SUPPLEMENTARY MATERIAL 5: Post-Covid Conditions in Adults: a Systematic Review and Meta-analysis of controlled studies

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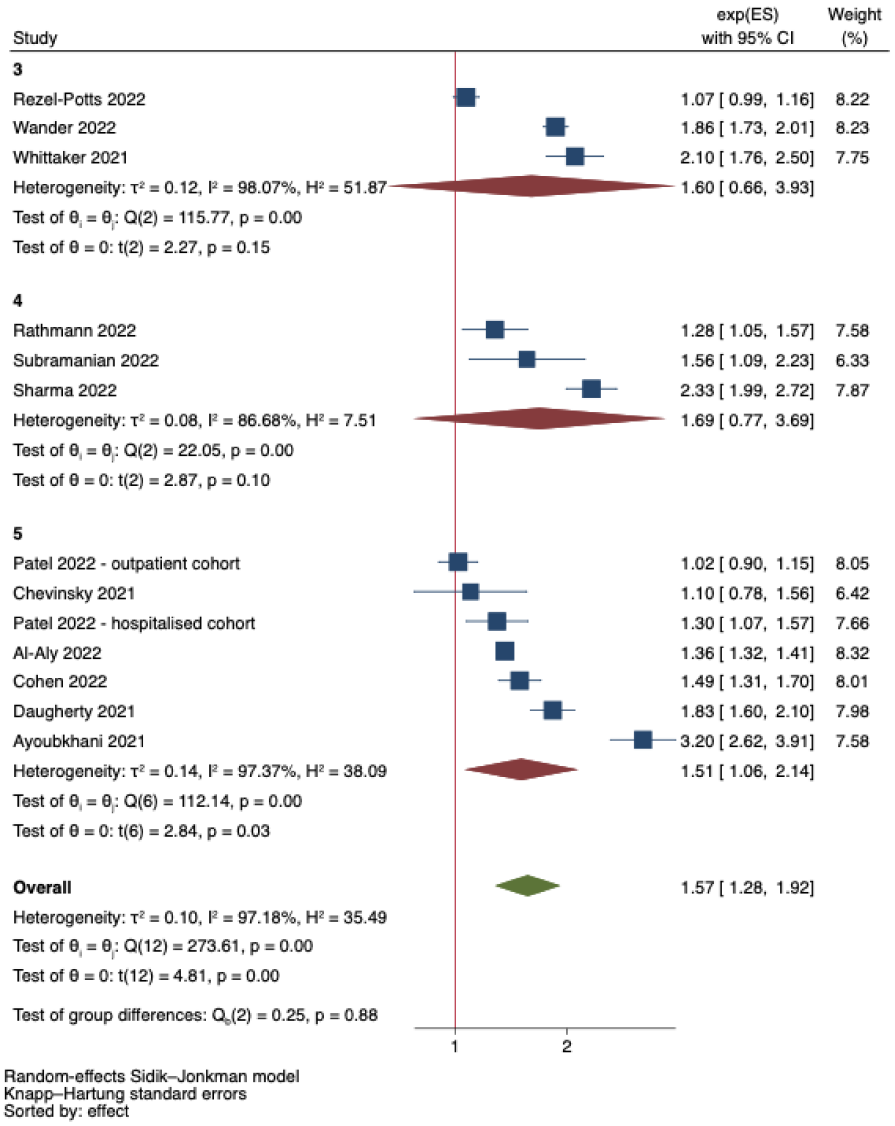
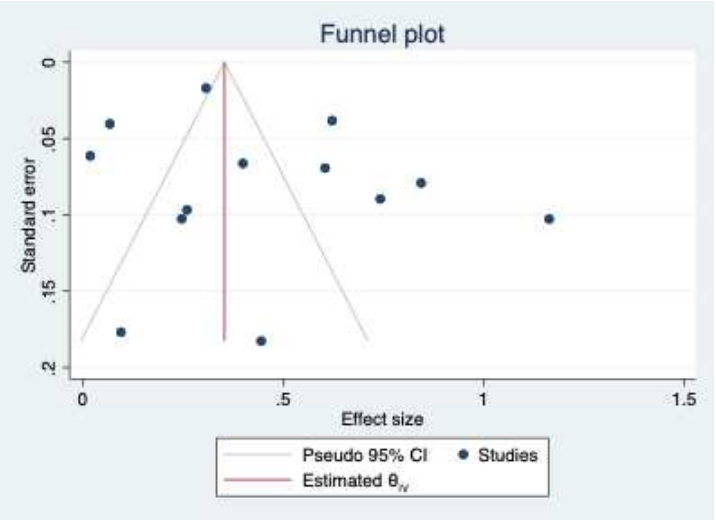
Analyses: Incident medical diagnosis stratified by number of core confounders

Analysis 1.1. Incidence of Diabetes



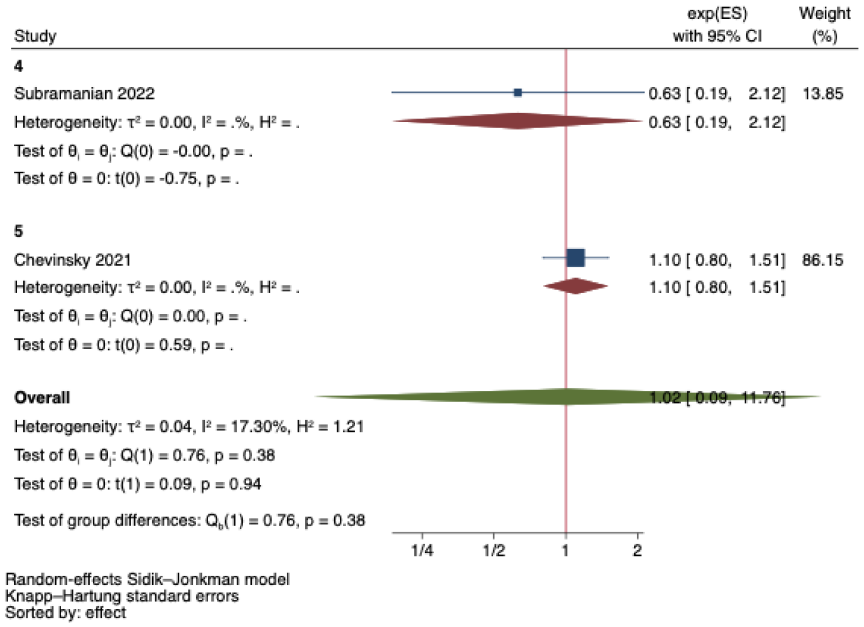
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.



Publication bias (Egger)

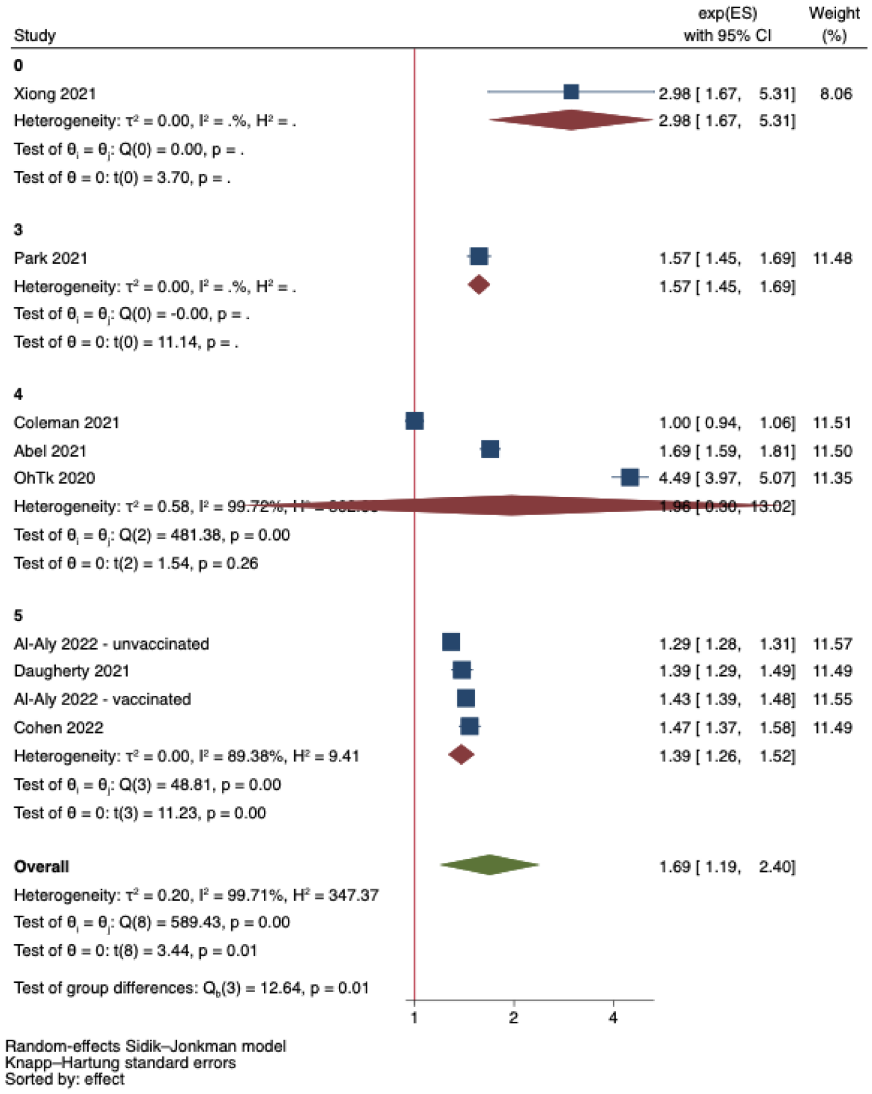
```
H0: beta1 = 0; no small-study effects
            beta1 =      0.26
      SE of beta1 =     2.153
                z =      0.12
       Prob > |z| =    0.9049
```

Analysis 1.2. Incidence of Thyroid Disorders



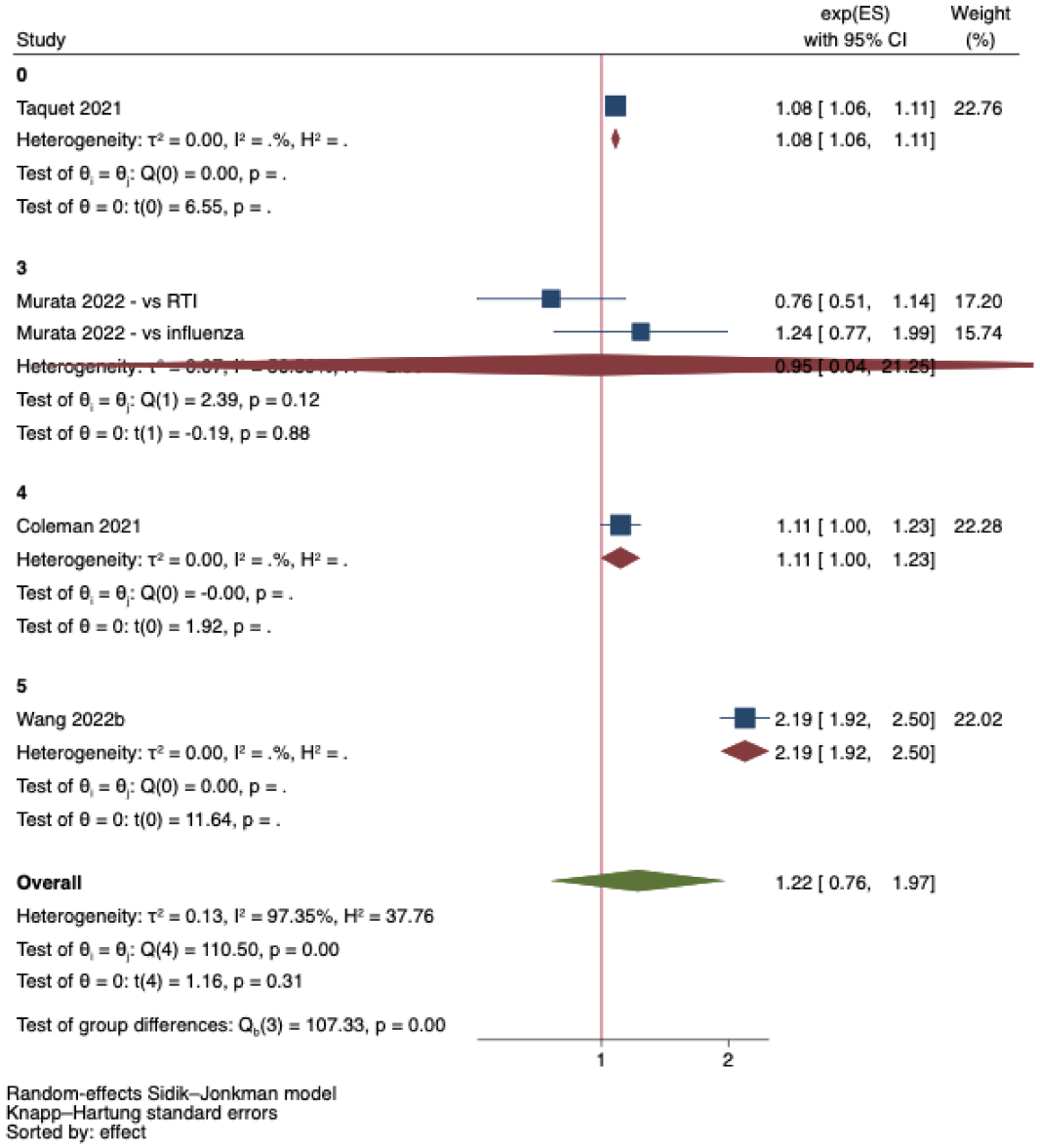
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 2.1. Any Psychiatric Disorder



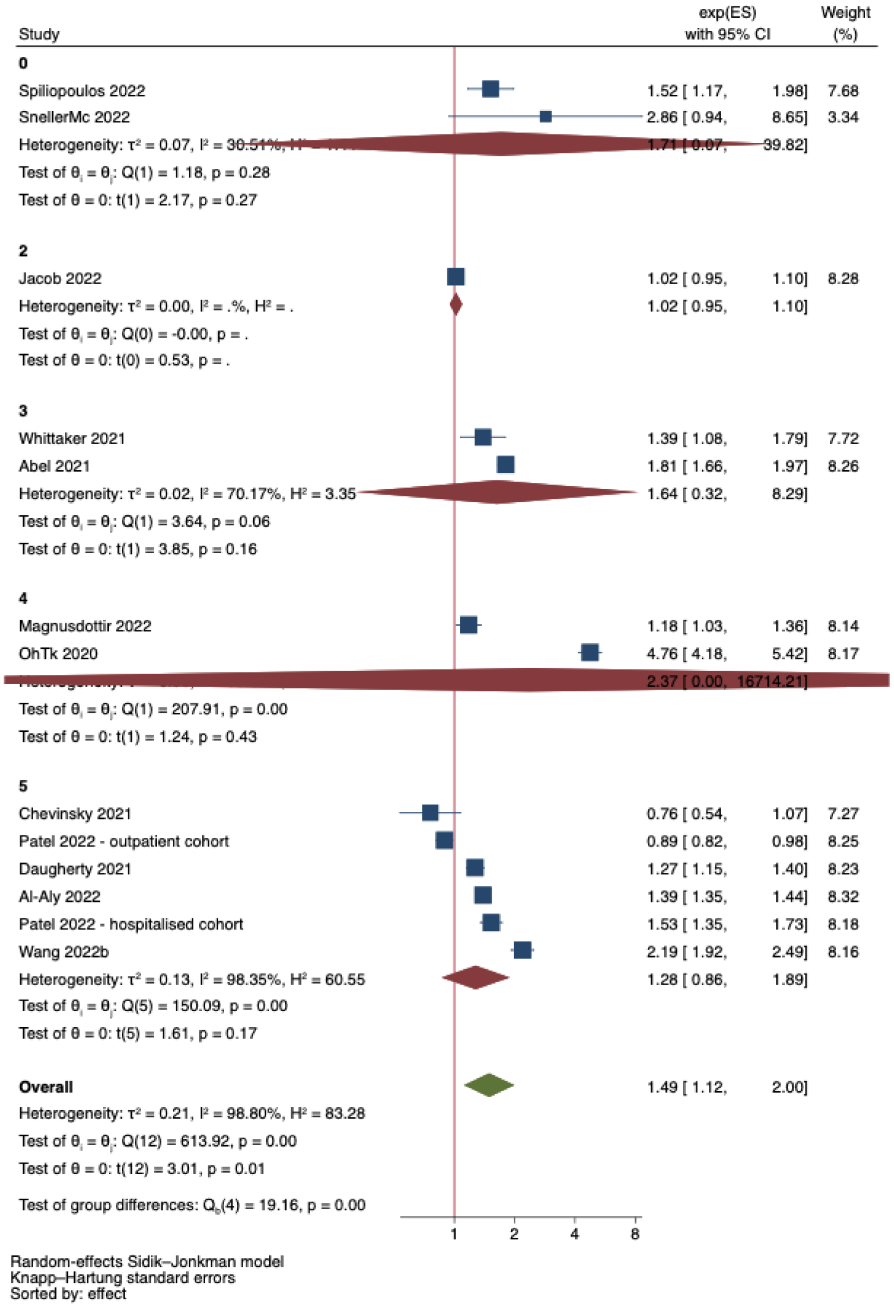
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 2.2. Mood Disorders

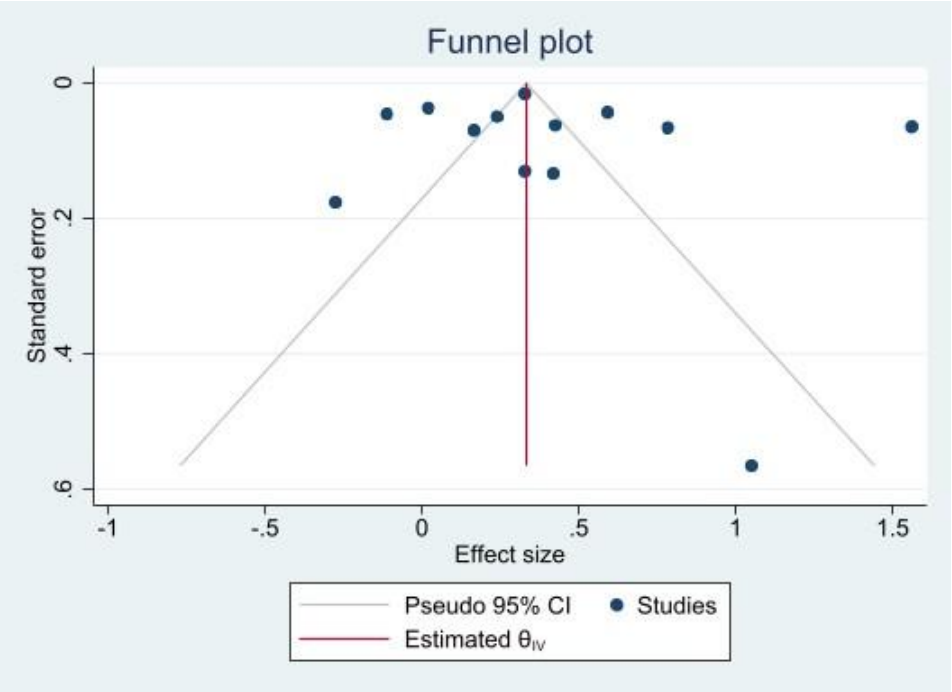


Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 2.3. Depressive Disorder



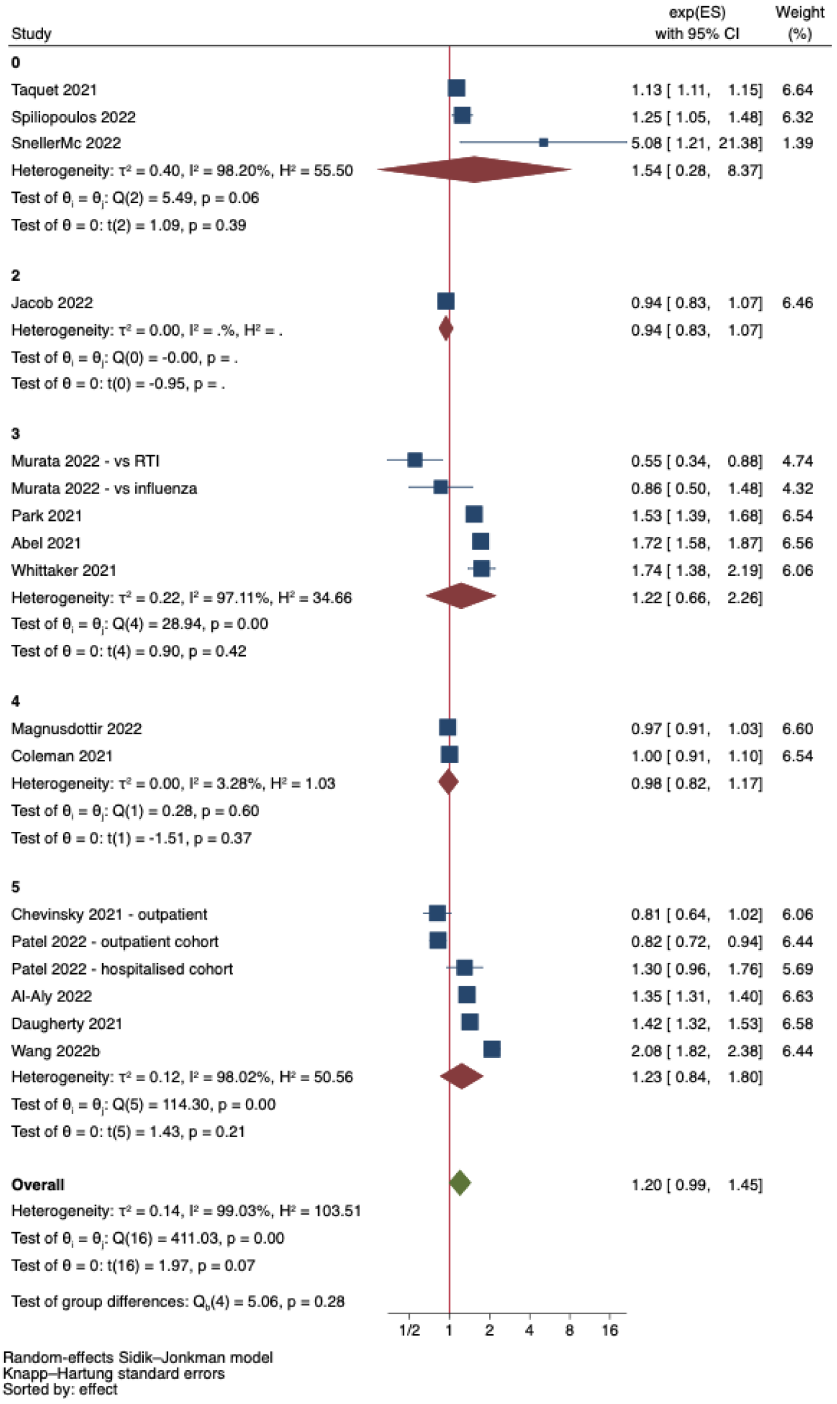
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.



