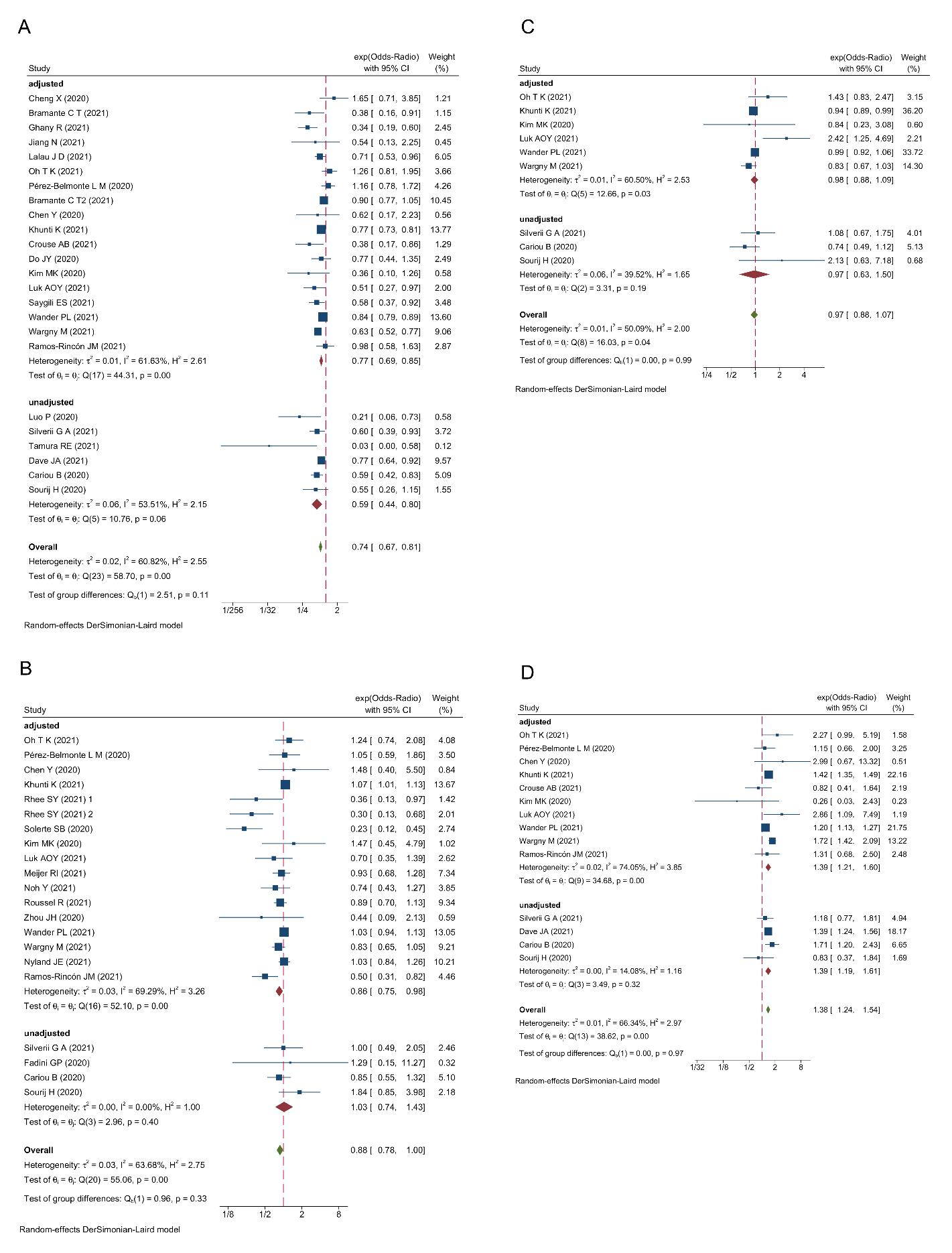
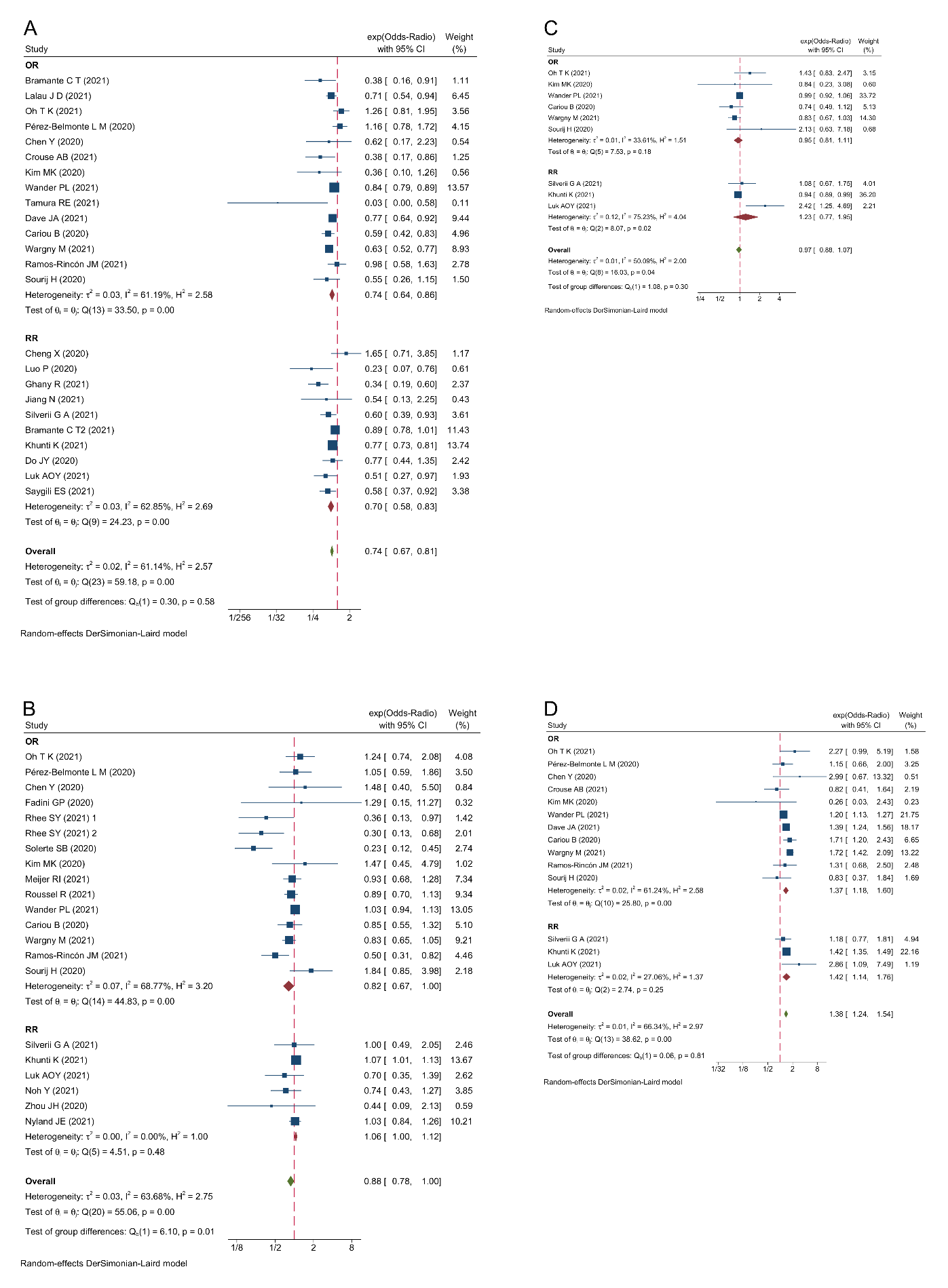
**S Figures 1.** Subgroup analysis of different data types on mortality. (A) Metformin; (B) DPP4i; (C) Sulfonylurea; (D) Insulin.

