disease | 76.00396 | 0.3508558 | 74.81702 | 0.3555095 | 0.2921456 | 0.365 |
| Barret's esophagus | Essential hypertension | 13.71352 | 0.547358 | 12.97158 | 0.5287624 | 0.4035531 | 0.558 |
| | Duplicate essential hypertension | 14.09724 | 0.5181672 | 14.04153 | 0.4466219 | 0.8170847 | 0.548 |

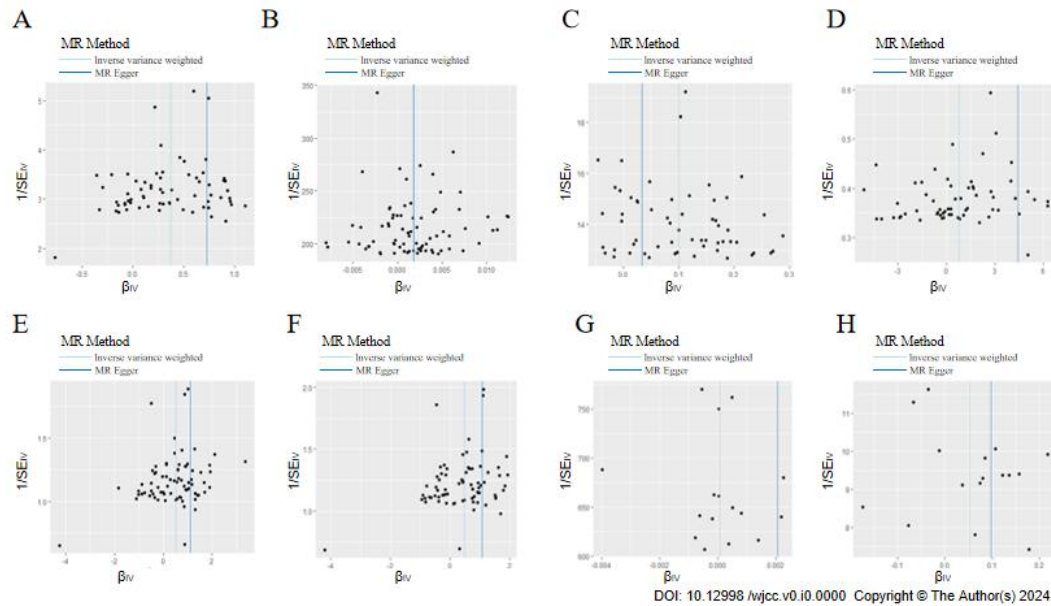
MR-Egger: mendelian randomization egger; MR-PRESSO: Mendelian randomization-Pleiotropy RESidual Sum and Outlier.

Supplementary Table 2 The results of heterogeneity test and pleiotropy test between Essential hypertension and Gastroesophageal reflux disease/Barret's esophagus