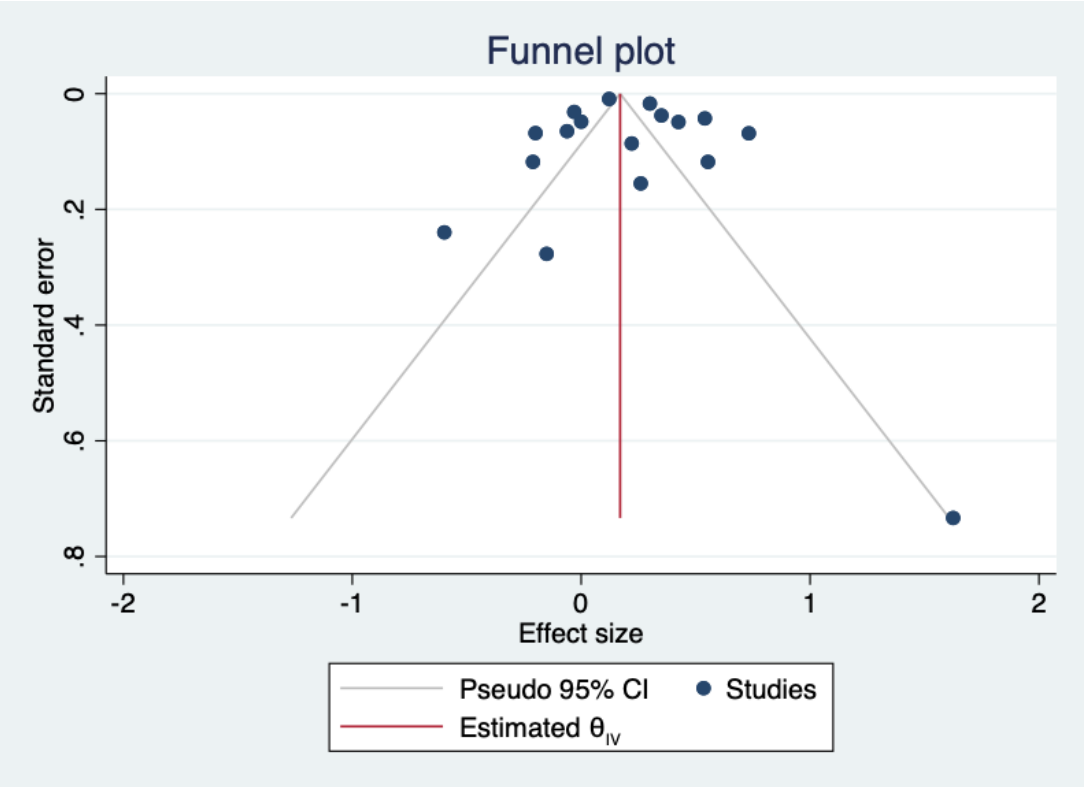
Publication bias (Egger)

```
H0: beta1 = 0; no small-study effects
            beta1 =      0.73
       SE of beta1 =     1.380
                 z =      0.53
        Prob > |z| =    0.5980
```

Analysis 2.4 Anxiety Disorder



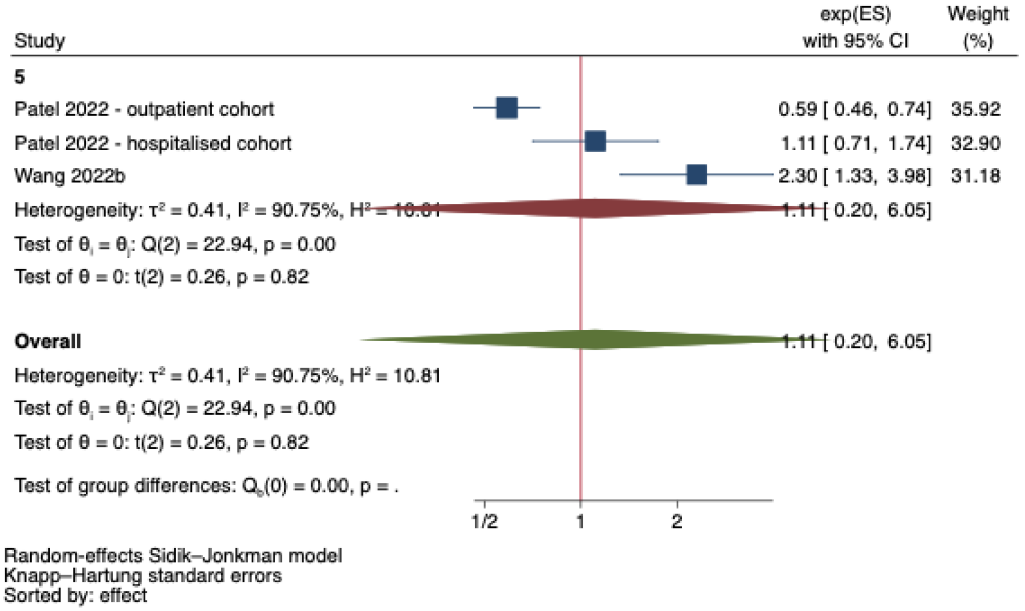
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.



Publication bias (Egger)

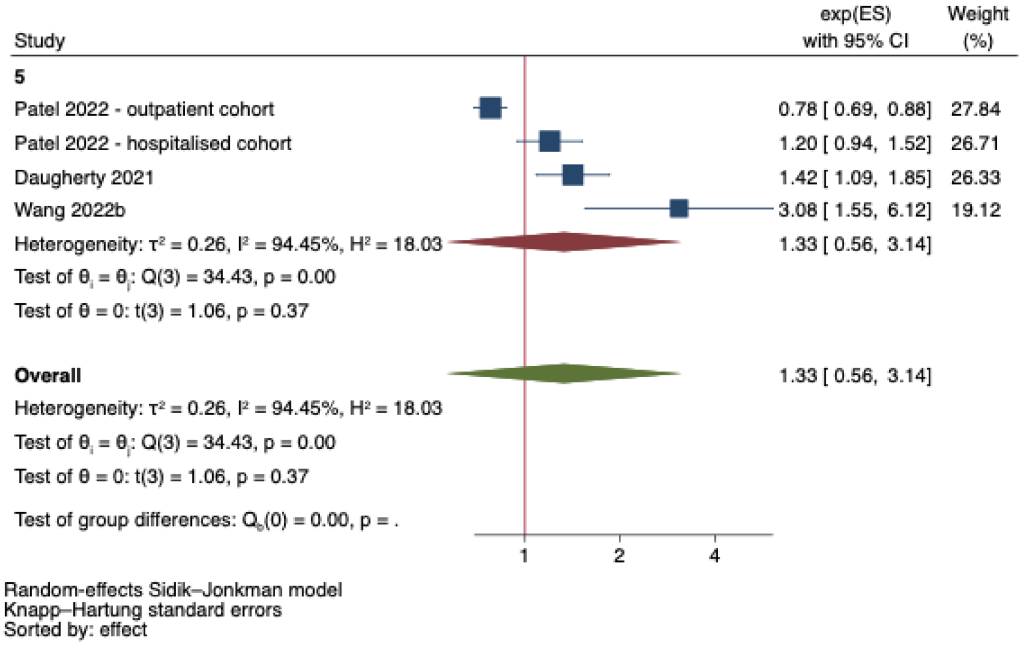
```
H0: beta1 = 0; no small-study effects
            beta1 =      0.39
       SE of beta1 =     0.964
                 z =      0.40
        Prob > |z| =    0.6870
```

Analysis 2.5. Panic Disorder



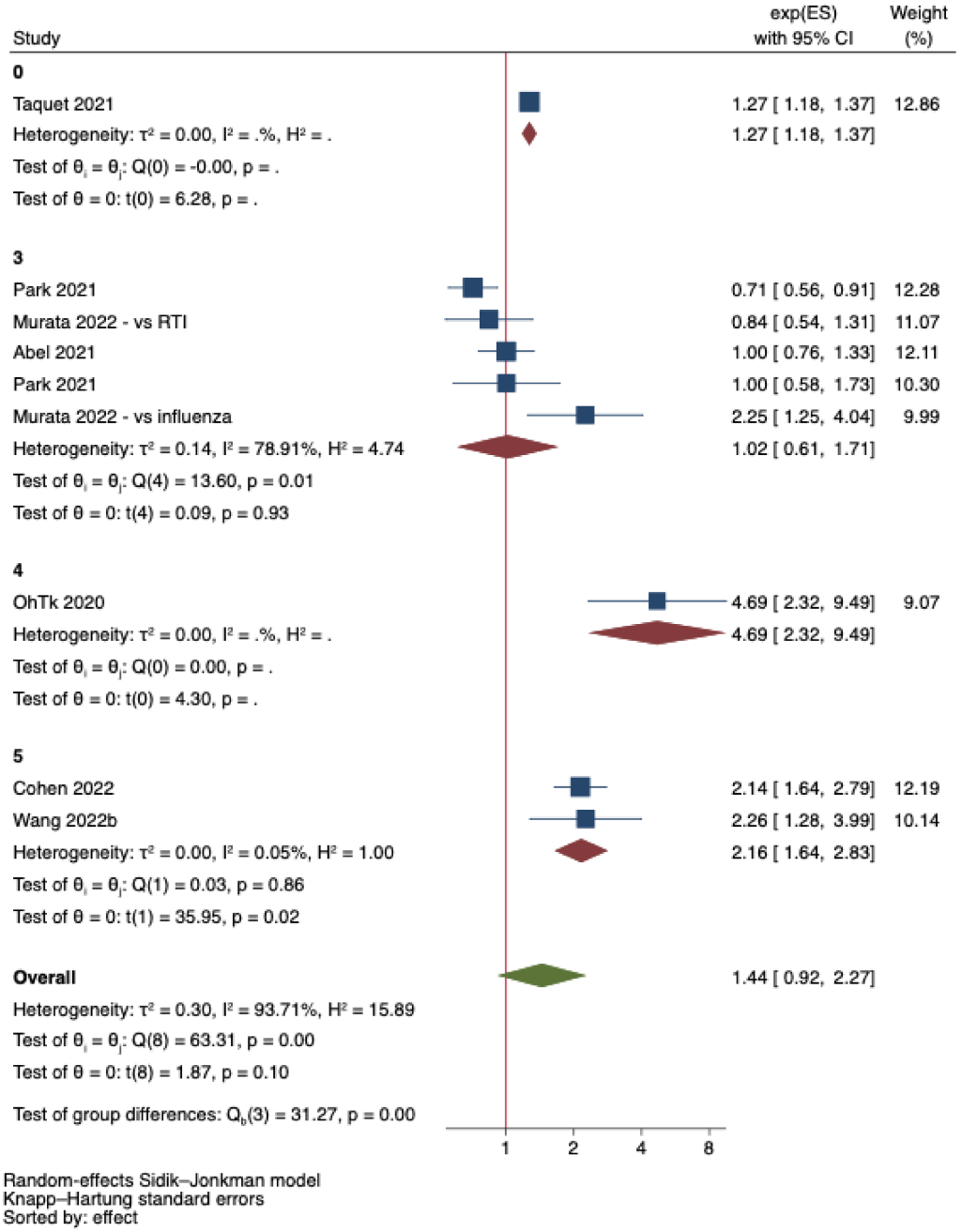
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 2.6 Post-Traumatic Stress Disorder



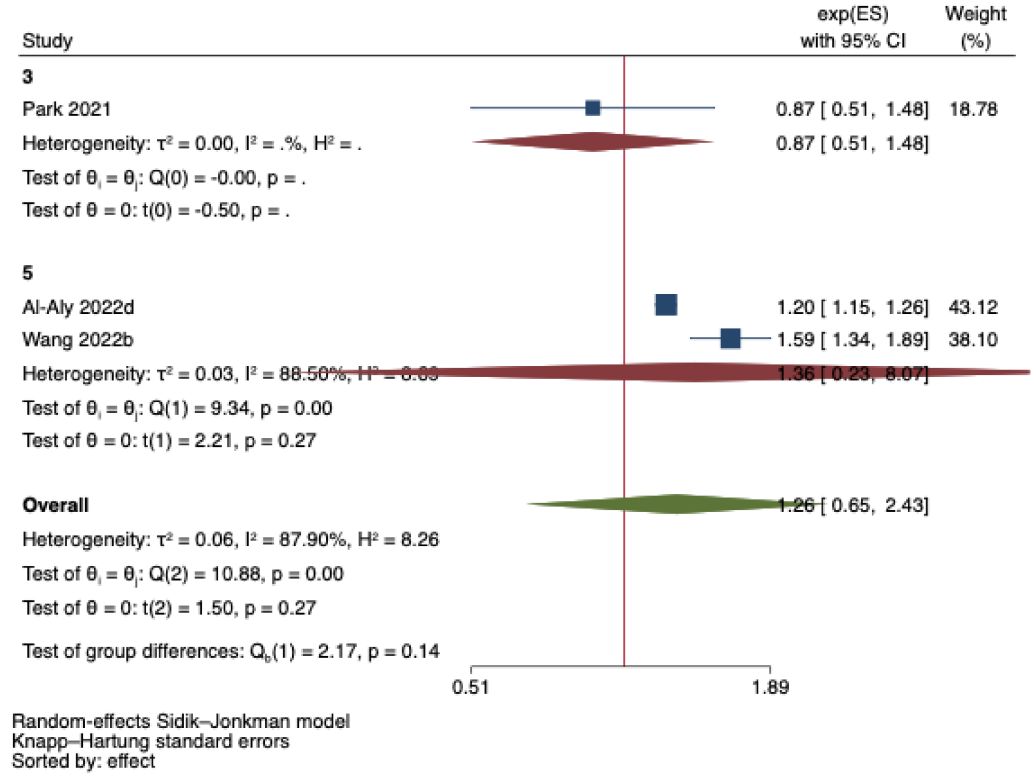
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 2.7 Psychosis



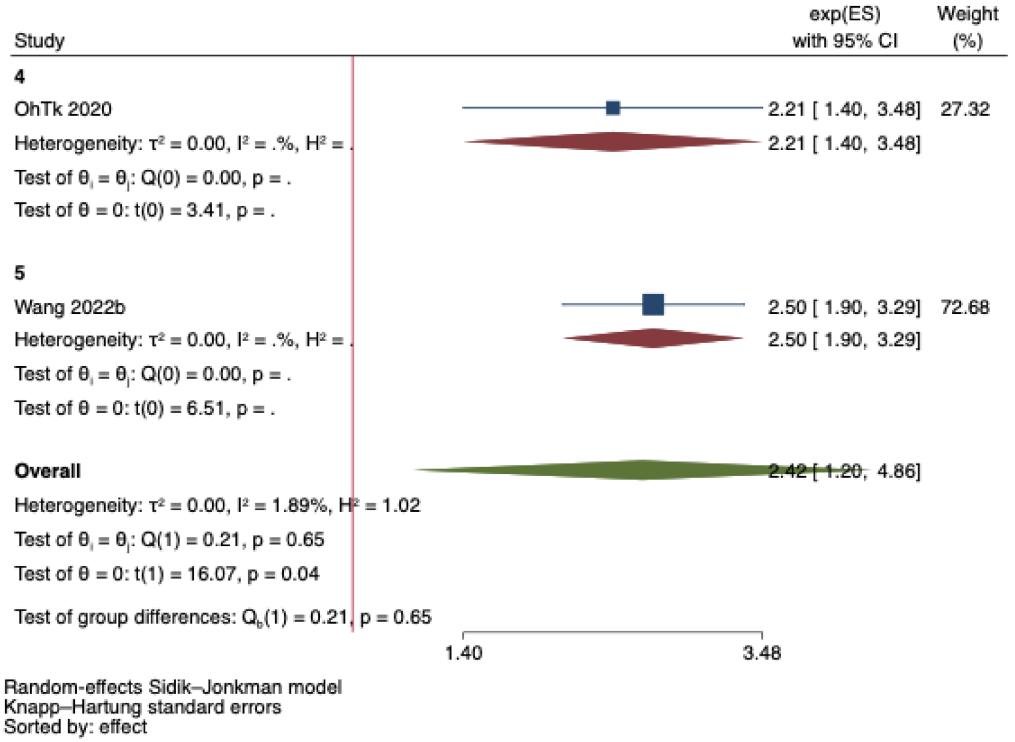
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 2.8 Any Substance Abuse Disorder



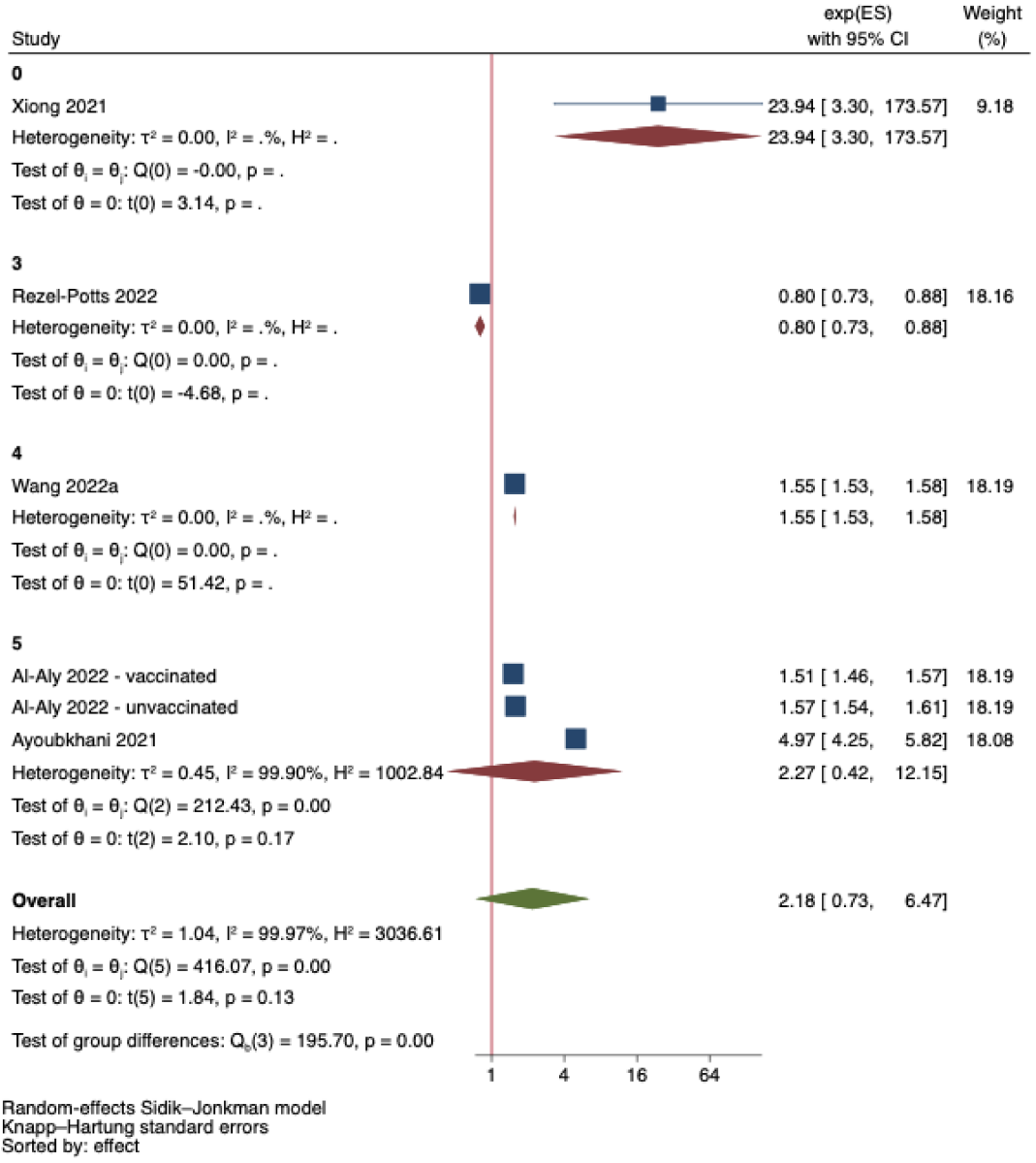
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 2.9 Alcohol Abuse Disorder