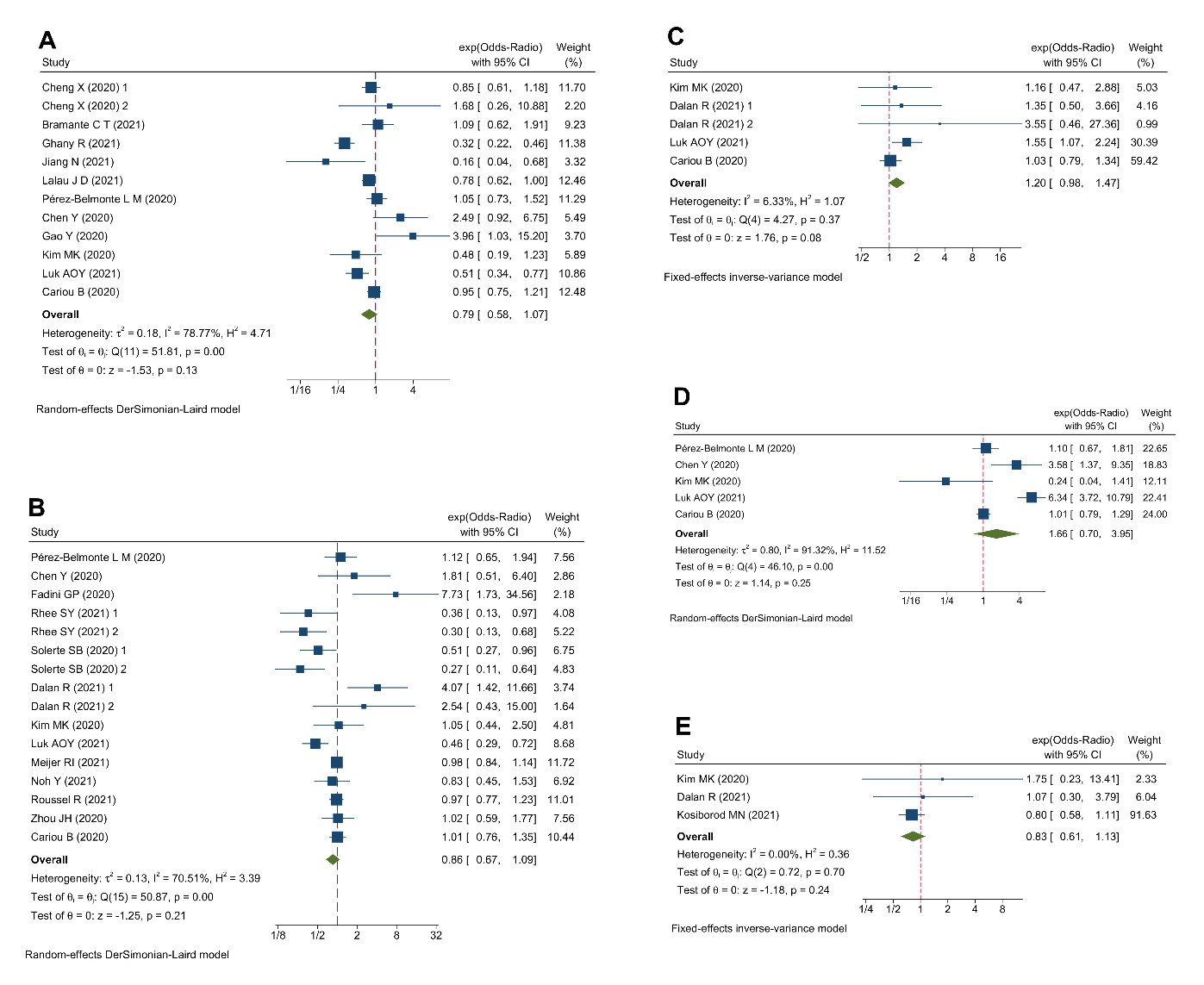
**S Figures 2.** Subgroup analysis of different effect size on mortality. (A) Metformin; (B) DPP4i; (C) Sulfonylurea; (D) Insulin.