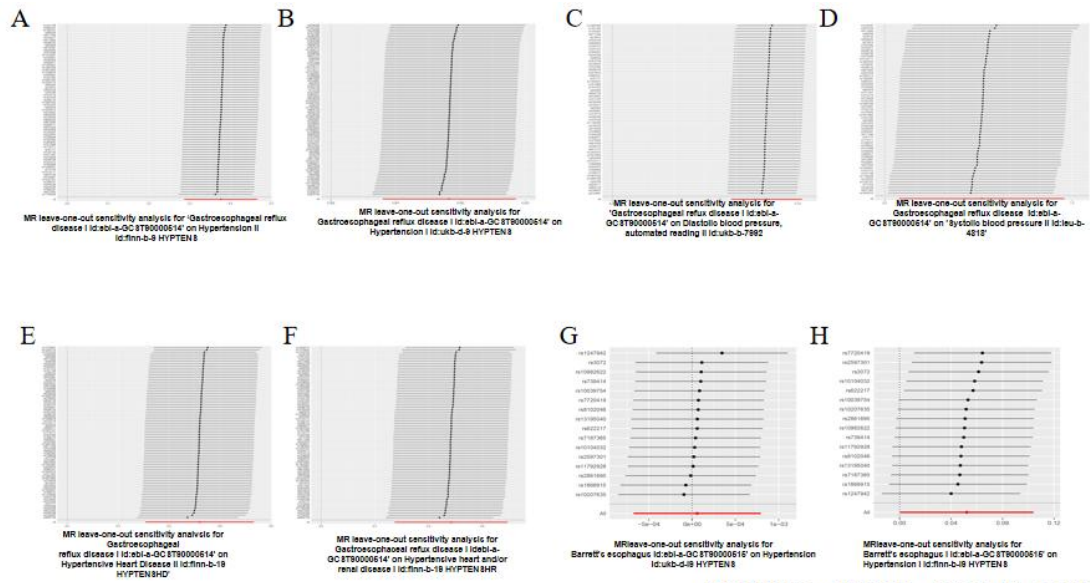
| Exposure | Outcome | Heterogeneity | | | | Pleiotropy | |
|----------------------------------|---------------------------------|---------------------------|--------------|-----------|----------------|---------------------|---------------------|
| | | Inverse variance weighted | | MR Egger | | MR Egger regression | MR PRESSO |
| | | Cochran Q | P | Cochran Q | P | P | Global test P-value |
| Duplicate essential hypertension | Gastroesophageal reflux disease | 40.88174 | 0.08889 | 40.57698 | 0.074936 | 0.644 | 0.088 |
| Diastolic blood pressure | | 249.1981 | 1.434041e-06 | 239.5778 | 0.000007512724 | 0.01459549 | <0.001 |
| Systolic blood pressure | Barret's esophagus | 9.017234 | 0.5304688 | 6.90974 | 0.6465163 | 0.1805292 | 0.616 |
| Duplicate essential hypertension | | 34.80887 | 0.2496612 | 34.67023 | 0.215573 | 0.7358991 | 0.243 |

*Except that the results of diastolic blood pressure and diastolic blood pressure were expressed in beta, other results were

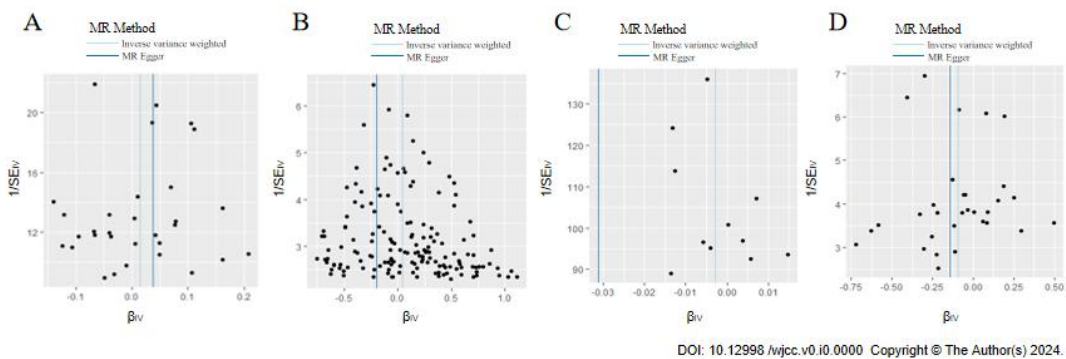
expressed in OR. Step:1, MR analysis without removing SNPs; 2, MR analysis after removing the SNPs (with P value less than threshold in MR-PRESSO test); 3, MR analysis after removing all the SNPs (with P value less than 1 in MR-PRESSO outlier test). N snp: number of single nucleotide polymorphisms; IVW: inverse variance weighted; WM: weighted median; MR-Egger: mendelian randomization egger.