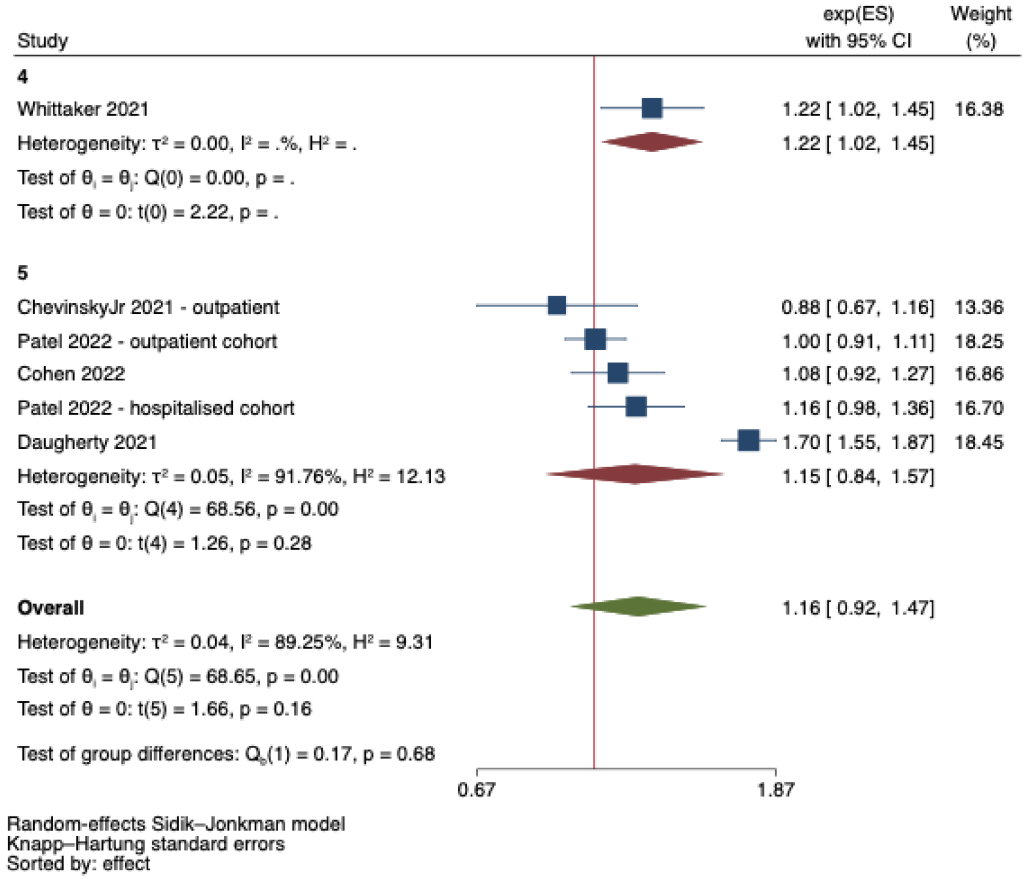
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 3.1 Any cardiovascular disorder



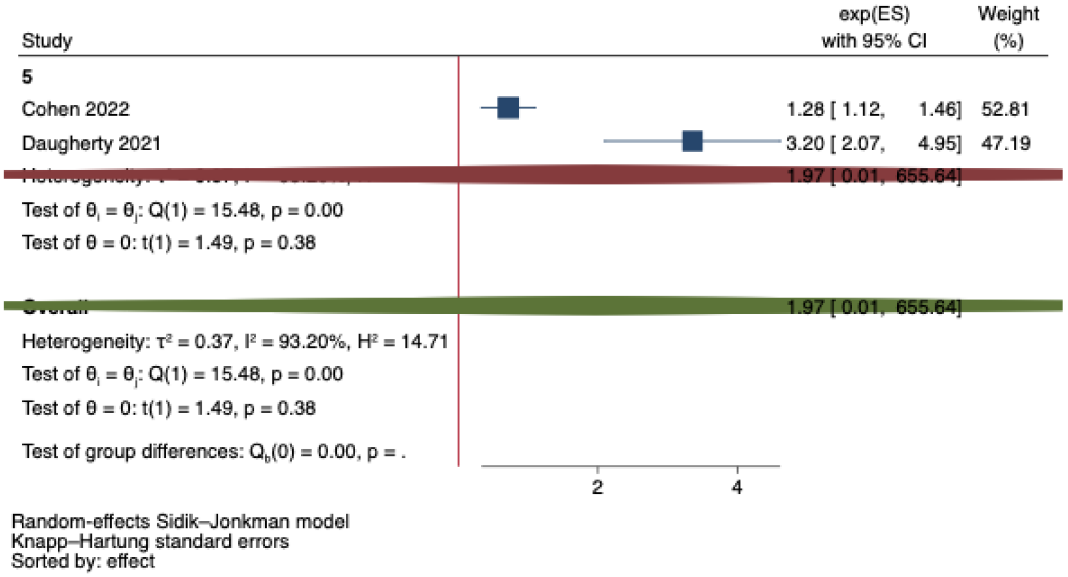
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 3.2 Hypertension



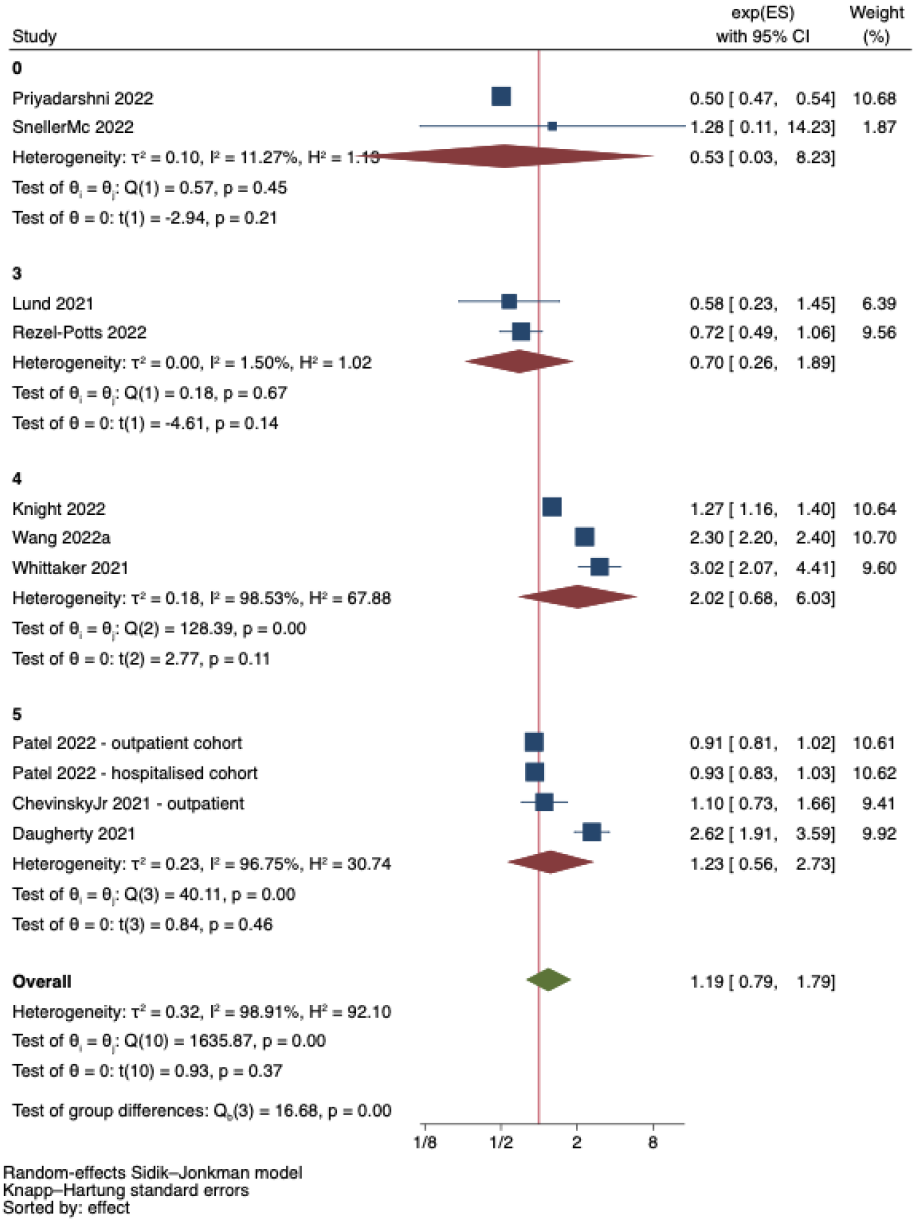
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 3.3 Pulmonary Hypertension

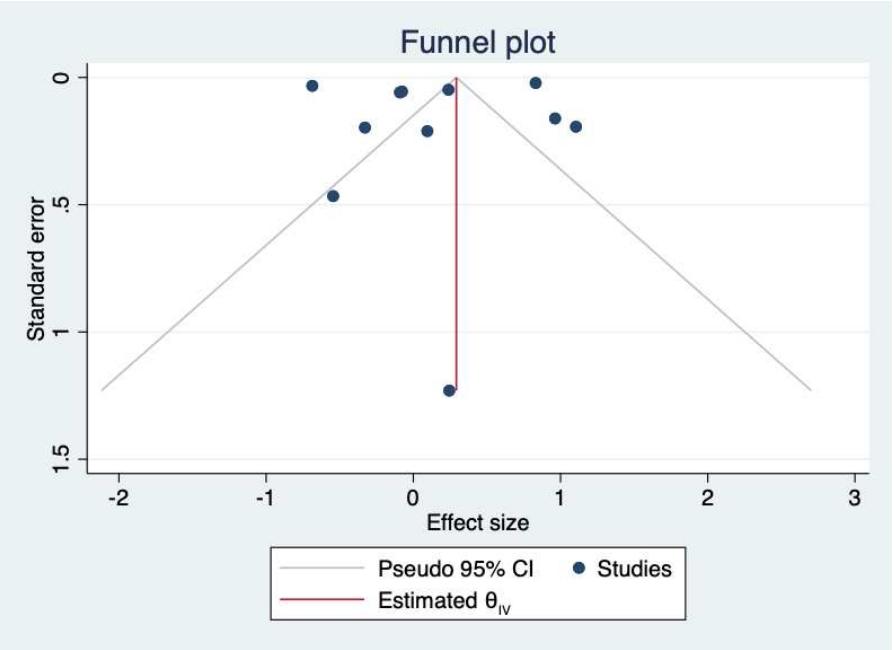


Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 3.4 Heart Failure



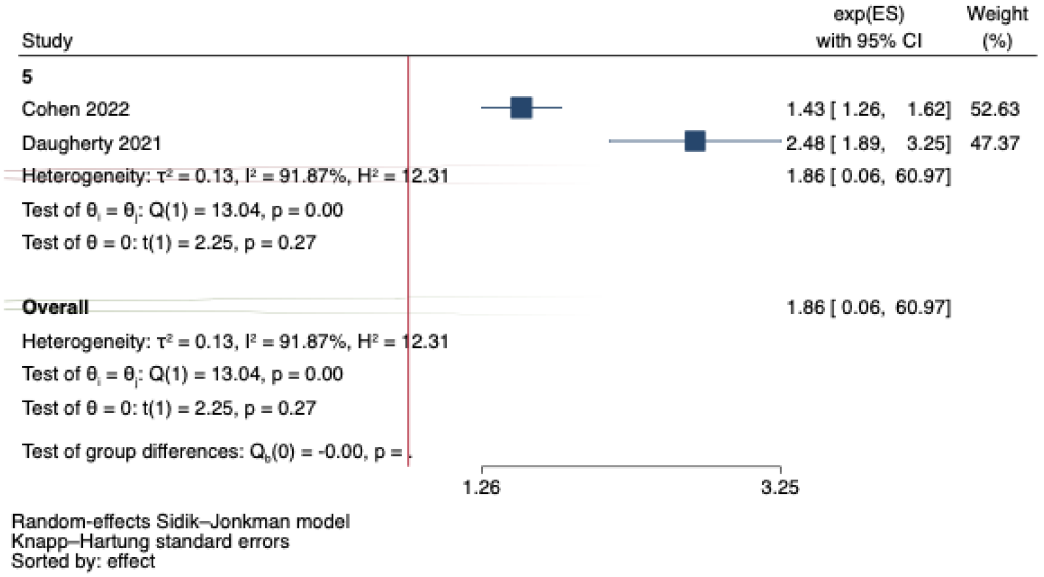
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.



Publication bias (Egger)

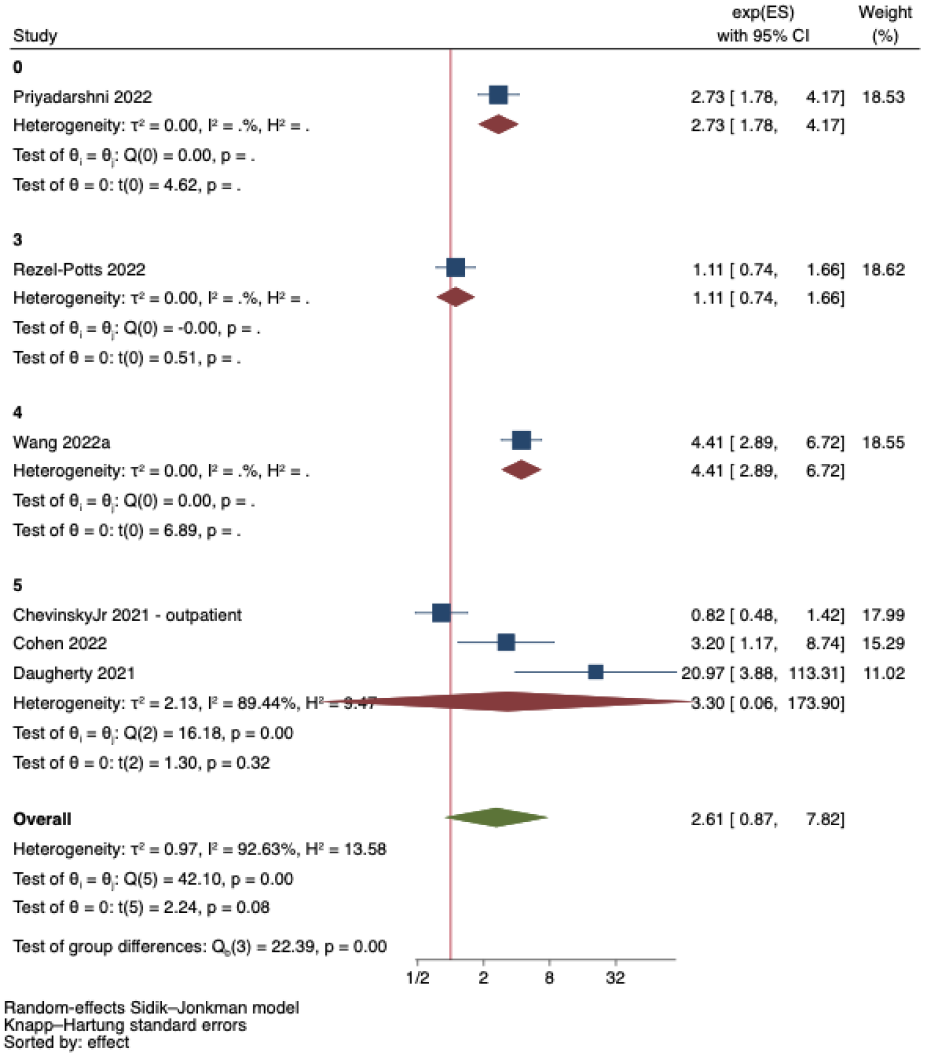
```
H0: beta1 = 0; no small-study effects
            beta1 =     -0.14
      SE of beta1 =     1.010
                z =     -0.14
       Prob > |z| =    0.8870
```

Analysis 3.5 Postural tachycardia syndrome (POTS)



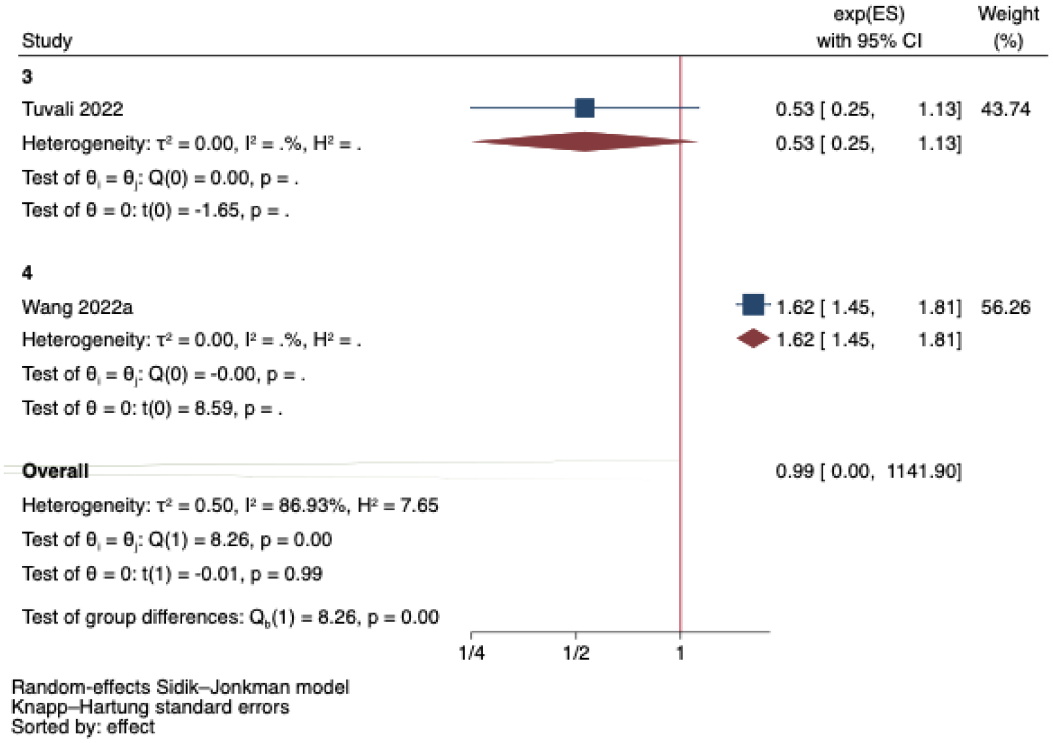
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 3.6. Myocarditis



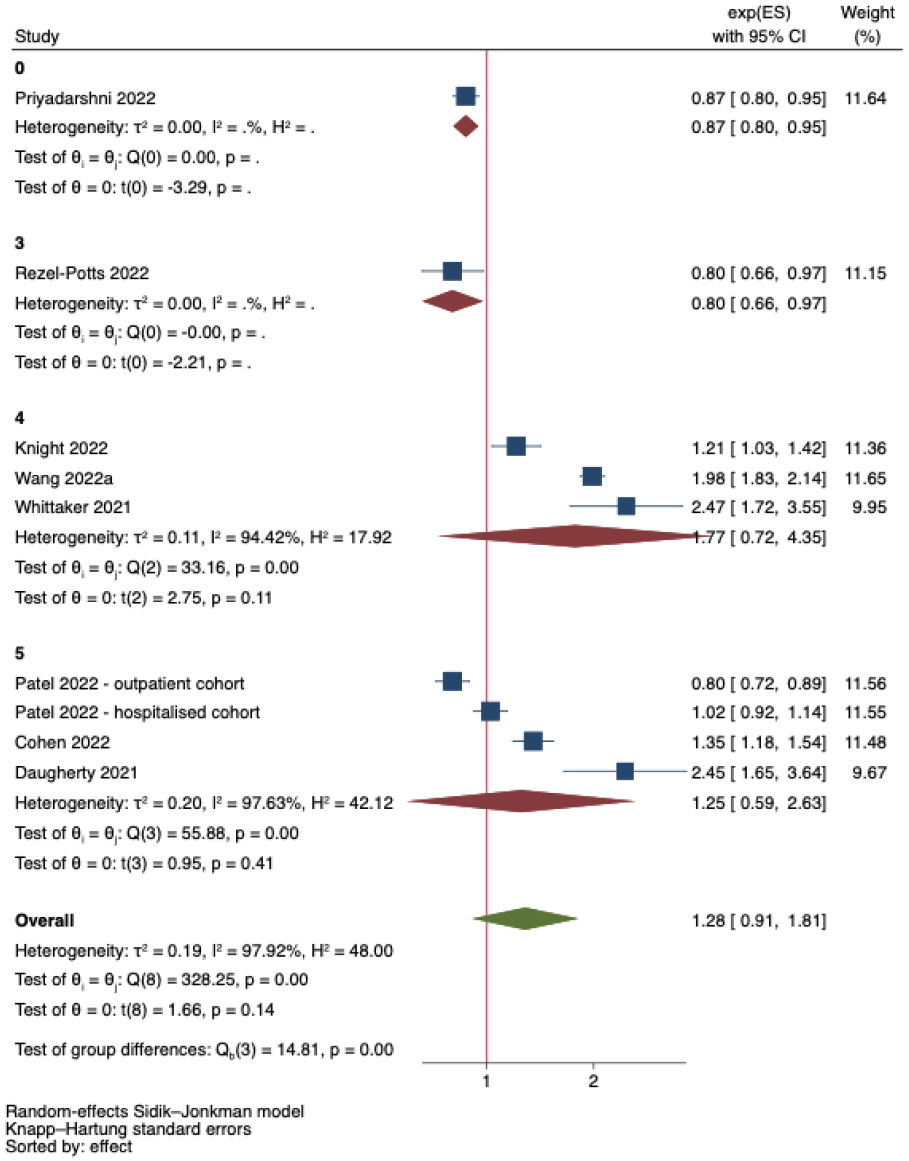
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 3.7 Pericarditis