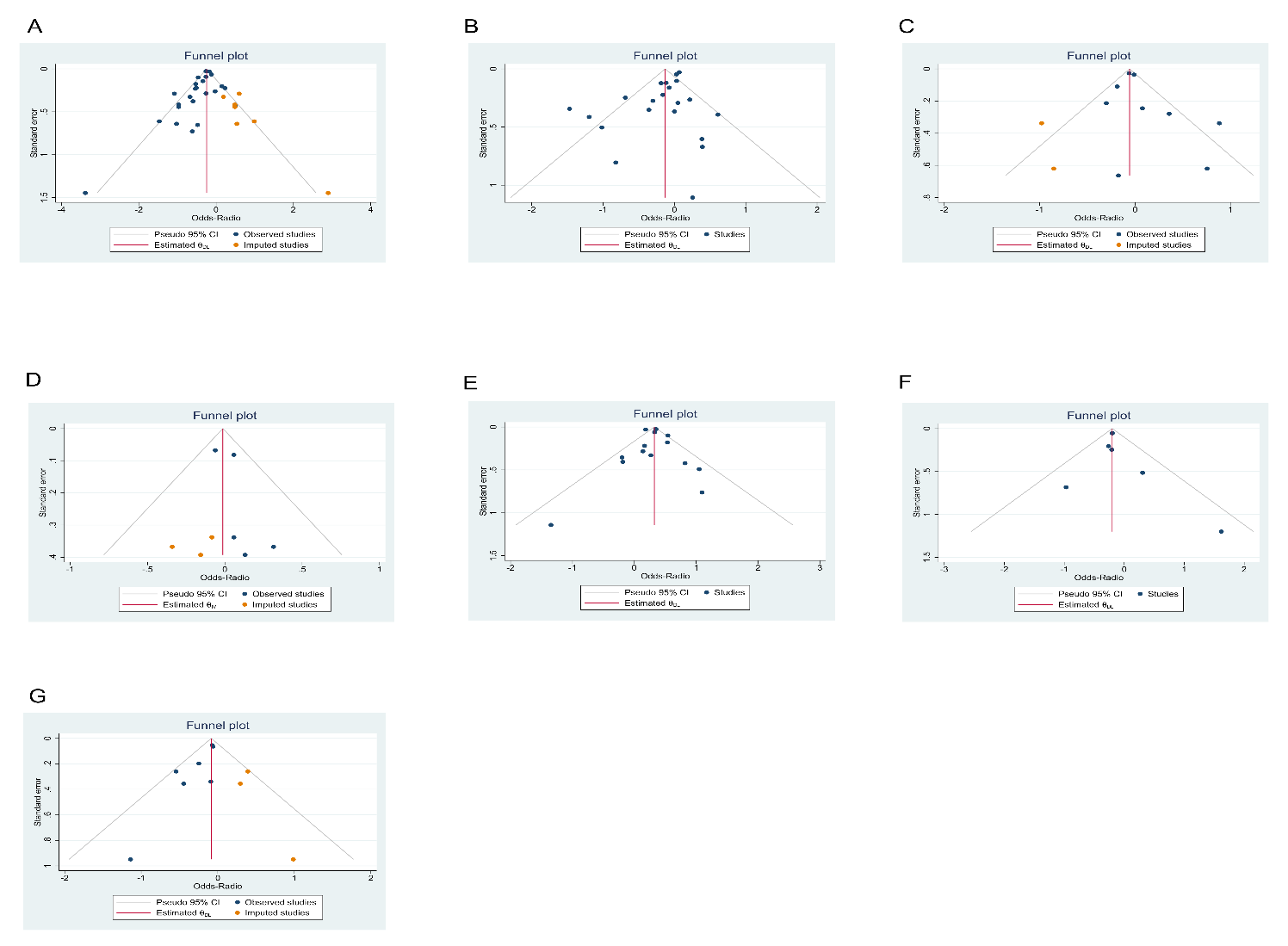
**S Figures 3.** Subgroup analysis of different diabetes types on mortality. (A) Metformin; (B) DPP4i; (C) Sulfonylurea; (D) Insulin.

S Figures 4. Subgroup analysis of medication use timing on mortality. (A) Metformin; (B) DPP4i; (C) Sulfonylurea; (D) Insulin.