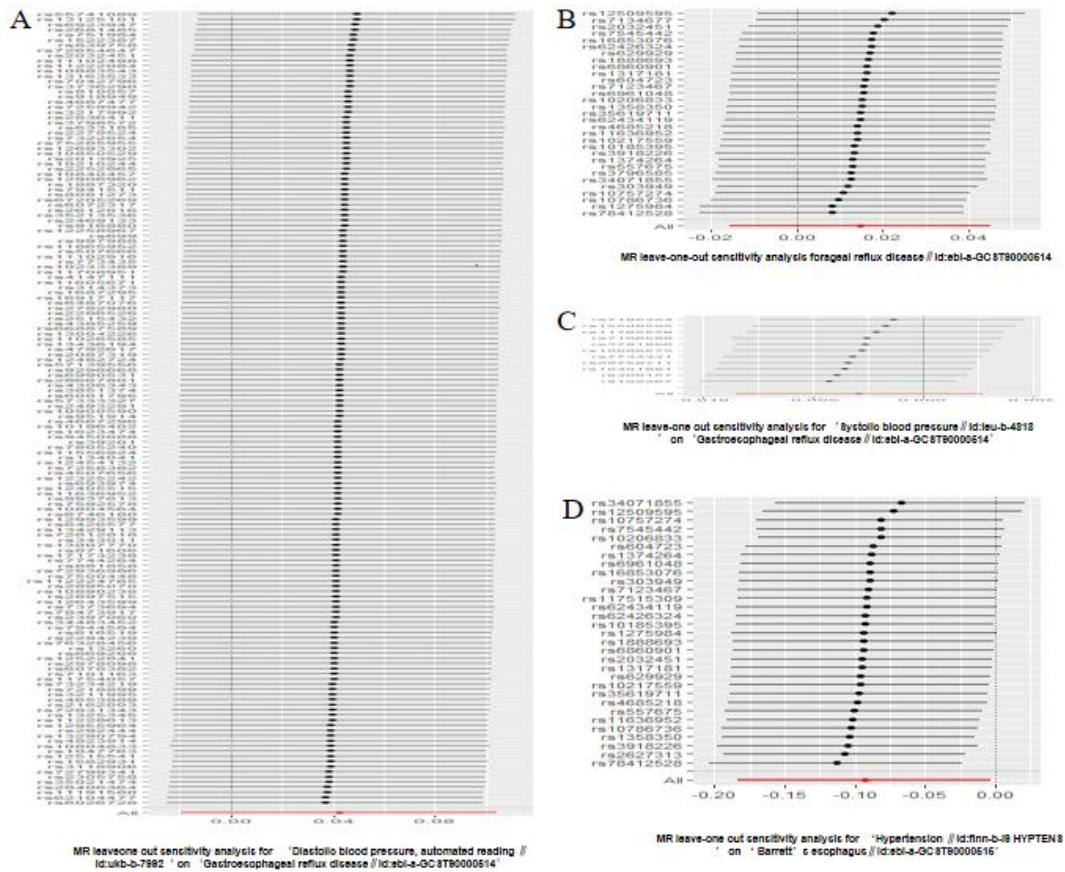
Supplementary Figure 1 Funnel plot of Mendelian randomization estimates between gastroesophageal reflux disease/Barret's esophagus and essential hypertension. A: Gastroesophageal reflux disease (GERD) on essential hypertension; B: replication practice for GERD on essential hypertension; C: GERD on diastolic blood pressure; D: GERD on systolic blood pressure; E: GERD on hypertensive heart disease; F: GERD on hypertensive heart and/or renal disease; G: Barret's esophagus (BE) on essential hypertension; H: replication practice for BE on essential hypertension. MR-Egger: Mendelian randomization egger; MR-PRESSO: Mendelian randomization-Pleiotropy RESidual Sum and Outlier.



Supplementary Figure 2 Results of “leave-one-out” sensitivity analysis.
 A-F: Mendelian randomization estimates between Gastroesophageal reflux disease/Barrett's esophagus; G and H: Essential hypertension.



Supplementary Figure 3 Funnel plot of Mendelian randomization estimates between essential hypertension and gastroesophageal reflux disease/Barrett's esophagus. A: Duplicate essential hypertension on GERD; B: Diastolic blood pressure and GERD; C: Systolic blood pressure and GERD; D: Duplicate essential hypertension on Barrett's esophagus.



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Supplementary Figure 4 Results of “leave-one-out” sensitivity analysis. A-C: MR estimates between essential hypertension and Gastroesophageal reflux disease; **D:** Barret's esophagus.