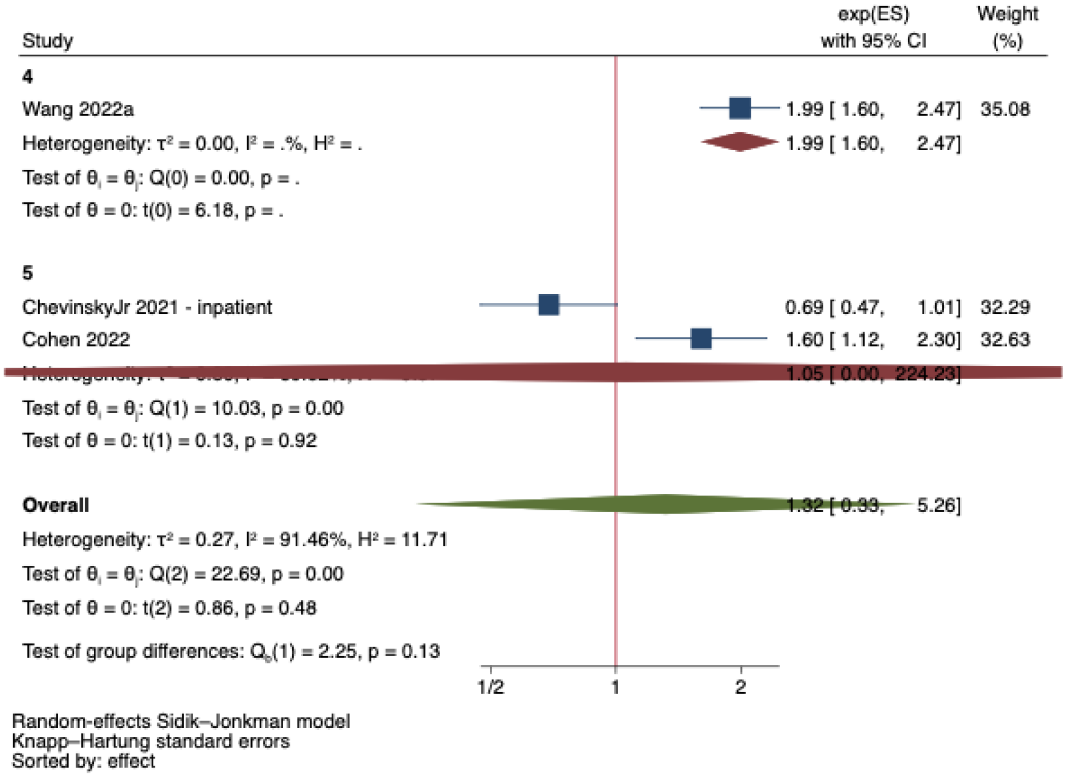
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 3.8 Myocardial infarction



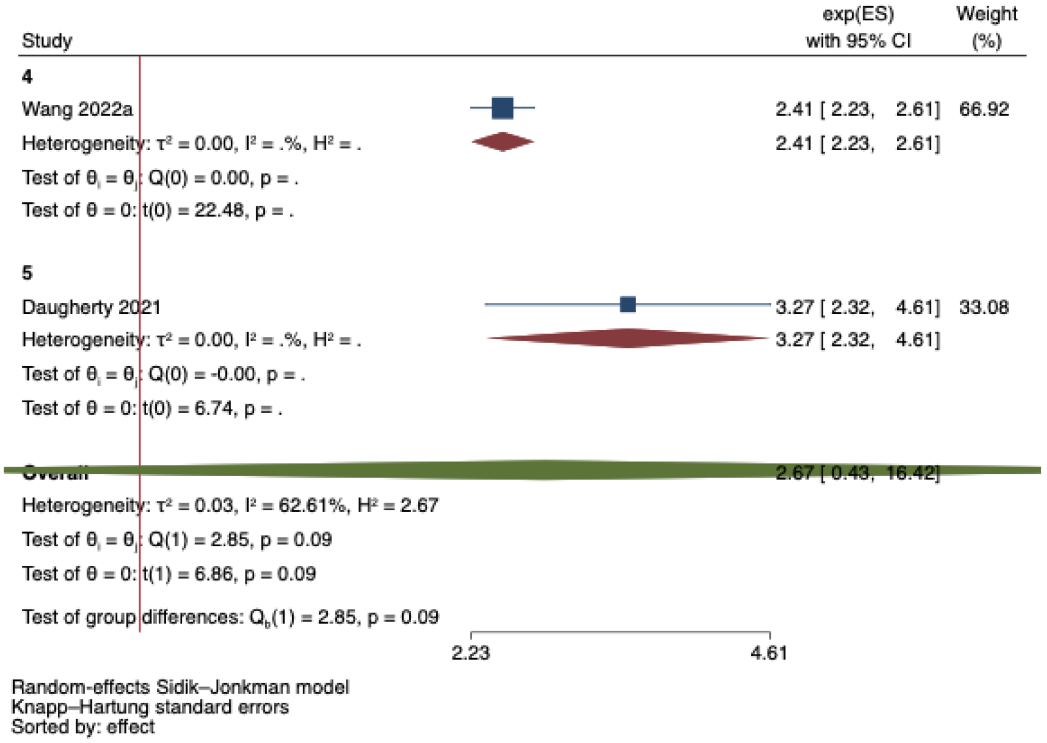
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 3.9 Cardiogenic shock



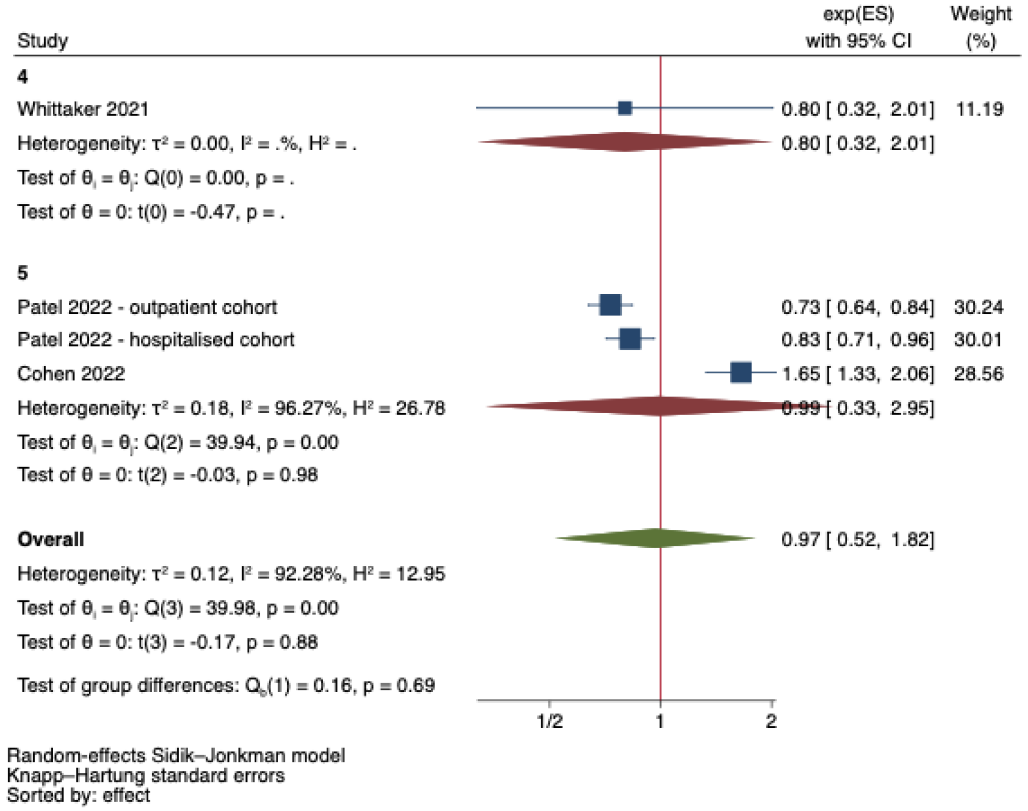
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 3.10 Cardiomyopathy



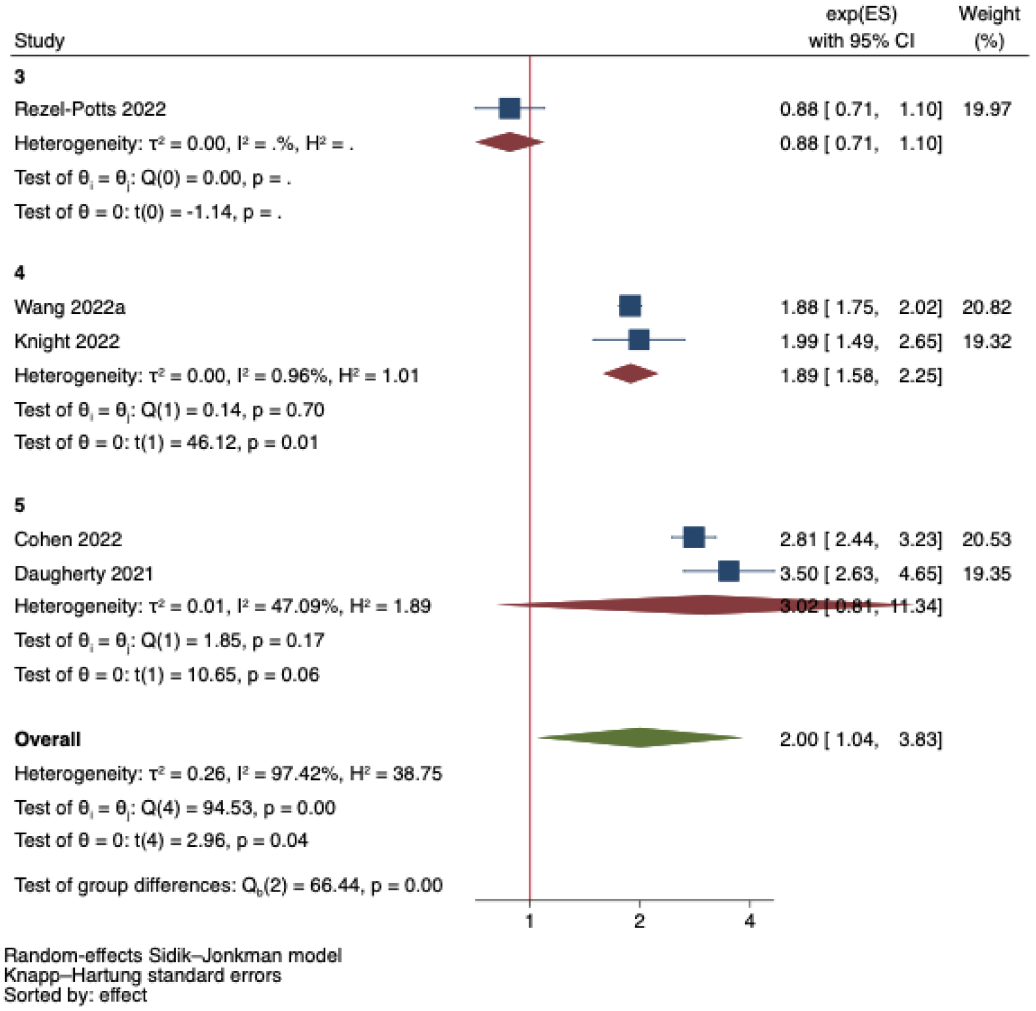
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 3.11 Peripheral artery disease



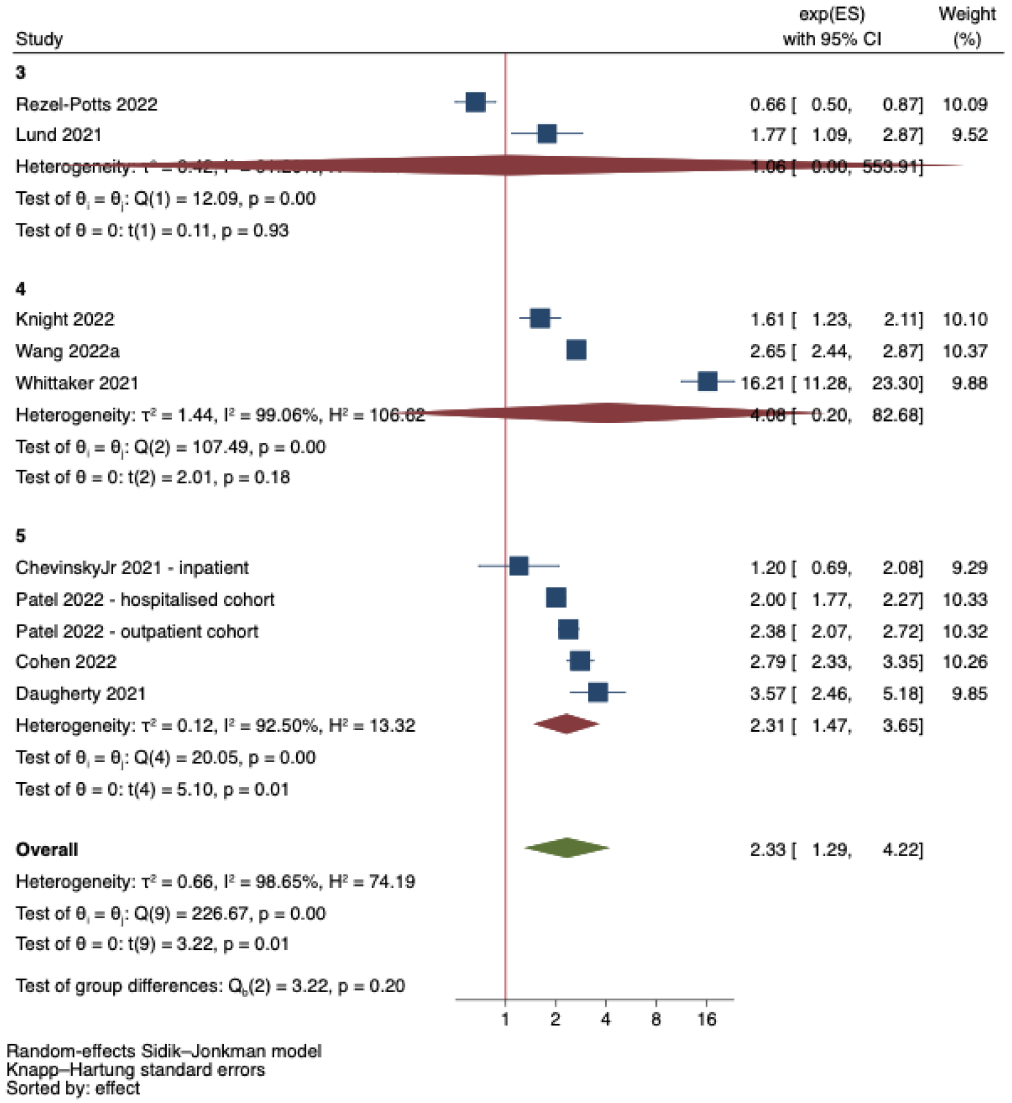
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 3.12 Deep vein thrombosis

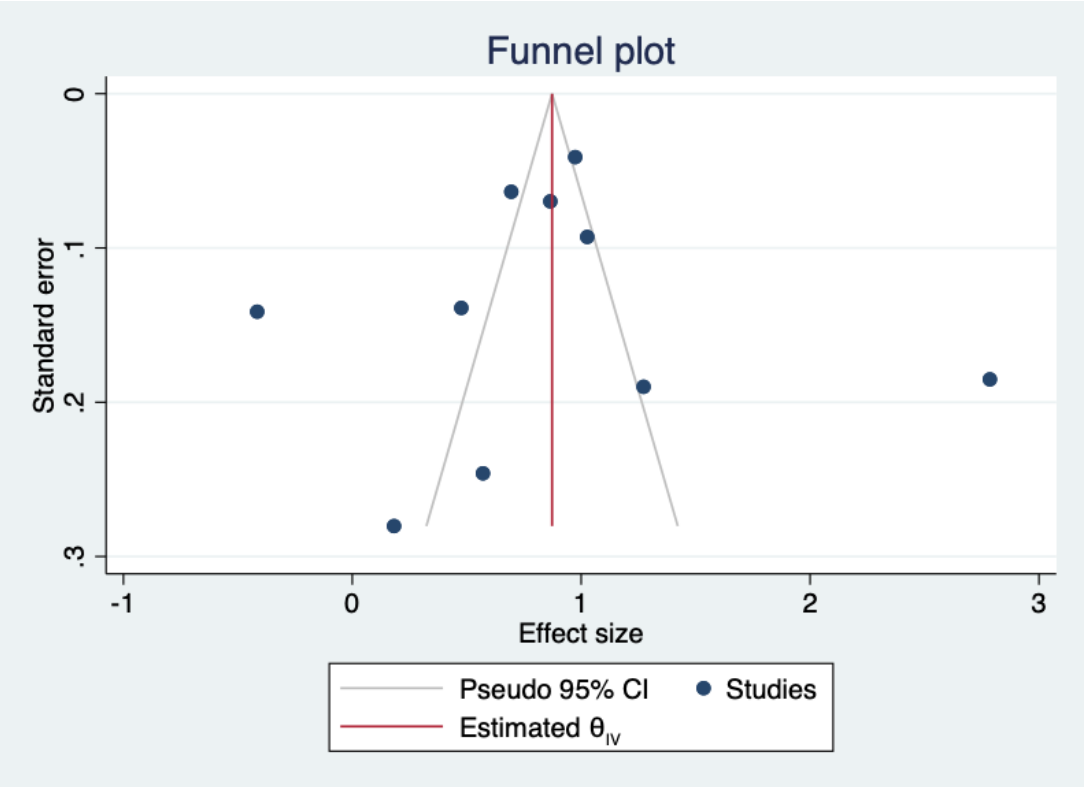


Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 3.13 Pulmonary embolism



Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.



Publication bias (Egger)