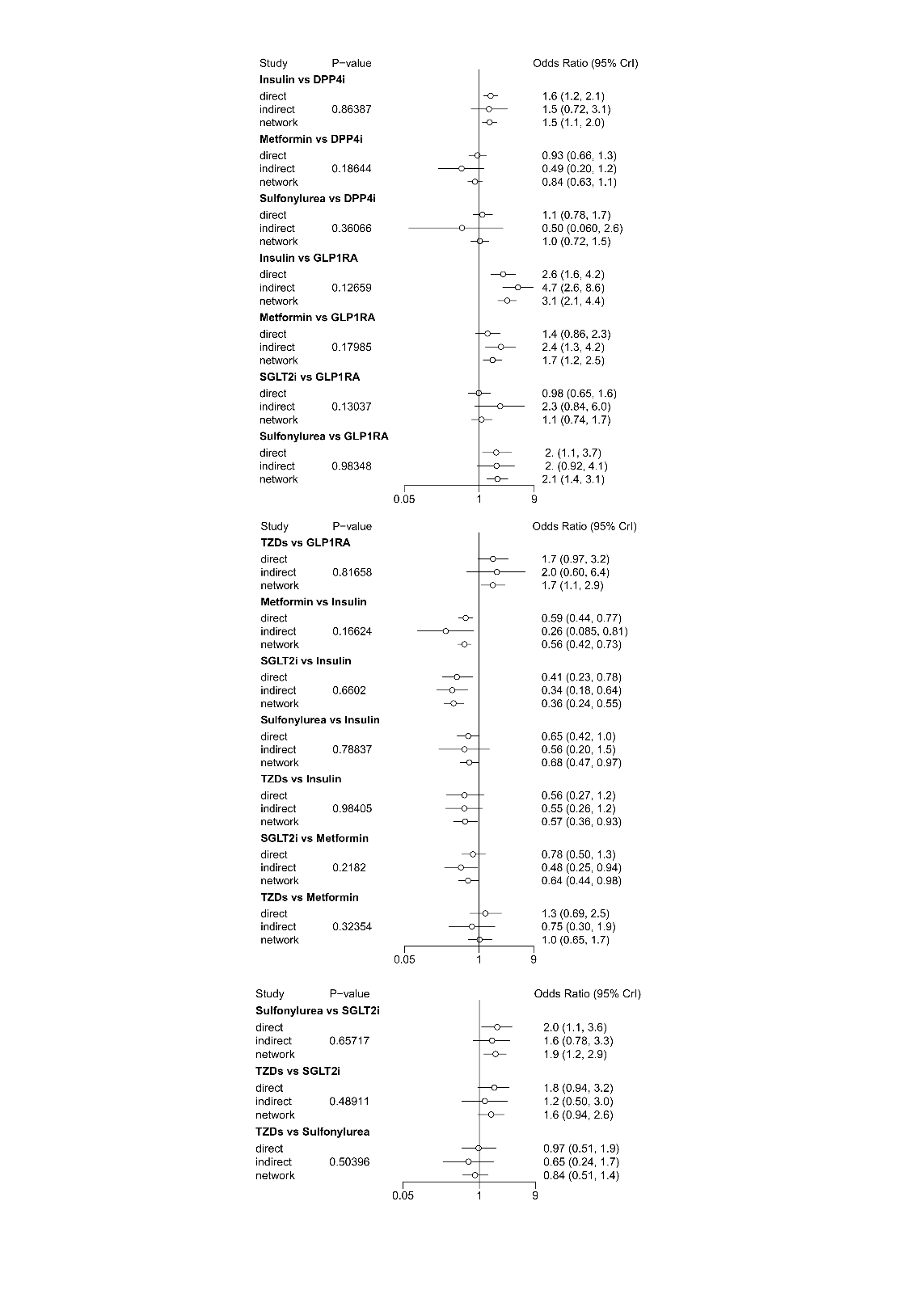
**S Figures 5.** Forest plot showed the association of antidiabetic agents use with the outcome of severe disease. (A) Metformin; (B) DPP4i; (C) Sulfonylurea; (D) Insulin; (E) SGLT2i.



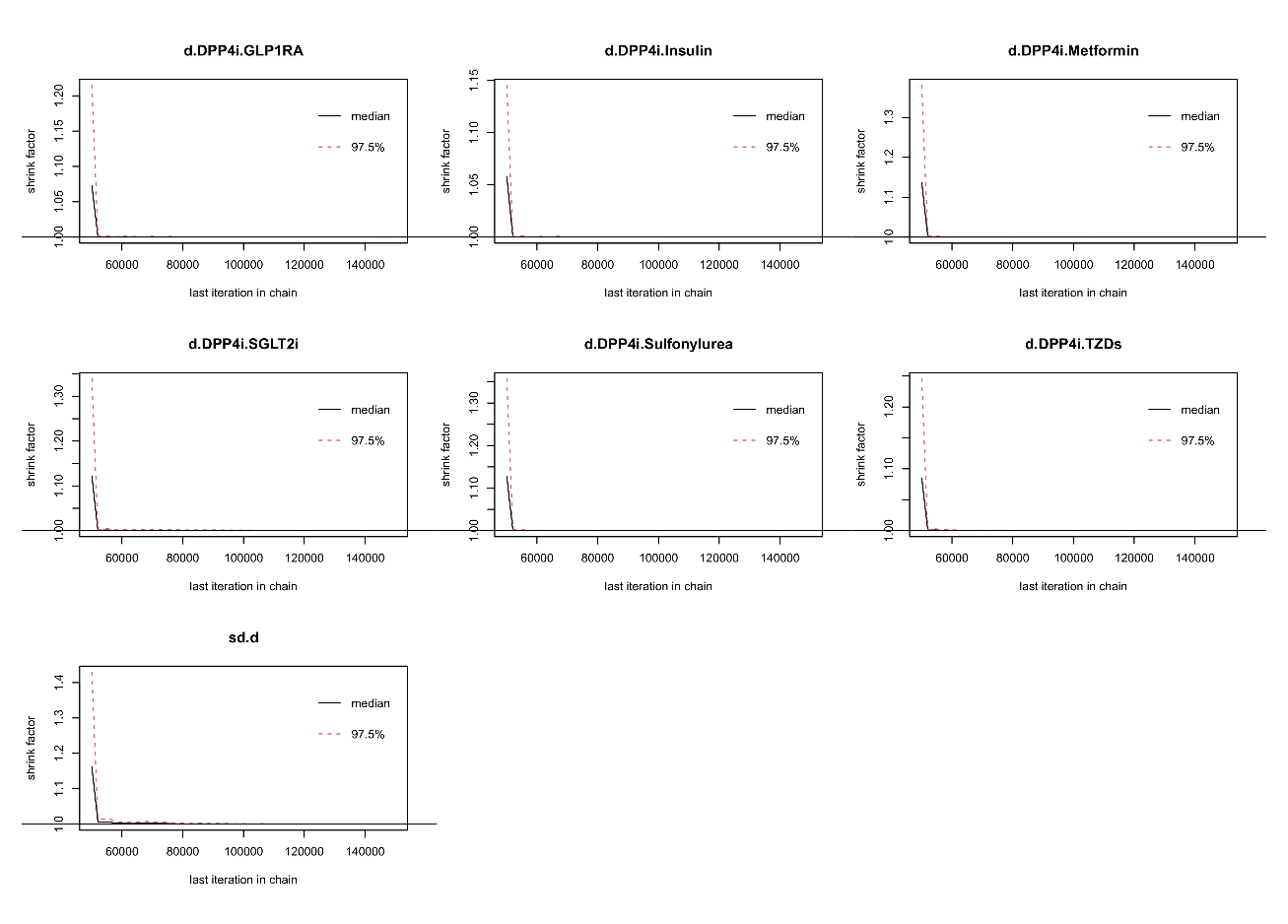
**S Figures 6.** The funnel plots for the mortality. (A) Metformin; (B) DPP4i; (C) Sulfonylurea; (D) TZDs; (E) Insulin; (F) SGLT2i; (G)GLP1RA.