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H0: beta1 = 0; no small-study effects
            beta1 =     -0.35
       SE of beta1 =     3.665
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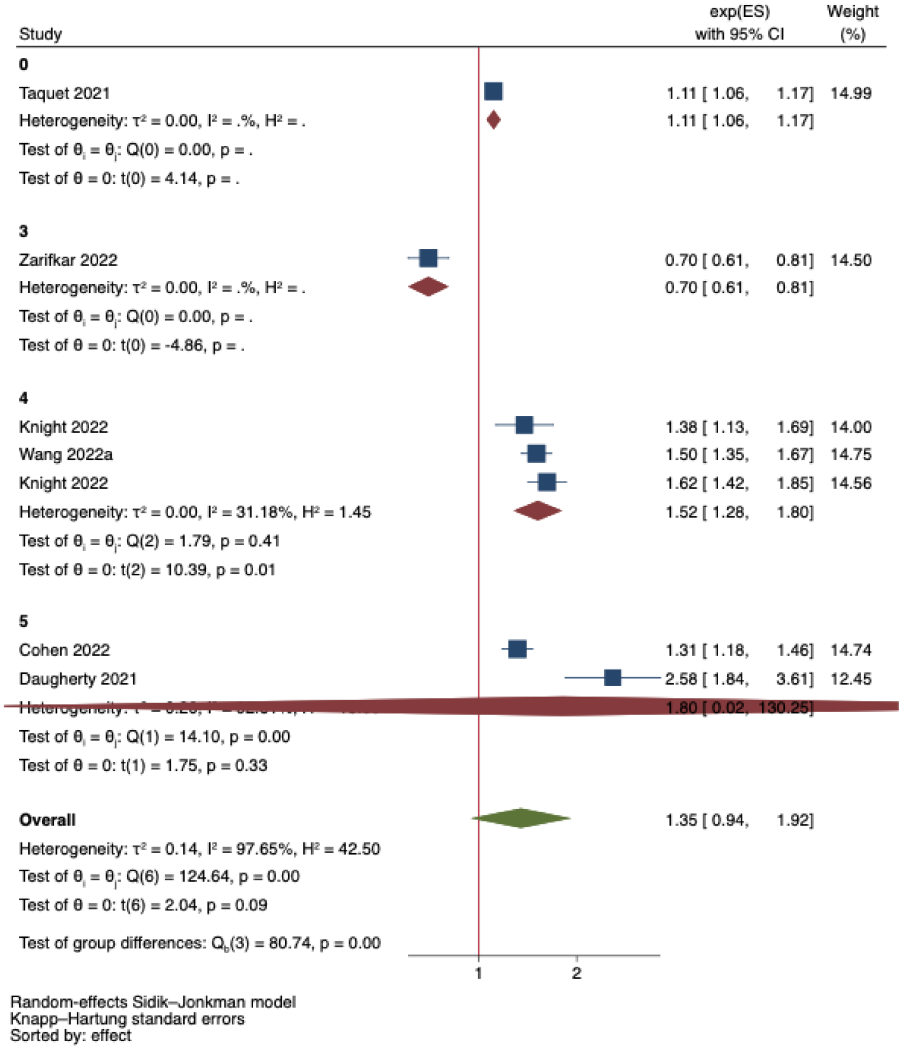
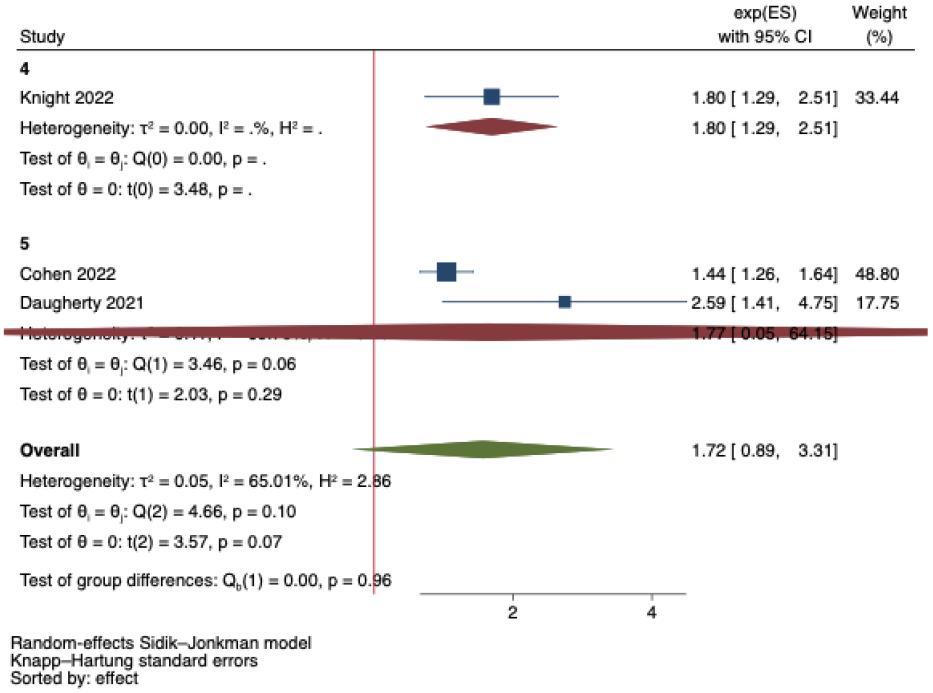
        Prob > |z| =    0.9247
```

Analysis 3.14 Ischemic stroke



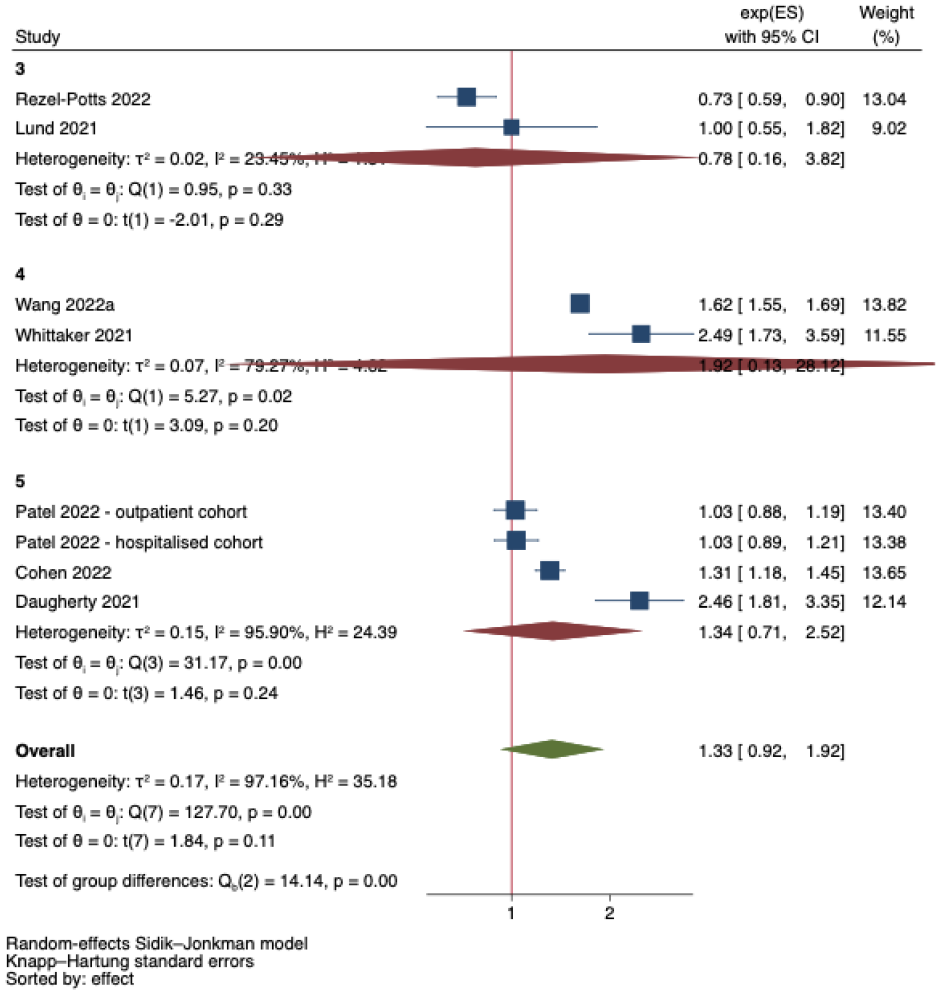
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 3.15 Hemorrhagic stroke



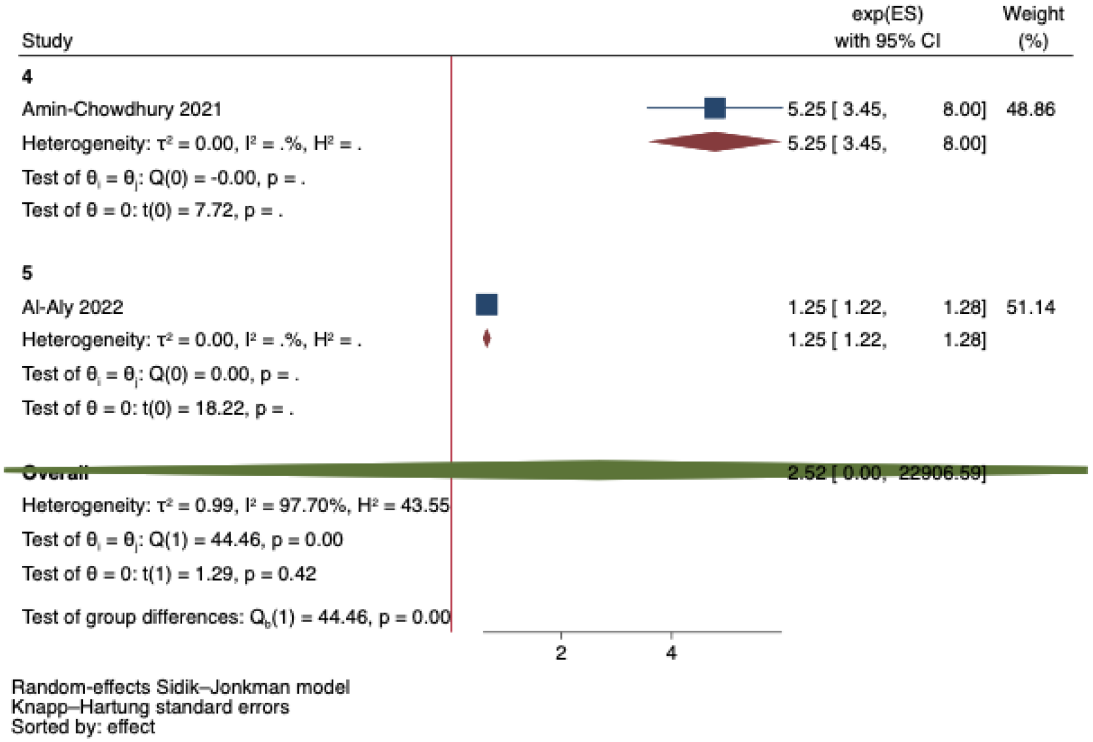
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 3.16 Stroke (global)



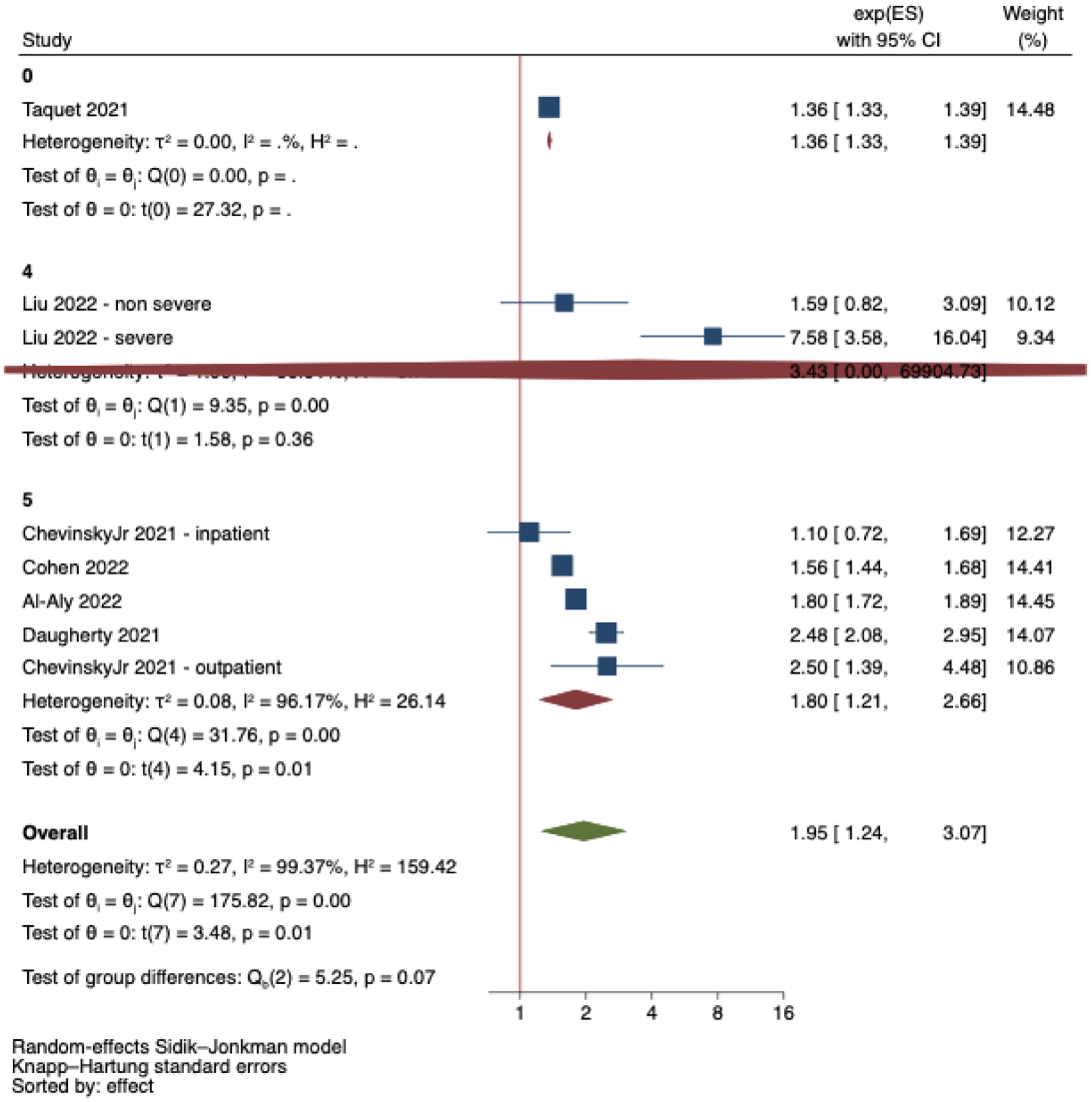
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 4.1 Sensory disorder



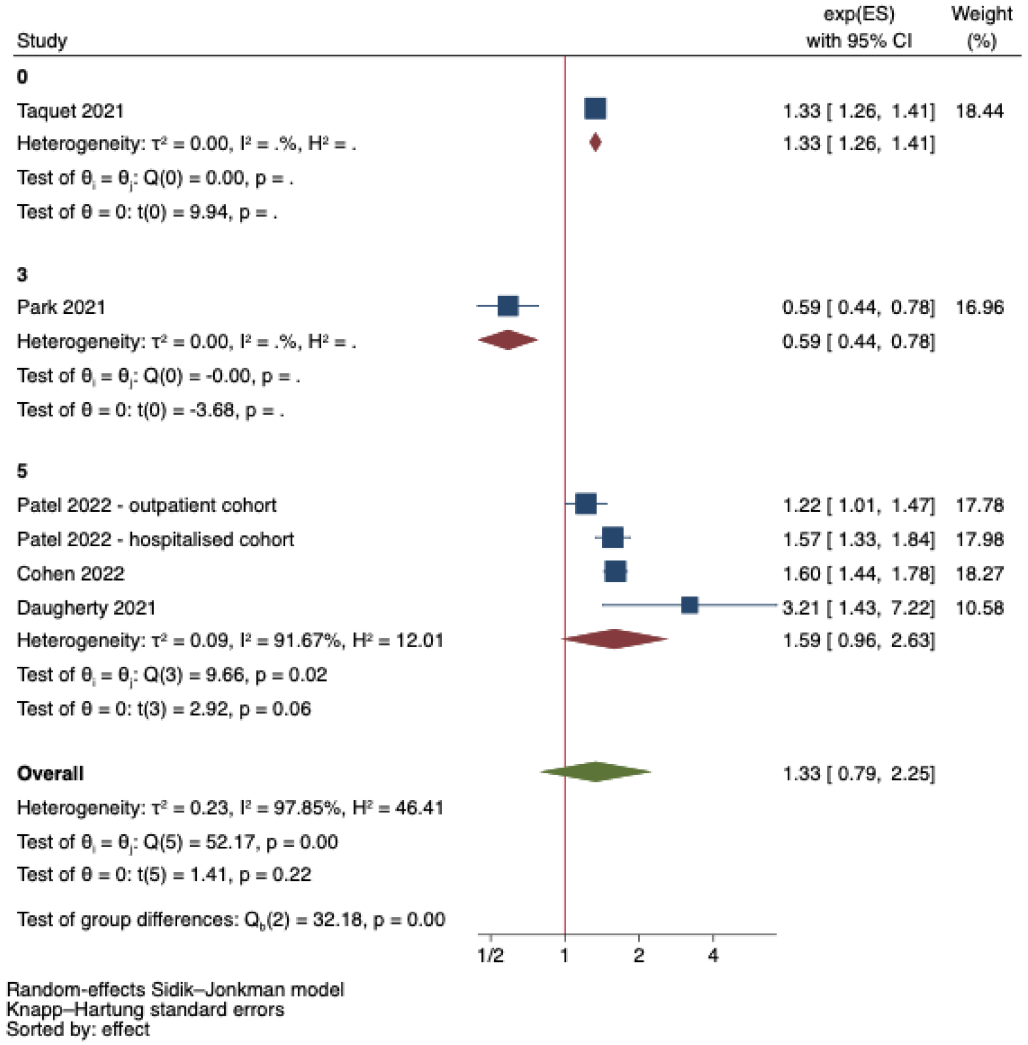
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 4.2 Cognitive Impairment



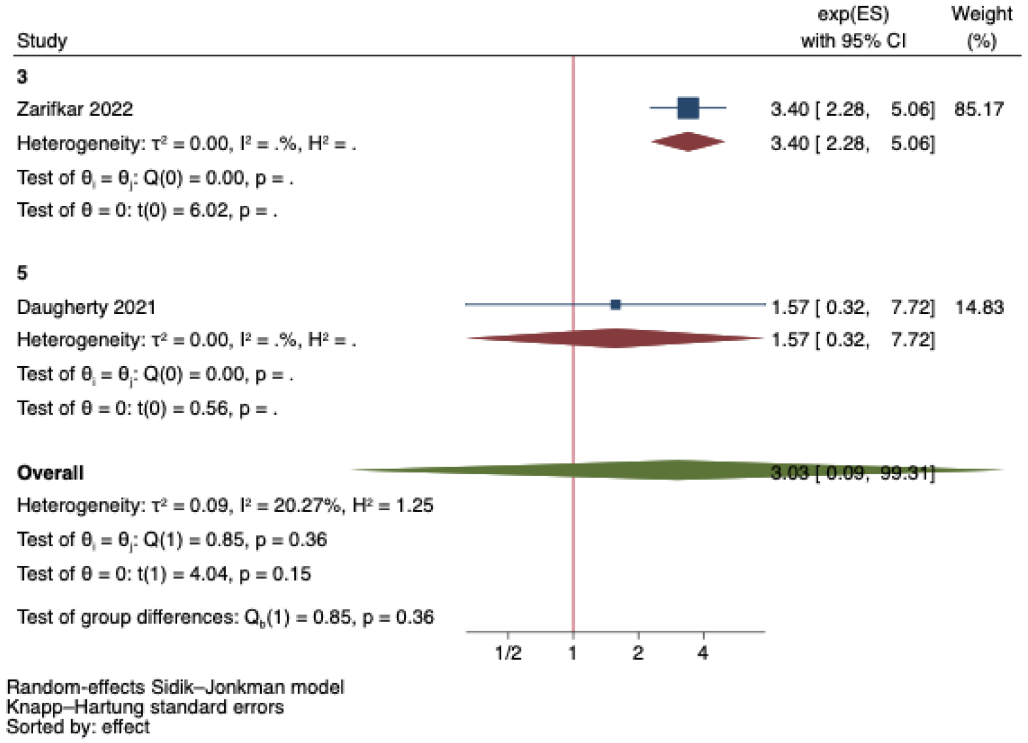
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 4.3. Dementia



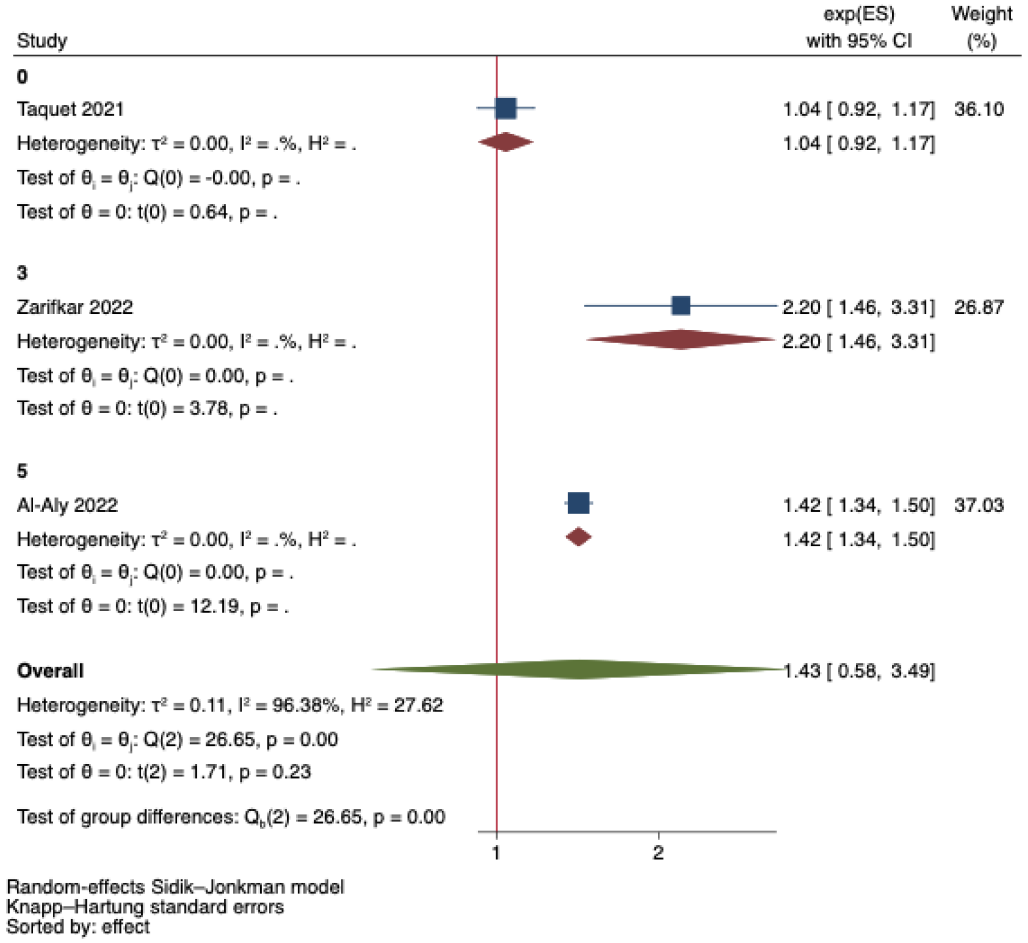
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 4.4 Alzheimer's Disease



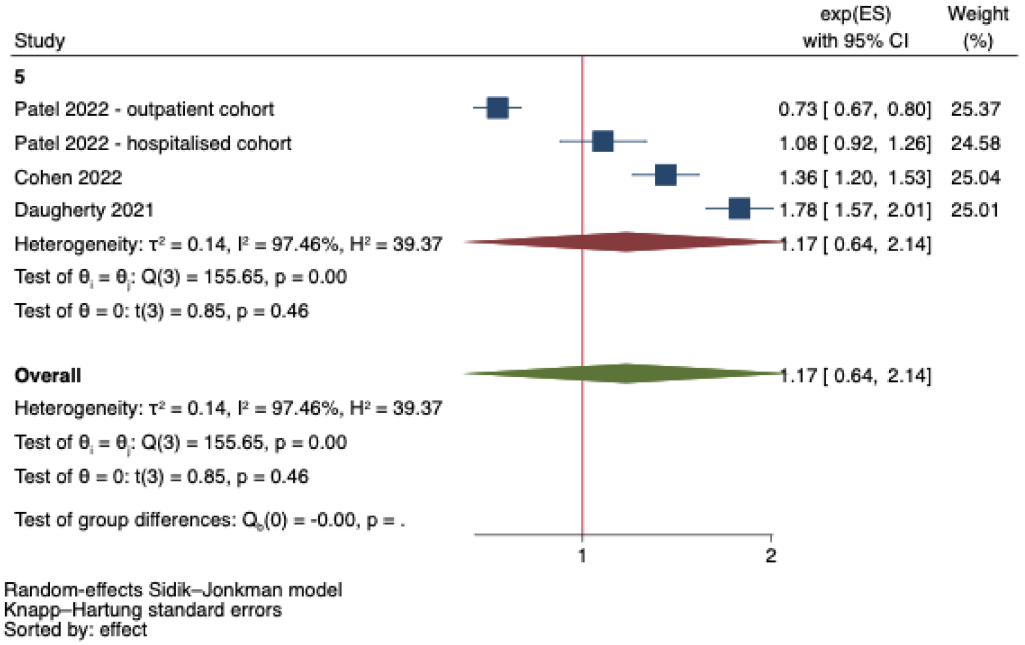
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 4.5 Extrapyramidal and movement disorders



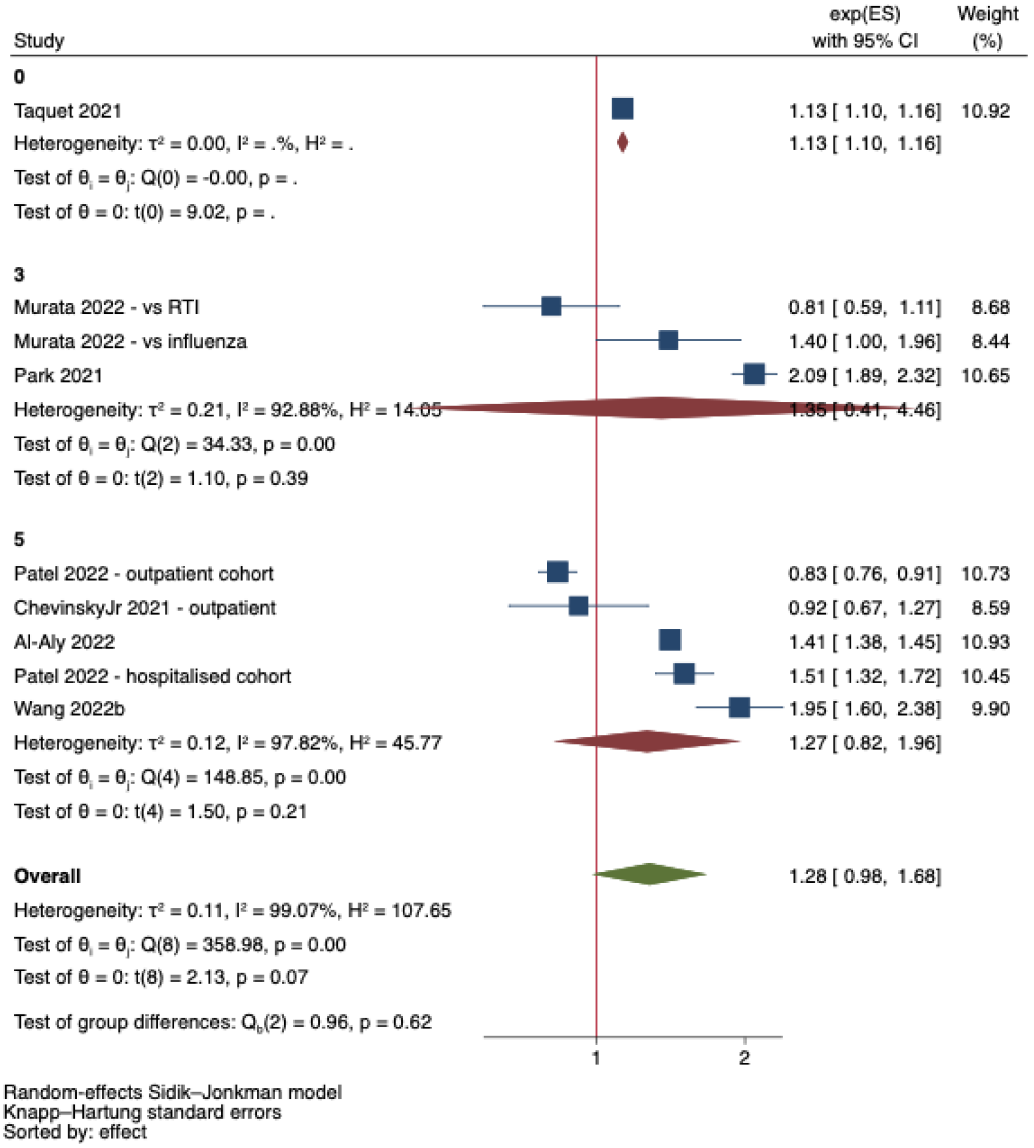
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 4.6 Sleep apnea

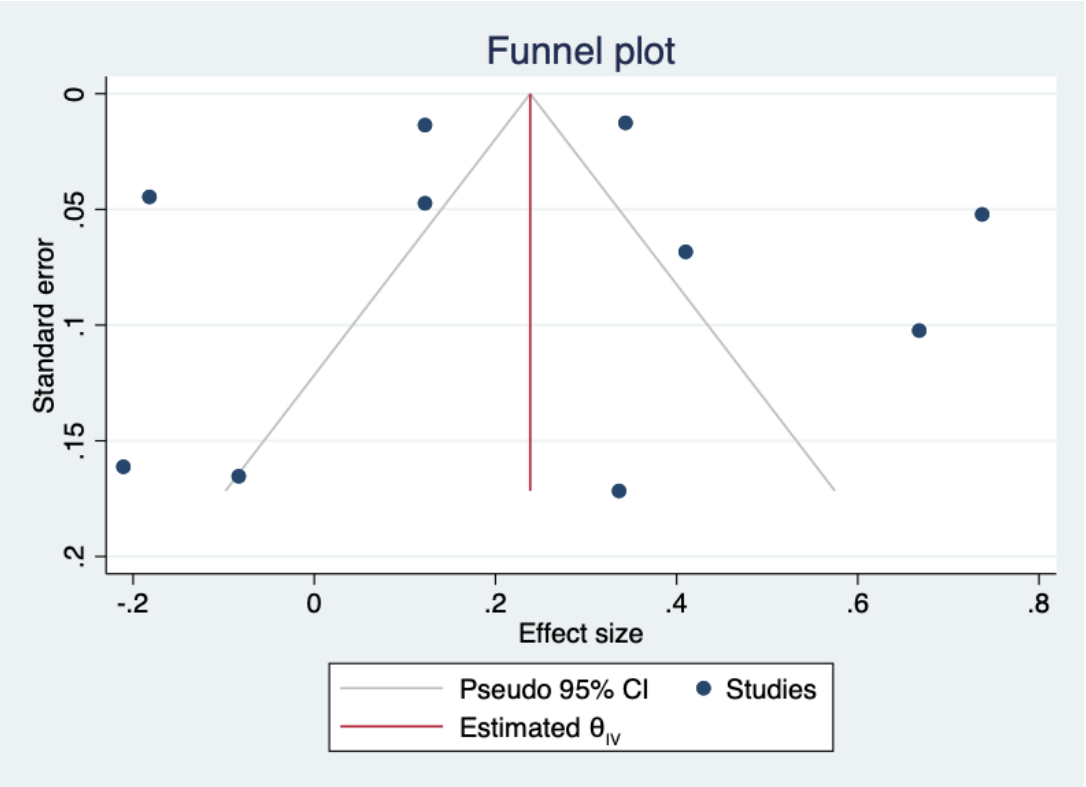


Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 4.7 Other sleep disorders



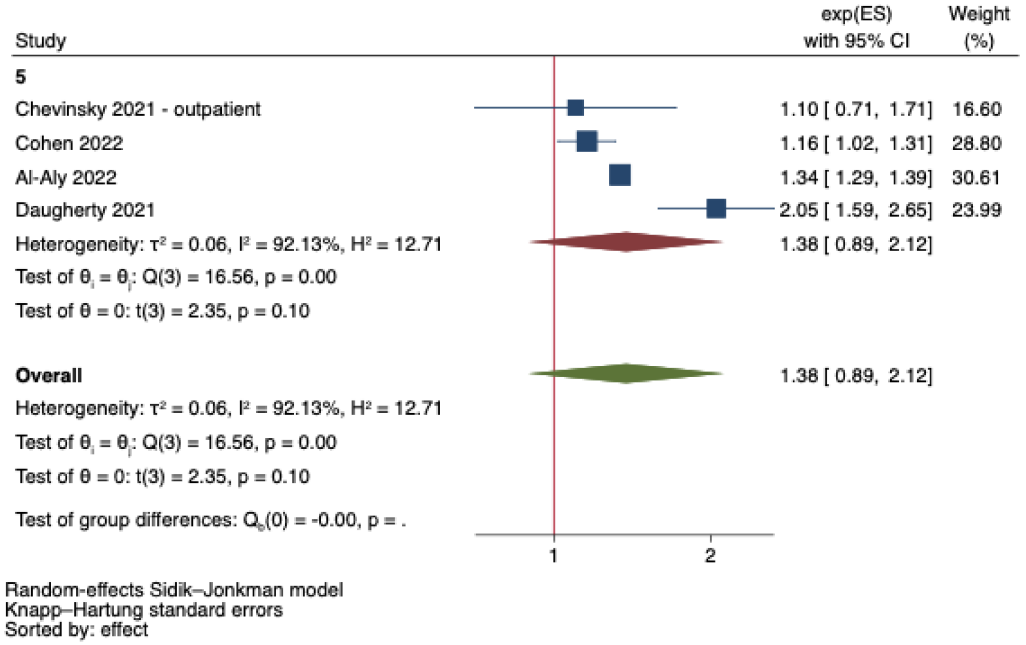
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.



Publication bias (Egger)

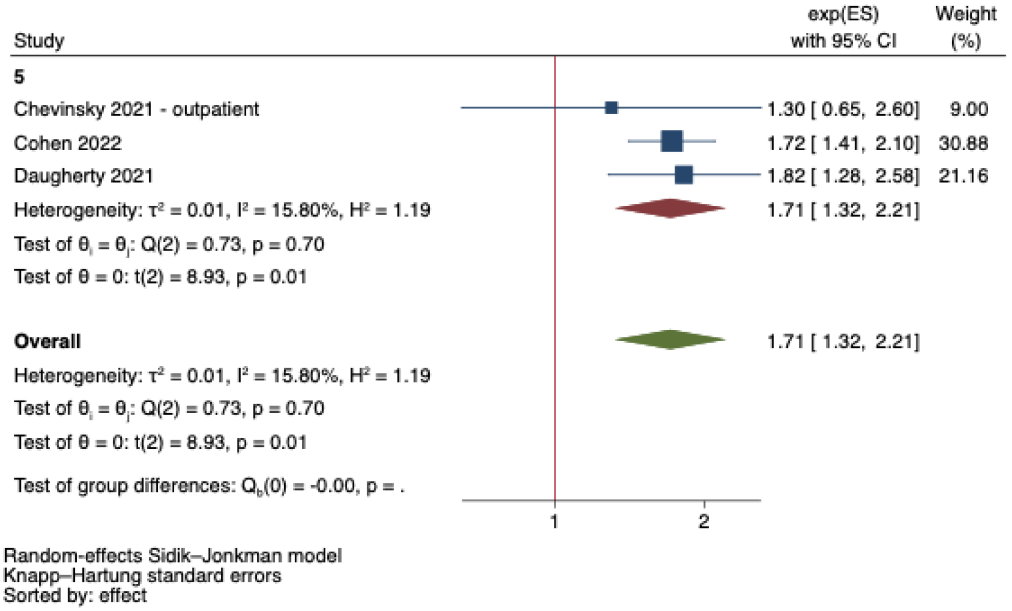
```
H0: beta1 = 0; no small-study effects
            beta1 =     -1.06
       SE of beta1 =     1.888
                 z =     -0.56
        Prob > |z| =    0.5750
```

Analysis 4.8 Peripheral Neuropathy



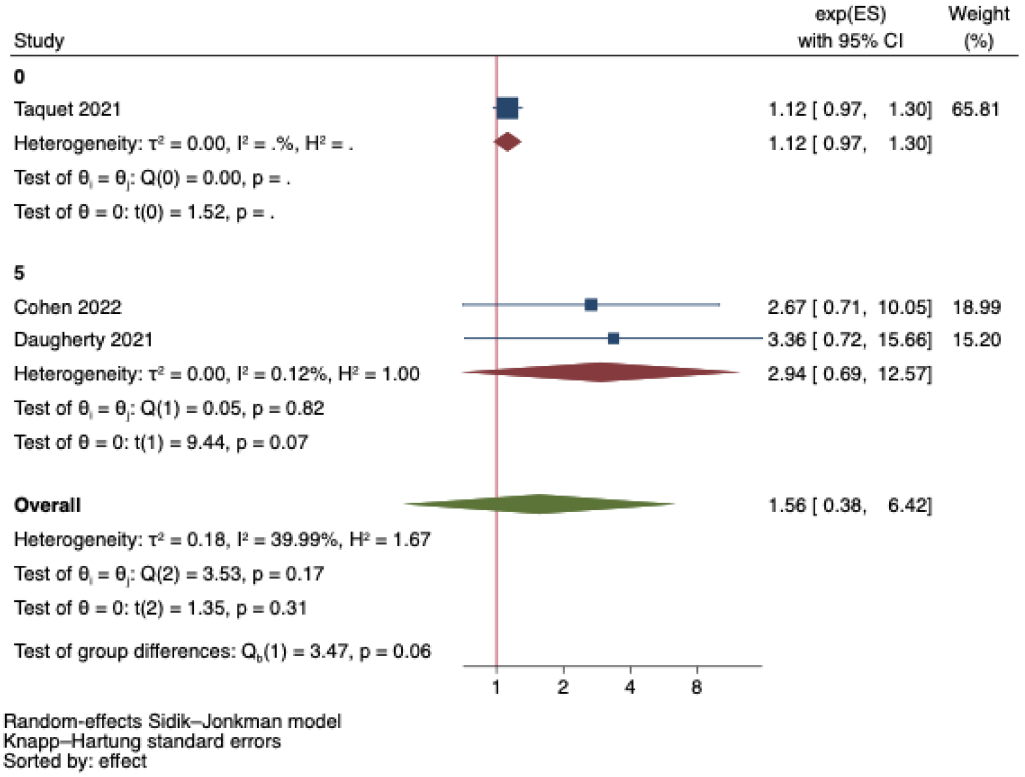
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 4.9 Epilepsy or seizures



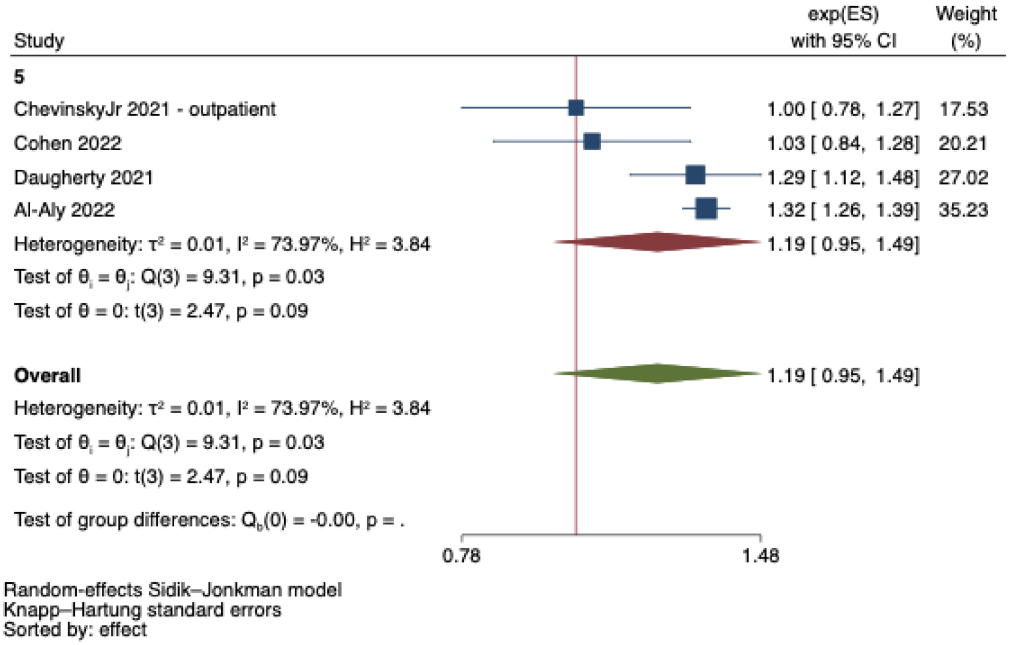
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 4.10 Guillain Barré syndrome



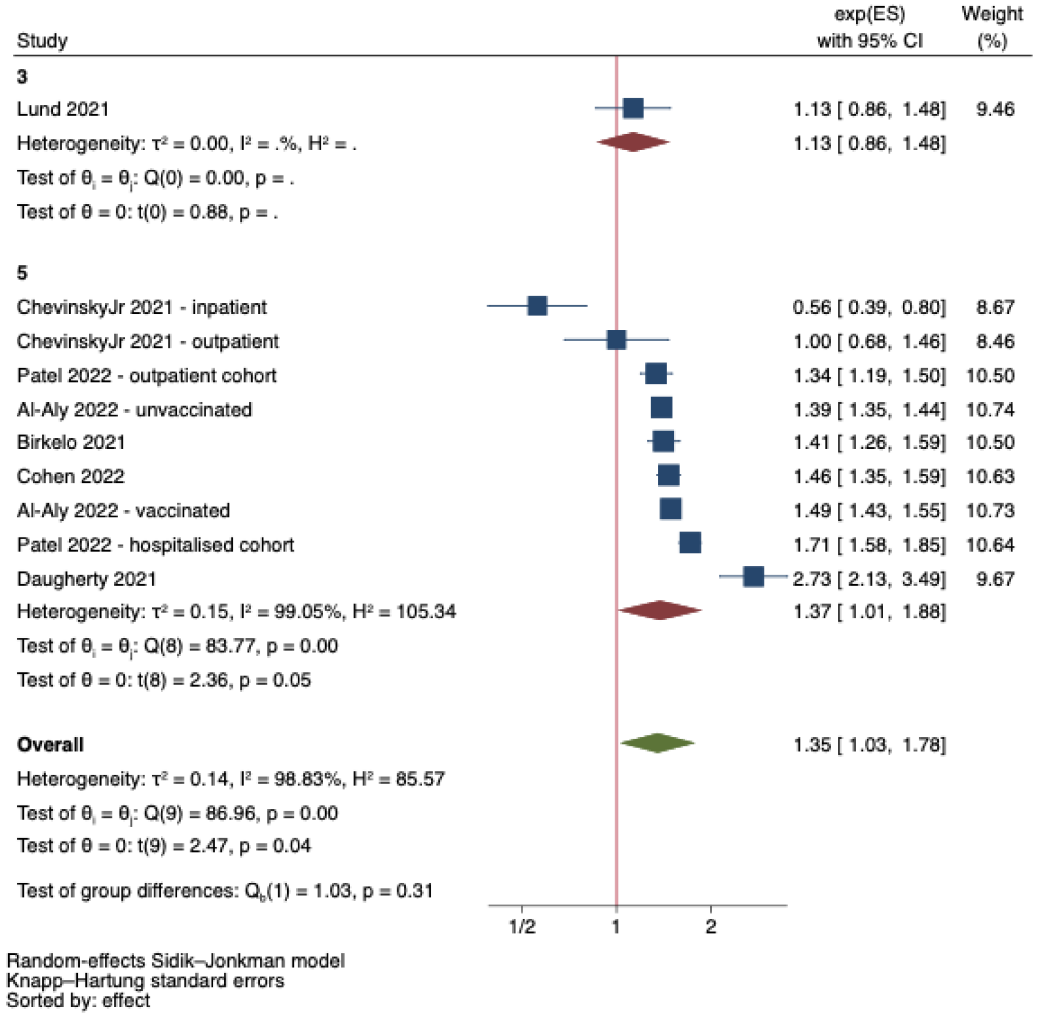
Meta-regression and testing for publication are not possible (<10 studies per variable). We used the most adjusted estimate in the manuscript.

Analysis 4.11 Headaches and Migraines

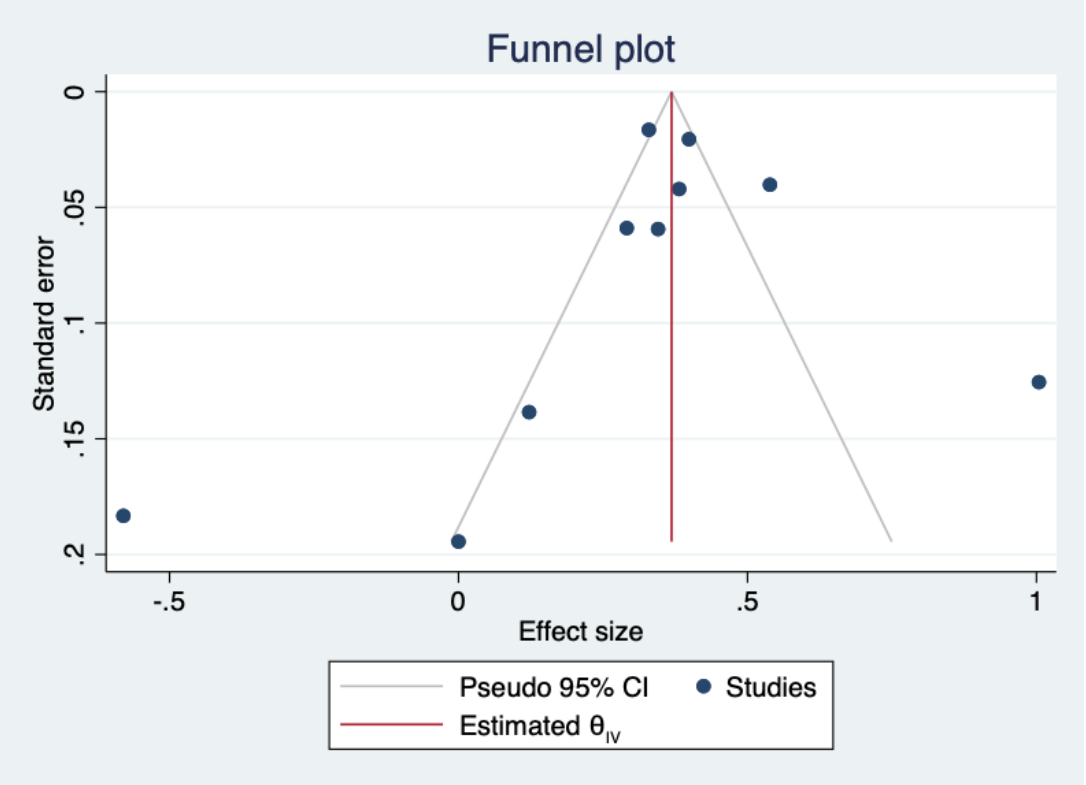


Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 5.1 Acute kidney injury



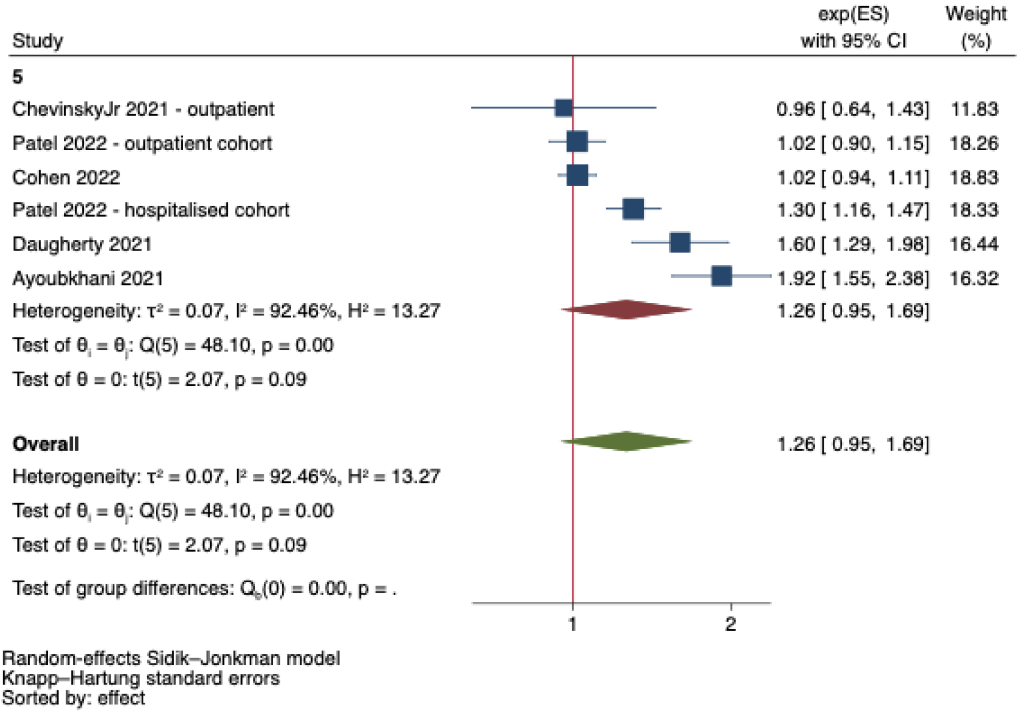
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.



Publication bias (Egger)

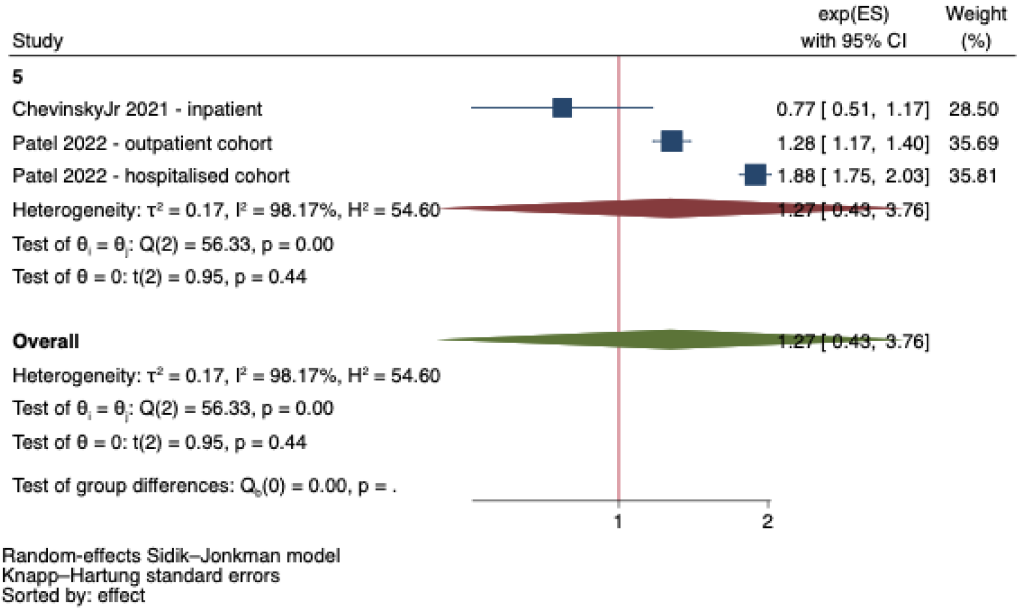
```
H0: beta1 = 0; no small-study effects
            beta1 =     -2.87
       SE of beta1 =     1.864
                 z =     -1.54
        Prob > |z| =    0.1240
```

Analysis 5.2 Chronic kidney disease



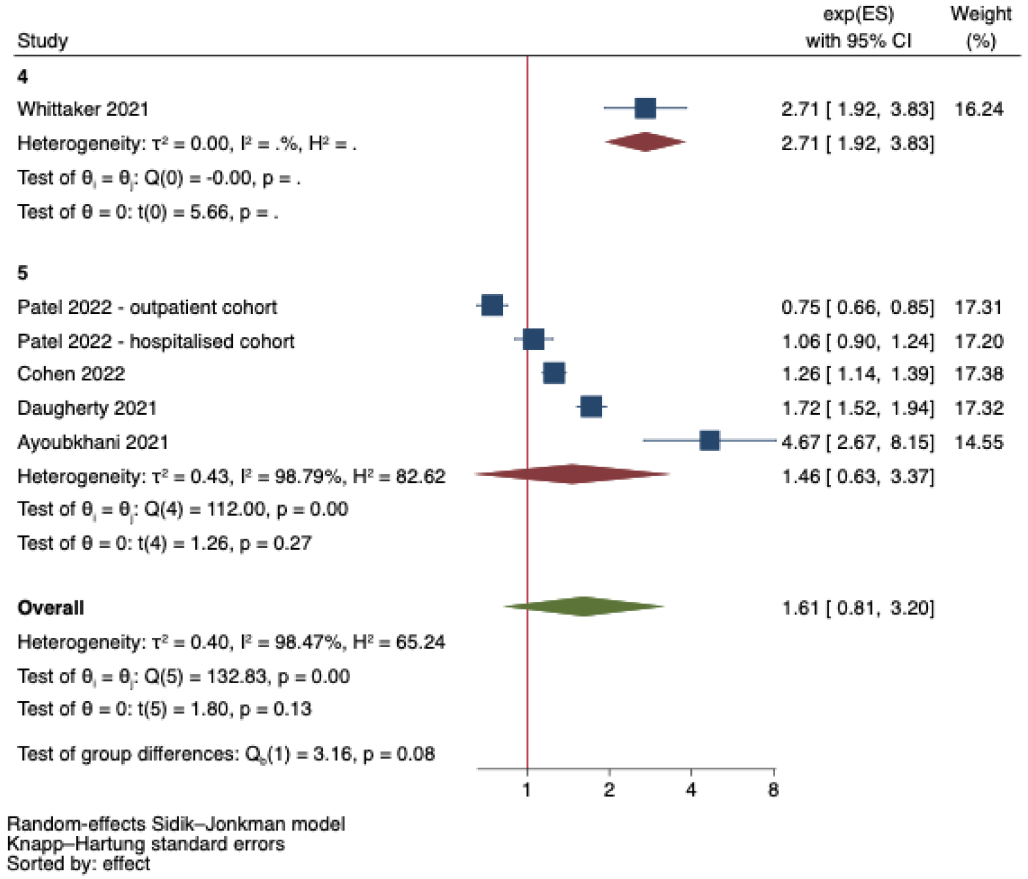
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 5.3 Fluid and electrolyte disorders



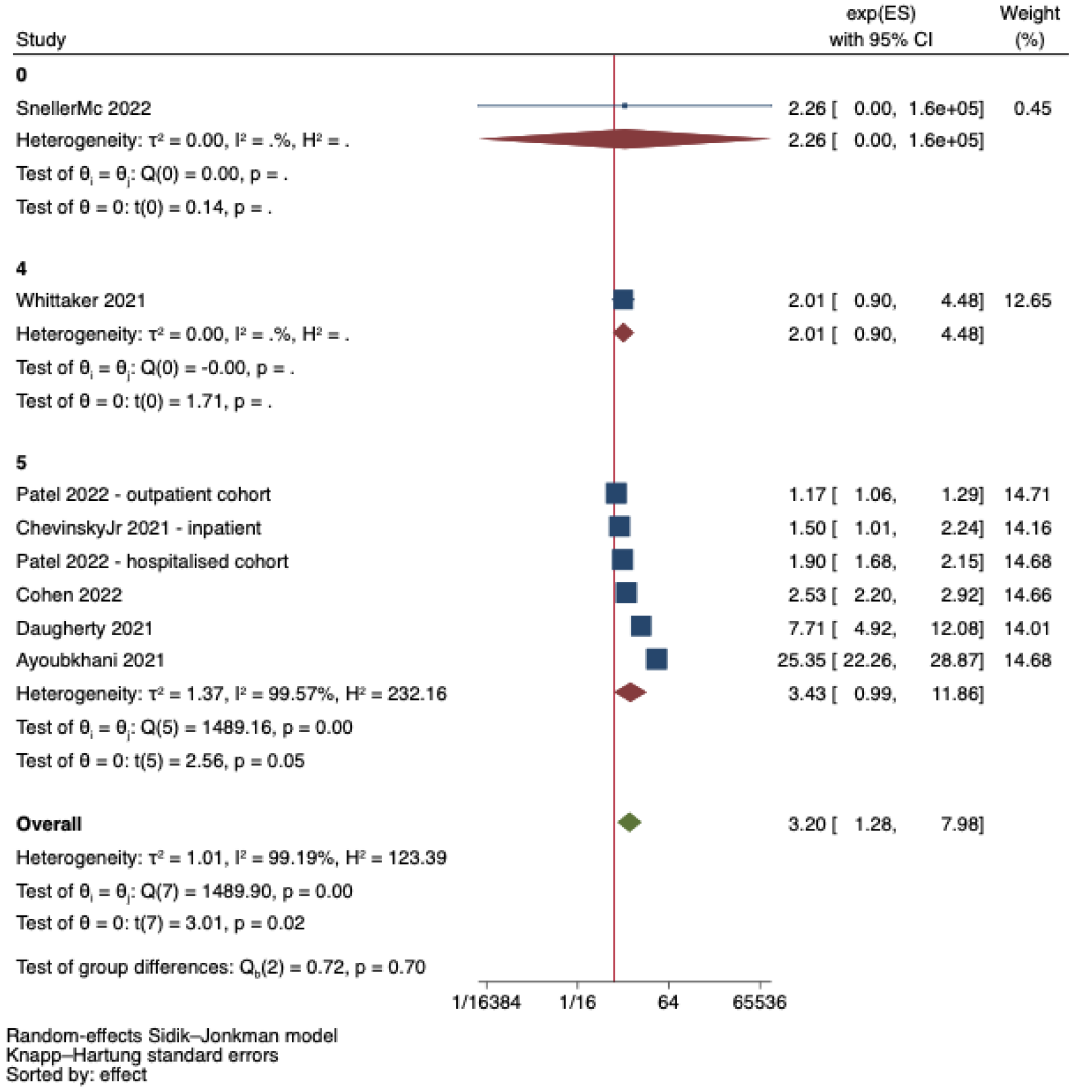
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 6.1 Liver disorders



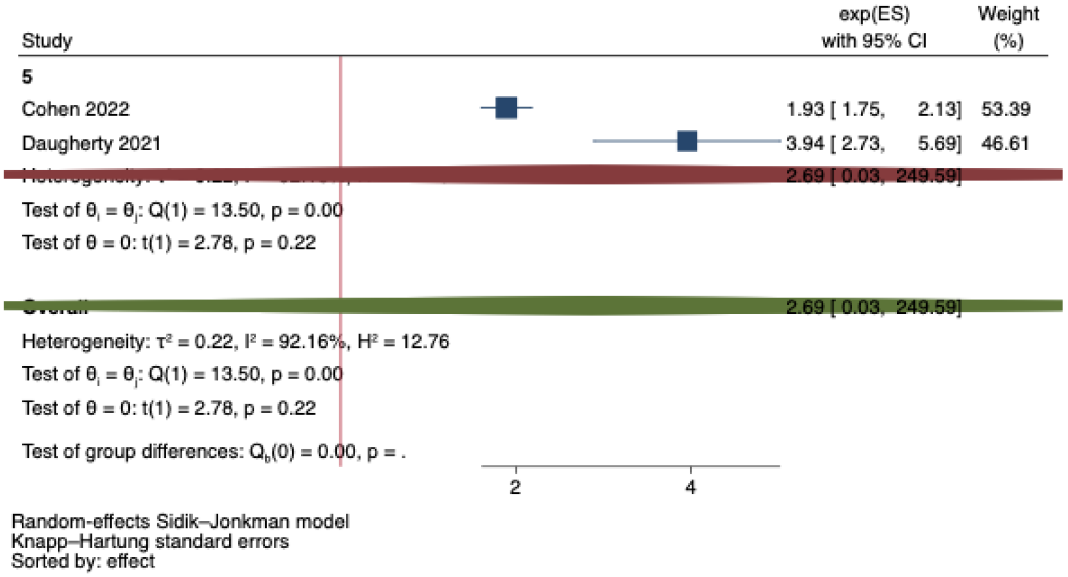
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 7.1 Lung disorders (general)



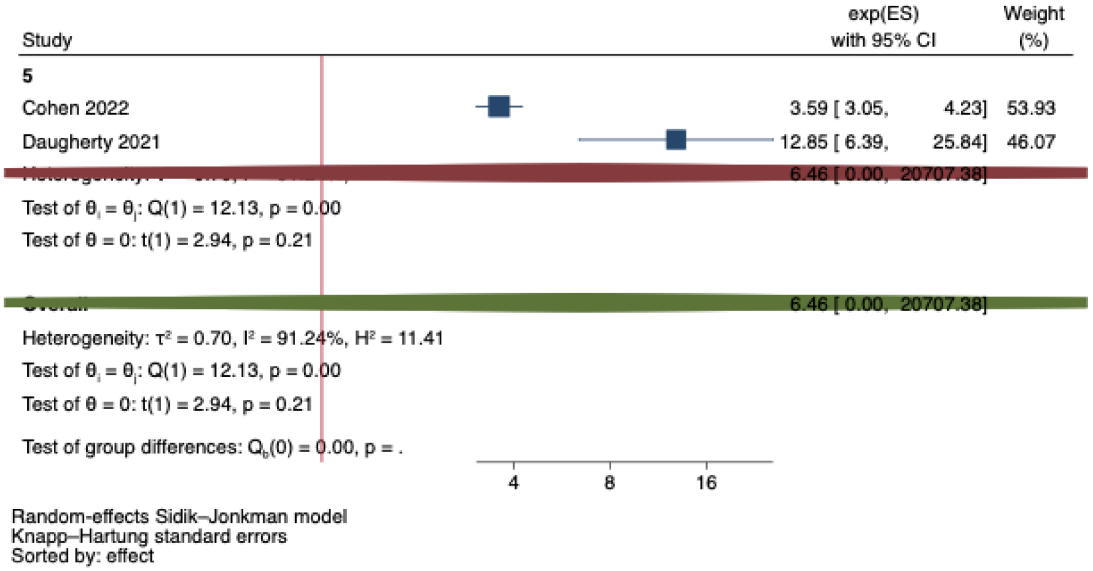
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 7.2 Acute respiratory disorder



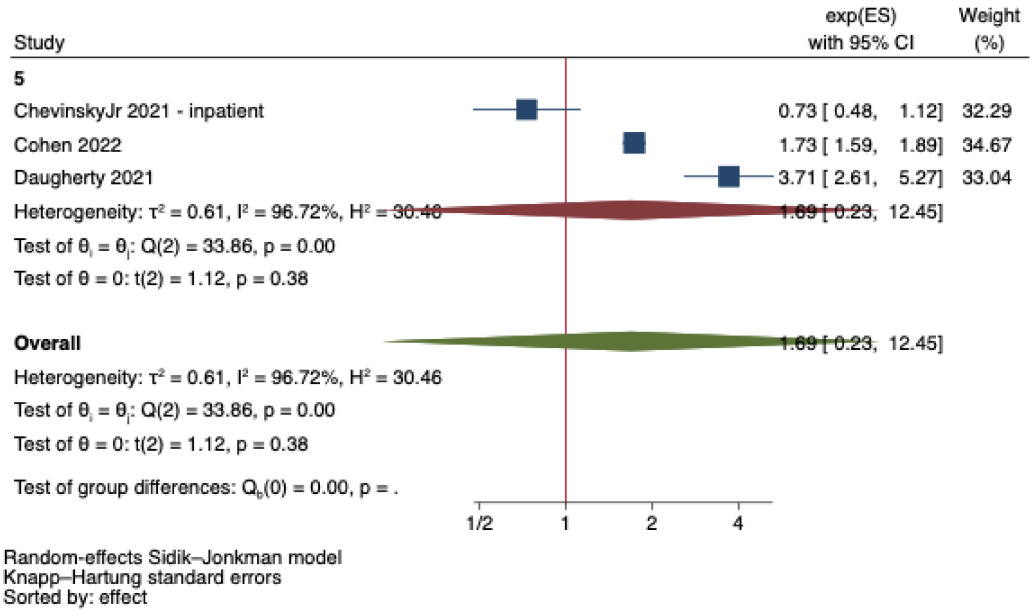
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 7.3 Chronic respiratory failure



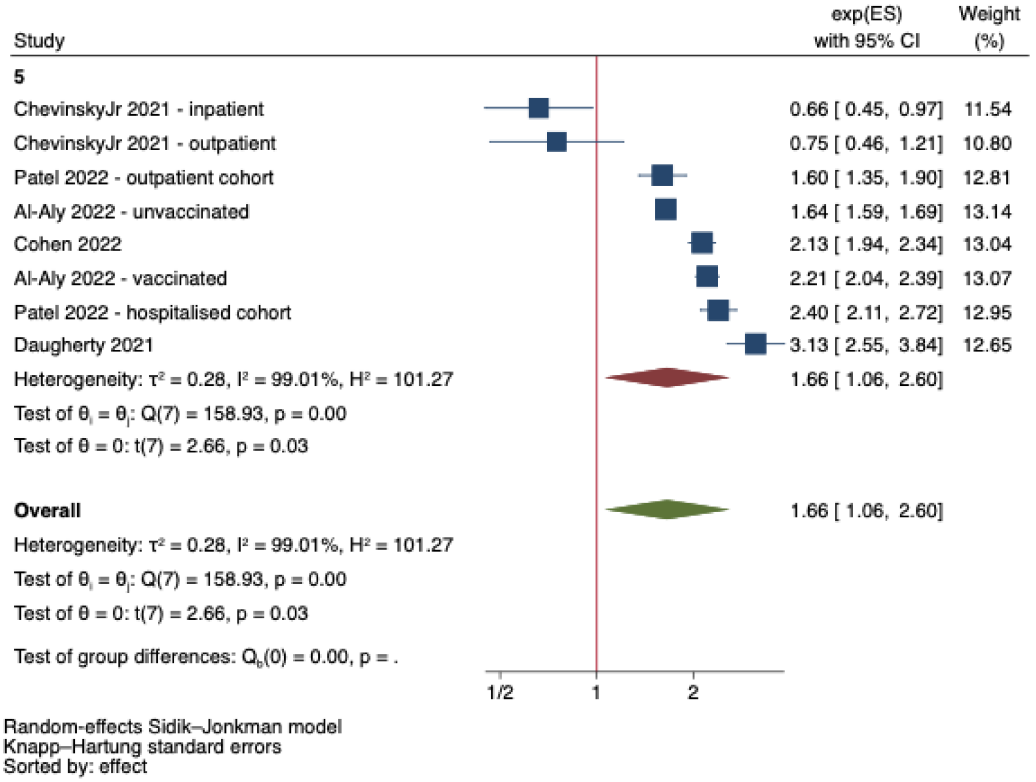
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 7.4 Respiratory failure (unspecified)



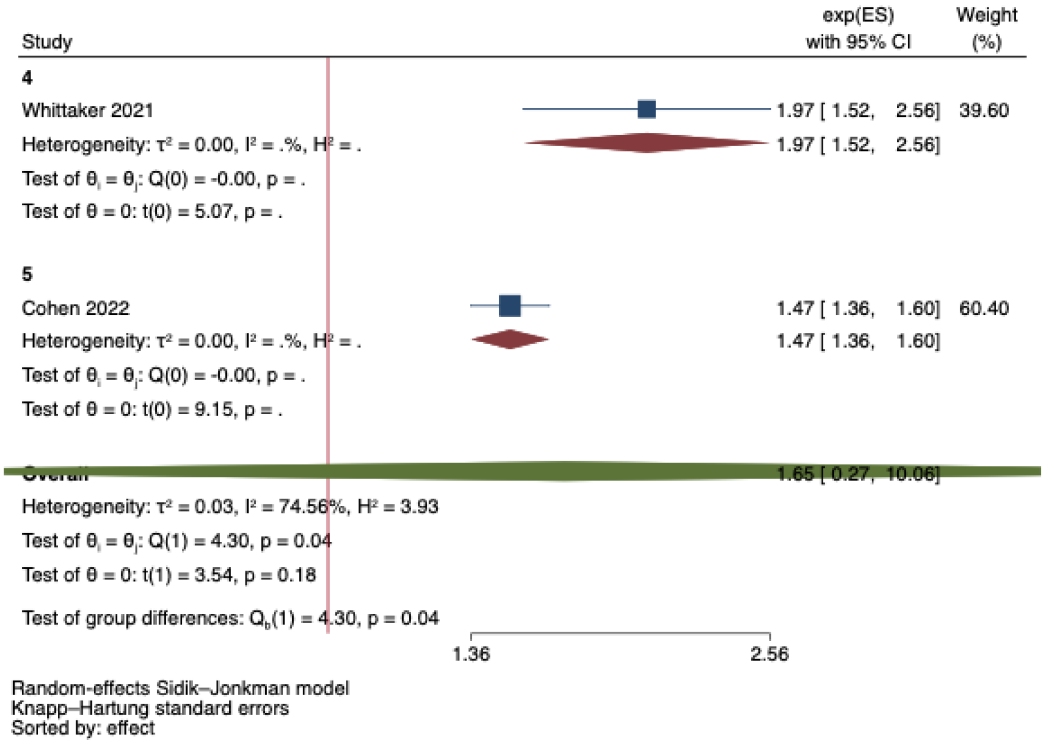
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 8.1 Coagulation disorders



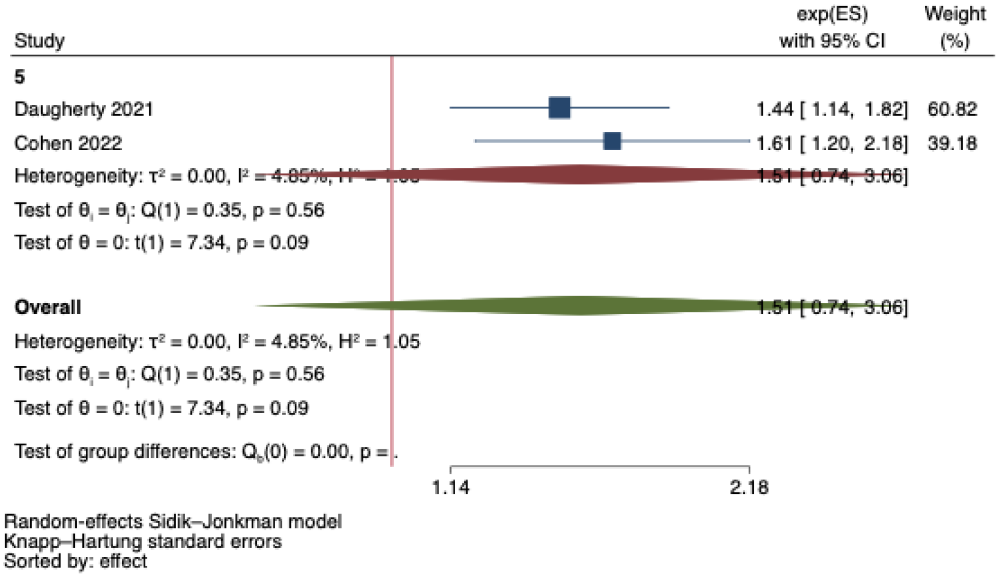
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 8.2 Anemia



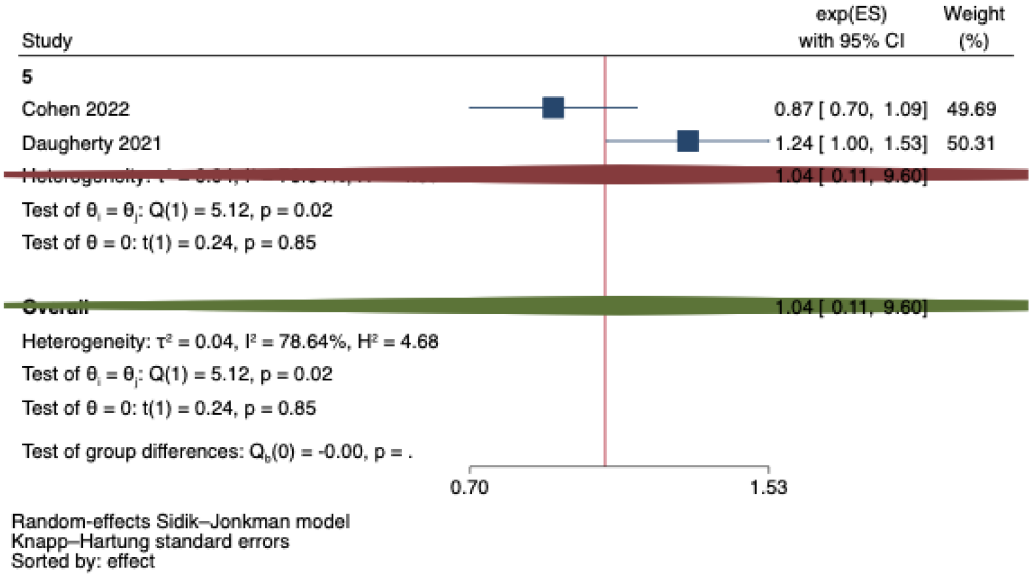
Meta-regression and testing for publication are not possible (<10 studies per variable). As there is little variation in effect estimates of the most adjusted group with the overall estimate, we used the overall estimate in the main manuscript.

Analysis 8.3 Urticaria



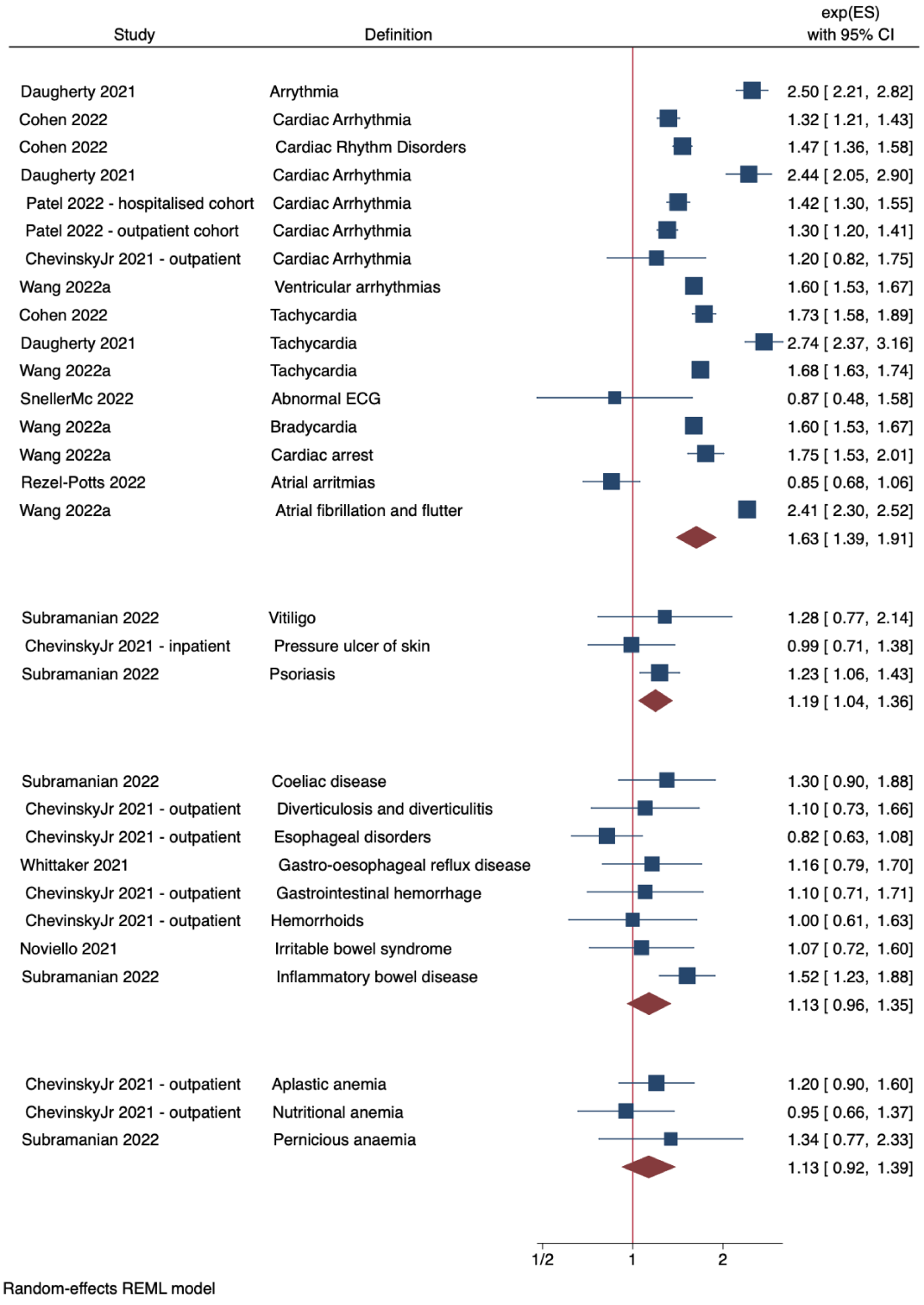
Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

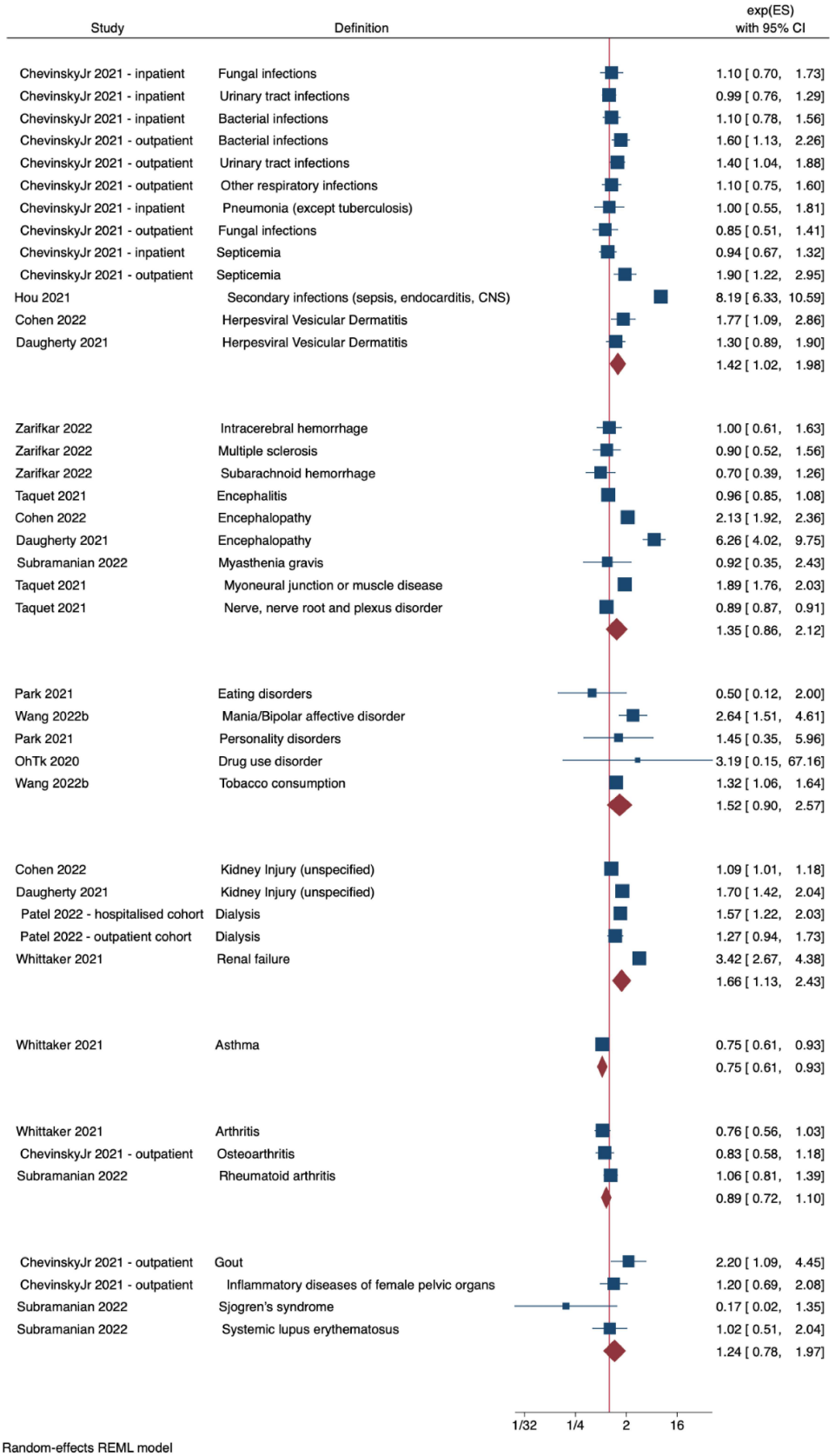
Analysis 8.4 Atopic dermatitis

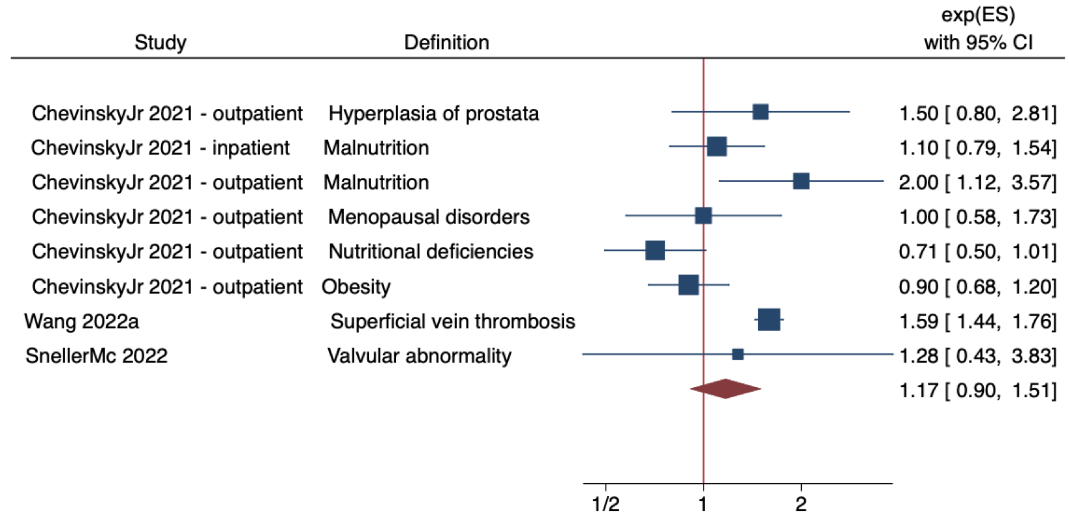


Meta-regression and testing for publication are not possible (<10 studies per variable). All studies were fully adjusted.

Analysis 9. Other diagnosis (no meta-analysis)




Study
Definition
exp(ES) with 95% CI
ChevinskyJr 2021 - inpatient Fungal infections 1.10 [0.70, 1.73]
ChevinskyJr 2021 - inpatient Urinary tract infections 0.99 [0.76, 1.29]
ChevinskyJr 2021 - inpatient Bacterial infections 1.10 [0.78, 1.56]
ChevinskyJr 2021 - outpatient Bacterial infections 1.60 [1.13, 2.26]
ChevinskyJr 2021 - outpatient Urinary tract infections 1.40 [1.04, 1.88]
ChevinskyJr 2021 - outpatient Other respiratory infections 1.10 [0.75, 1.60]
ChevinskyJr 2021 - inpatient Pneumonia (except tuberculosis) 1.00 [0.55, 1.81]
ChevinskyJr 2021 - outpatient Fungal infections 0.85 [0.51, 1.41]