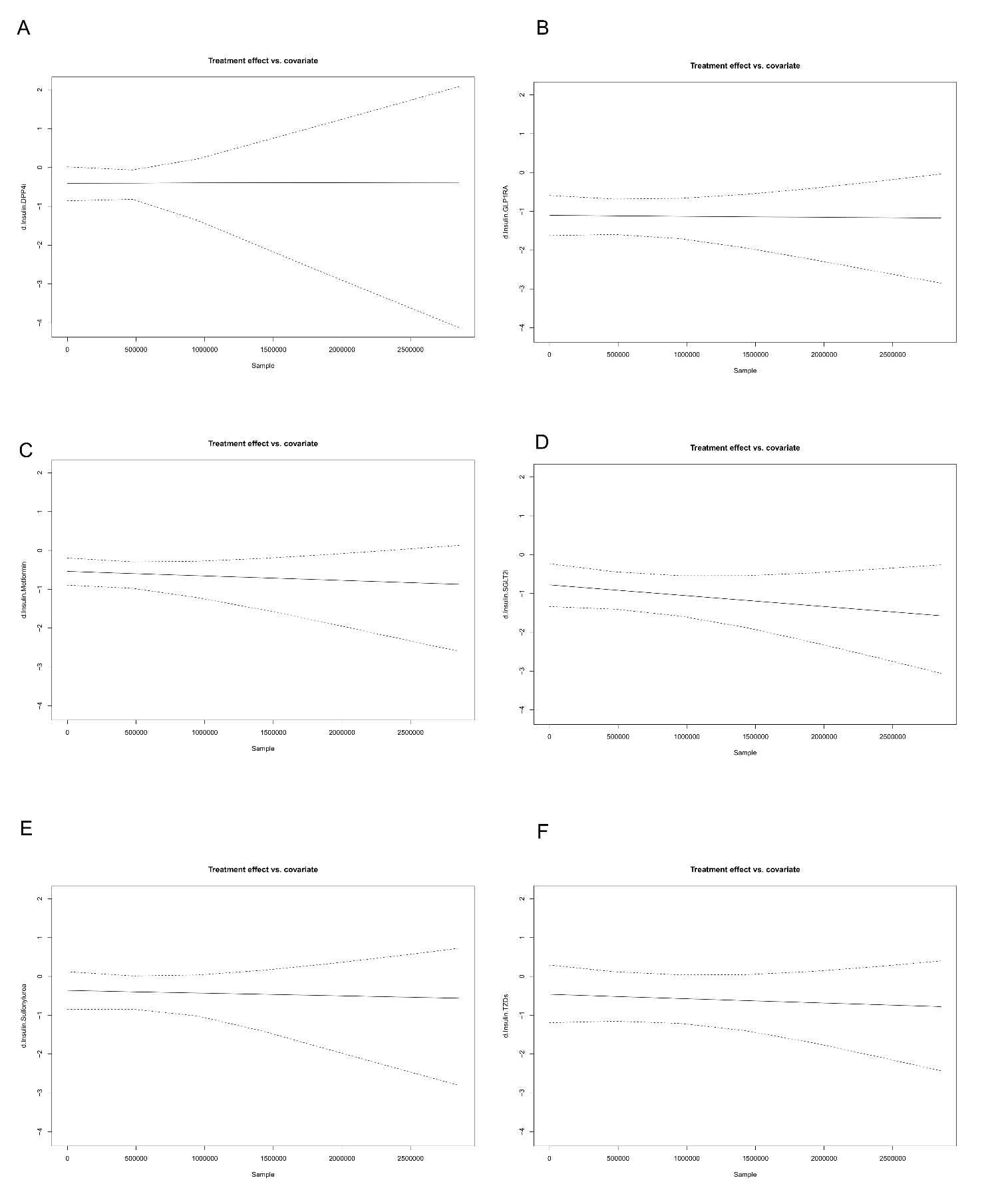
**S Figures 7.** Consistency analysis of direct and indirect comparison using node-splitting method.