ChevinskyJr 2021 - inpatient Septicemia 0.94 [0.67, 1.32]
ChevinskyJr 2021 - outpatient Septicemia 1.90 [1.22, 2.95]
Hou 2021 Secondary infections (sepsis, endocarditis, CNS) 8.19 [6.33, 10.59]
Cohen 2022 Herpesviral Vesicular Dermatitis 1.77 [1.09, 2.86]
Daugherty 2021 Herpesviral Vesicular Dermatitis 1.30 [0.89, 1.90]
1.42 [1.02, 1.98]
Zarifkar 2022 Intracerebral hemorrhage 1.00 [0.61, 1.63]
Zarifkar 2022 Multiple sclerosis 0.90 [0.52, 1.56]
Zarifkar 2022 Subarachnoid hemorrhage 0.70 [0.39, 1.26]
Taquet 2021 Encephalitis 0.96 [0.85, 1.08]
Cohen 2022 Encephalopathy 2.13 [1.92, 2.36]
Daugherty 2021 Encephalopathy 6.26 [4.02, 9.75]
Subramanian 2022 Myasthenia gravis 0.92 [0.35, 2.43]
Taquet 2021 Myoneural junction or muscle disease 1.89 [1.76, 2.03]
Taquet 2021 Nerve, nerve root and plexus disorder 0.89 [0.87, 0.91]
1.35 [0.86, 2.12]
Park 2021 Eating disorders 0.50 [0.12, 2.00]
Wang 2022b Mania/Bipolar affective disorder 2.64 [1.51, 4.61]
Park 2021 Personality disorders 1.45 [0.35, 5.96]
OhTk 2020 Drug use disorder 3.19 [0.15, 67.16]
Wang 2022b Tobacco consumption 1.32 [1.06, 1.64]
1.52 [0.90, 2.57]
Cohen 2022 Kidney Injury (unspecified) 1.09 [1.01, 1.18]
Daugherty 2021 Kidney Injury (unspecified) 1.70 [1.42, 2.04]
Patel 2022 - hospitalised cohort Dialysis 1.57 [1.22, 2.03]
Patel 2022 - outpatient cohort Dialysis 1.27 [0.94, 1.73]
Whittaker 2021 Renal failure 3.42 [2.67, 4.38]
1.66 [1.13, 2.43]
Whittaker 2021 Asthma 0.75 [0.61, 0.93]
0.75 [0.61, 0.93]
Whittaker 2021 Arthritis 0.76 [0.56, 1.03]
ChevinskyJr 2021 - outpatient Osteoarthritis 0.83 [0.58, 1.18]
Subramanian 2022 Rheumatoid arthritis 1.06 [0.81, 1.39]
0.89 [0.72, 1.10]
ChevinskyJr 2021 - outpatient Gout 2.20 [1.09, 4.45]
ChevinskyJr 2021 - outpatient Inflammatory diseases of female pelvic organs 1.20 [0.69, 2.08]
Subramanian 2022 Sjogren's syndrome 0.17 [0.02, 1.35]
Subramanian 2022 Systemic lupus erythematosus 1.02 [0.51, 2.04]
1.24 [0.78, 1.97]
1/32
1/4
2
16
Random-effects REML model



Random-effects REML model

Supplementary table. Estimated rates of incident diagnosis in covid and control groups.

Group	Outcome	Median rate in the control group	Estimated rate in the covid group
Metabolic	Diabetes	0.54%	0.85% (0.69% to 1.04%)
Metabolic	Thyroid disease	0.00%	0.00% (0.00% to 0.01%)
Psychiatric	Any psychiatric disorder	7.61%	10.58% (9.59% to 11.57%)
Psychiatric	Mood disorders	3.70%	8.11% (7.11% to 9.25%)
Psychiatric	Depressive disorders	1.00%	1.50% (1.12% to 2.01%)
Psychiatric	Anxiety disorder	1.17%	1.41% (1.16% to 1.70%)
Psychiatric	Panic disorder	0.22%	0.24% (0.04% to 1.33%)