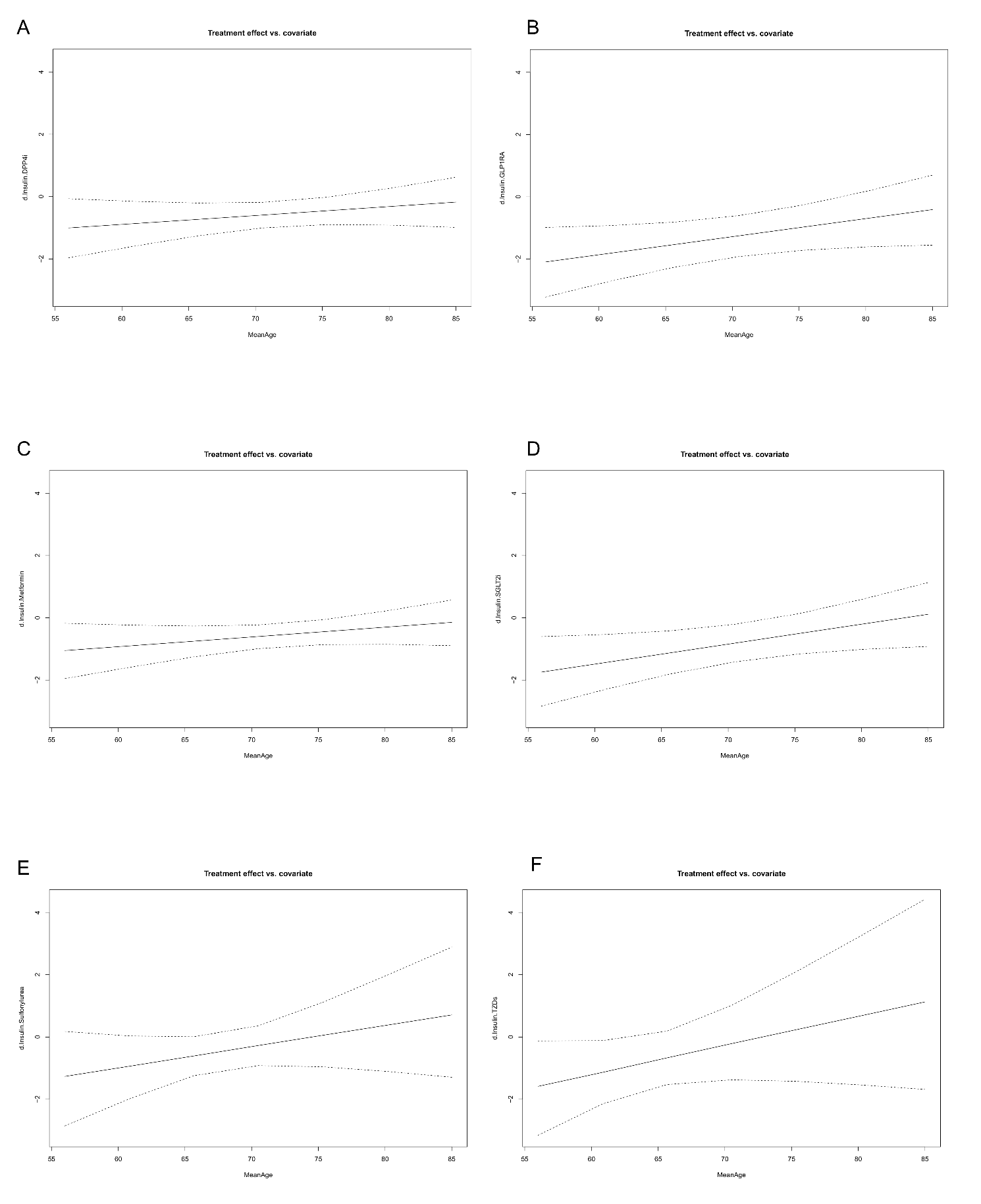
**S Figures 8.** The Brooks-Gelman-Rubin plots for the outcome of mortality in the Bayesian network meta-analysis.



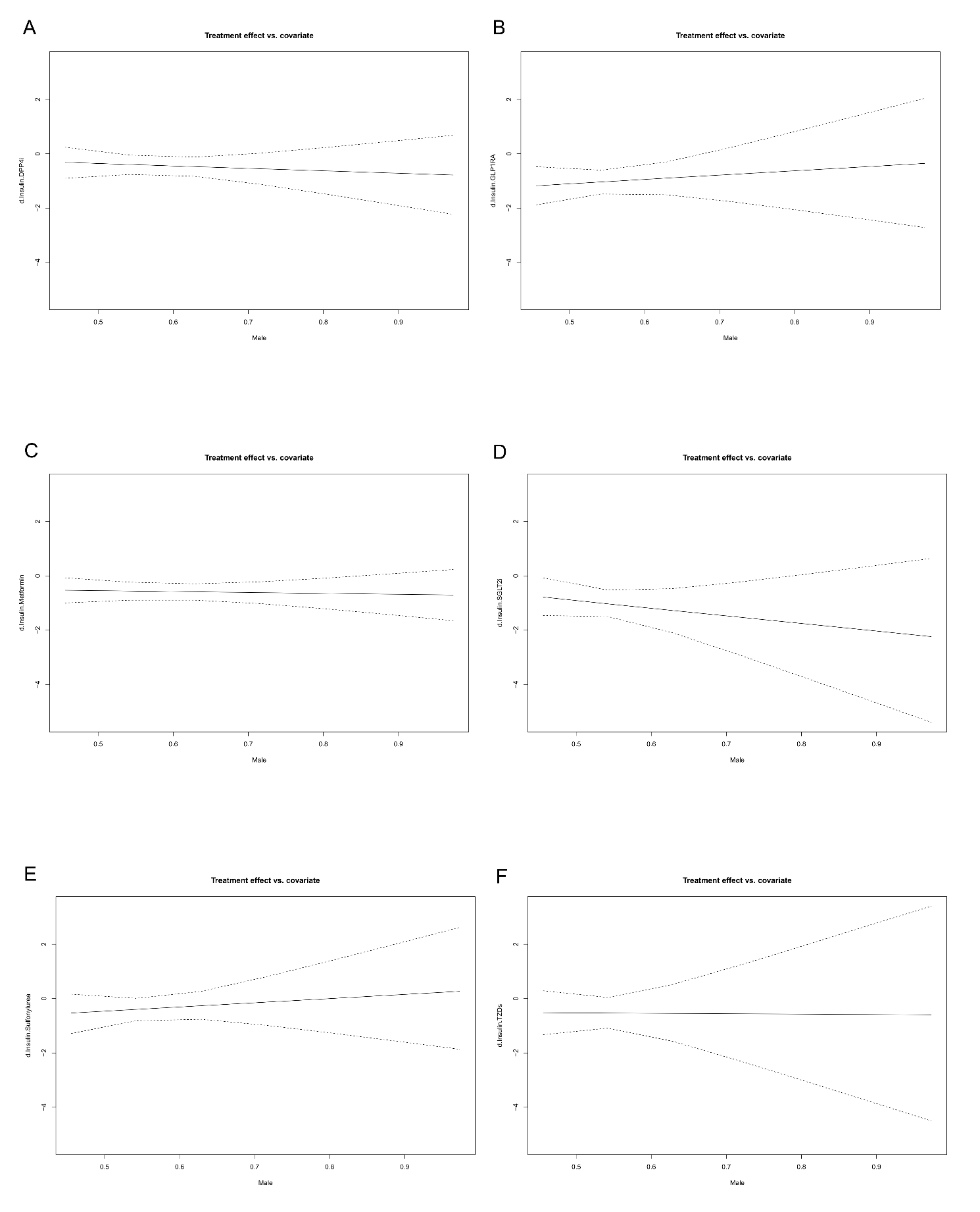
**S Figures 9.** Meta-regression analysis for the sample size between studies in the Bayesian network meta-analysis. (A) Insulin vs. DPP4i; (A) Insulin vs. GLP1RA; (A) Insulin vs. Metformin; (A) Insulin vs. SGLT2i; (A) Insulin vs. Sulfonylurea; (A) Insulin vs. TZDs.



**S Figures 10.** Meta-regression analysis for the mean age between studies in the Bayesian network meta-analysis. (A) Insulin vs. DPP4i; (A) Insulin vs. GLP1RA; (A) Insulin vs. Metformin; (A) Insulin vs. SGLT2i; (A) Insulin vs. Sulfonylurea; (A) Insulin vs. TZDs.



**S Figures 11.** Meta-regression analysis for the male proportion between studies in the Bayesian network meta-analysis. (A) Insulin vs. DPP4i; (A) Insulin vs. GLP1RA; (A) Insulin vs. Metformin; (A) Insulin vs. SGLT2i; (A) Insulin vs. Sulfonylurea; (A) Insulin vs. TZDs.



**S Table 1.** Search terms and strategies

|  |  |
| --- | --- |
| Metformin | Metformin OR Dimethylbiguanidine OR Dimethylguanylguanidine OR Glucophage |
| DPP4i | Dipeptidyl-Peptidase IV Inhibitors OR DPP-4 Inhibitors OR Sitagliptin OR Januvia OR Saxagliptin OR Onglyza OR Vildagliptin OR Galvus OR Alogliptin OR nesina OR Tiglitatin OR Linagliptin OR Tradjenta OR Trajenta |
| Sulfonylurea | Gliclazide OR Gliklazid OR Diamicron OR Diaglyk OR Glyade OR Diaikron OR Diabrezide OR Glimepiride OR Glimepiride OR Amaryl OR Amarel OR Gliquidone OR Glikvidon OR Glycvidon OR Glurenorm OR Beglynor OR Beglynora OR Glurenor OR Glipizide OR Glyburide OR Glypidizine OR Glidiazinamide OR Glydiazinamide OR Glucotrol OR Minidiab OR Mindiab OR Minodiab OR Melizide OR Ozidia OR Glupitel |
| TZDs | TZDs OR Thiazolidinediones OR Rosiglitazone OR Rosiglitazone Maleate OR Avandia OR Pioglitazone OR Pioglitazone Hydrochloride OR Actos |
| Glinides | Glinides OR Repaglinide OR Repa-glinide OR NovoNorm OR GlucoNorm OR Prandin OR Nateglinide OR Senaglinide OR Nate-Glinide OR Fastic OR Starsis OR Starlix OR Mitiglinide OR Miti-glinide |
| a-glycosidase inhibitors | a-glycosidase inhibitors OR Acarbose OR Glumida OR Glucobay OR Glucor OR Prandase OR Precose Voglibose OR Basen Miglitol OR Diastabol OR Plumarol OR Glyset |
| GLP1RA | Glucagon-Like Peptide-1 Receptor Agonists OR GLP-1 Receptor Agonists OR Exenatide OR Bydureon OR Exendin-4 OR Byetta OR Liraglutide OR Victoza OR Saxenda |
| SGLT2i | Sodium-glucose Co-transporter 2 Inhibitors OR SGLT-2 inhibitors OR Dapagliflozin OR Farxiga OR Forxiga OR Empagliflozin OR Jardiance OR Canagliflozin OR Invokana |
| Antidiabetic agents | Antidiabetic drugs OR Hypoglycemic agents OR Hypoglycemic drug |
| COVID-19 | COVID-19 OR COVID19 OR Coronavirus Disease 2019 OR 2019 novel coronavirus OR 2019-nCoV OR SARS-COV-2 |

**S Table 2.** Risk of bias assessment (Newcastle-Ottawa Quality Assessment Scale criteria).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Study | Selection | Comparability | Outcome | Quality score |
| Silverii, G. A (2021)[1] | \*\*\*\* | \* | \*\* | 7 |
| Kahkoska, A. R (2021)[2] | \*\*\*\* | \*\* | \*\* | 8 |
| Ramos-Rincón, J. M (2021)[3] | \*\*\*\* | \* | \*\* | 7 |
| Orioli, L (2021)[4] | \*\*\*\* | \*\* | \*\* | 8 |
| Israelsen, S. B (2021)[5] | \*\*\*\* | \*\* | \*\* | 8 |
| Sourij, H (2021)[6] | \*\*\*\* | \*\* | \*\* | 8 |
| Nyland, J. E (2021)[7] | \*\*\*\* | \*\* | \*\* | 8 |
| Cheng, X (2021)[8] | \*\*\*\* | \*\* | \*\* | 8 |
| Elibol, A (2021)[9] | \*\*\*\* | \*\* | \*\* | 8 |
| Luk, A. O. Y (2021)[10] | \*\*\*\* | \*\* | \*\* | 8 |
| Li, J (2021)[11] | \*\*\*\* | \* | \*\* | 7 |
| Lally, M. A (2021)[12] | \*\*\*\* | \*\* | \*\* | 8 |
| Crouse, A. B (2020)[13] | \*\*\*\* | \*\* | \*\* | 8 |
| Pérez-Belmonte, L. M (2020)[14] | \*\*\*\* | \*\* | \*\* | 8 |
| Wargny, M (2021)[15] | \*\*\*\* | \*\* | \*\* | 8 |
| Khunti, K (2021)[16] | \*\*\*\* | \*\* | \*\* | 8 |
| Solerte, S. B (2020)[17] | \*\*\*\* | \*\* | \*\* | 8 |
| Meijer, R. I (2021)[18] | \*\*\*\* | \*\* | \*\* | 8 |
| Cheng X (2020)[19] | \*\*\*\* | \*\* | \*\* | 8 |
| Luo P (2020)[20] | \*\*\*\* | \*\* | \*\* | 8 |
| Bramante CT (2021)[21] | \*\*\*\* | \*\* | \*\* | 8 |
| Ghany R (2021)[22] | \*\*\*\* | \* | \*\* | 7 |
| Jiang N (2021)[23] | \*\*\*\* | \*\* | \*\* | 8 |
| Lalau J D (2021)[24] | \*\*\*\* | \*\* | \*\* | 8 |
| Oh T K (2021)[25] | \*\*\*\* | \*\* | \*\* | 8 |
| Bramante CT2 (2021)[26] | \*\*\*\* | \*\* | \*\* | 8 |
| Chen Y (2020)[27] | \*\*\*\* | \*\* | \*\* | 8 |
| Do JY (2020)[28] | \*\*\*\* | \*\* | \*\* | 8 |
| Gao Y (2020)[29] | \*\*\*\* | \* | \*\* | 7 |
| Kim MK (2020)[30] | \*\*\*\* | \*\* | \*\* | 8 |
| Saygili ES (2021)[31] | \*\*\*\* | \*\* | \*\* | 8 |
| Wander PL (2021)[32] | \*\*\*\* | \* | \*\* | 7 |
| Tamura RE (2021)[33] | \*\*\*\* | \*\* | \*\* | 8 |
| Dave JA (2021)[34] | \*\*\*\* | \* | \*\* | 7 |
| Cariou B (2020)[35] | \*\*\*\* | \*\* | \*\* | 8 |
| Fadini GP (2020)[36] | \*\*\*\* | \* | \*\* | 7 |
| Rhee SY (2021)[37] | \*\*\*\* | \*\* | \*\* | 8 |
| Dalan R (2021)[38] | \*\*\*\* | \*\* | \*\* | 8 |
| Noh Y (2021)[39] | \*\*\*\* | \*\* | \*\* | 8 |
| Roussel R (2021)[40] | \*\*\*\* | \*\* | \*\* | 8 |
| Zhou JH (2020)[41] | \*\*\*\* | \*\* | \*\* | 8 |
| Kosiborod MN (2021)[42] | \*\*\*\* | \*\* | \*\*\* | 9 |

**S Table 3.** Assessment of model fit. If the difference of DIC value in two modes is within 5, it means that the data is consistent.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Outcome** | **Consistency model** | | | | | **Inconsistency model** | | | | |
| Data points | Residual deviance | Ratio | I2 | DIC | Data points | Residual deviance | Ratio | I2 | DIC |
| Mortality | 74 | 73.33 | 0.99 | 0.5% | 123.05 | 74 | 71.06 | 0.96 | 0% | 123.36 |

Abbreviation: DIC, deviance information criterion.

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