Psychiatric	Post-traumatic stress disorder	0.75%	1.00% (0.42% to 2.36%)
Psychiatric	Psychosis	0.19%	0.42% (0.32% to 0.55%)
Psychiatric	Any substance use disorders	0.26%	0.33% (0.17% to 0.63%)
Psychiatric	Alcohol use disorder	N/A	N/A
Cardiovascular	All cardiovascular	0.54%	1.18% (0.40% to 3.52%)
Cardiovascular	Arterial Hypertension	1.84%	2.14% (1.69% to 2.71%)
Cardiovascular	Pulmonary hypertension	0.47%	0.92% (0.00% to 100.00%)
Cardiovascular	Heart failure	0.83%	0.99% (0.66% to 1.49%)
Cardiovascular	Postural Tachycardia Syndrome	0.50%	0.94% (0.03% to 30.65%)
Cardiovascular	Myocarditis	0.01%	0.02% (0.00% to 0.90%)
Cardiovascular	Pericarditis	0.02%	0.03% (0.02% to 0.03%)
Cardiovascular	Myocardial infarction	0.50%	0.64% (0.45% to 0.90%)
Cardiovascular	Cardiogenic shock	0.03%	0.03% (0.00% to 6.85%)
Cardiovascular	Cardiomiopathy	0.04%	0.15% (0.10% to 0.21%)
Cardiovascular	Peripheral artery disease	0.50%	0.48% (0.26% to 0.91%)
Cardiovascular	Deep vein thrombosis	0.19%	0.59% (0.16% to 2.20%)
Cardiovascular	Pulmonary embolism	0.24%	0.57% (0.31% to 1.03%)
Cardiovascular	Hemorrhagic stroke	0.46%	0.80% (0.55% to 1.15%)
Cardiovascular	Stroke (general)	0.60%	14.87% (14.51% to 15.23%)
Neurological	Sensory disorders	11.90%	3.21% (2.04% to 5.06%)
Neurological	Cognitive impairment	1.65%	1.30% (0.77% to 2.20%)
Neurological	Dementia	0.98%	0.03% (0.01% to 0.15%)
Neurological	Alzheimer's disease	0.02%	0.04% (0.02% to 0.09%)

Neurological	Extrapyramidal and other movement disorders	0.03%	1.49% (0.81% to 2.72%)
Neurological	Sleep apnea	1.27%	3.20% (2.45% to 4.20%)
Neurological	Other sleep disorders	2.50%	0.77% (0.50% to 1.18%)
Neurological	Peripheral neuropathy	0.56%	0.31% (0.24% to 0.40%)
Neurological	Epilepsy or seizure	0.18%	0.01% (0.00% to 0.04%)
Neurological	Guillain Barré syndrome	0.00%	0.24% (0.19% to 0.30%)
Neurological	Headaches and migraine	0.20%	5.79% (4.42% to 7.64%)
Renal	Acute kidney injury	4.29%	1.70% (1.28% to 2.28%)
Renal	Chronic kidney injury	1.35%	5.91% (2.00% to 17.51%)
Renal	Fluid and electrolyte disorders	4.66%	1.19% (0.60% to 2.37%)
Hepatic	Liver disease	0.74%	2.63% (1.05% to 6.56%)
Pulmonary	Lung disorders	0.82%	2.00% (0.02% to 100.00%)
Pulmonary	Acute respiratory failure	0.74%	1.42% (0.00% to 100.00%)
Pulmonary	Chronic respiratory failure	0.22%	1.75% (0.24% to 12.88%)
Pulmonary	Respiratory failure (unspecified)	1.03%	1.37% (0.87% to 2.14%)
Hematic	Coagulopathy	0.82%	2.18% (0.36% to 13.31%)
Hematic	Anemia	1.32%	0.12% (0.06% to 0.25%)
Dermal	Urticaria	0.08%	0.21% (0.02% to 1.96%)
Dermal	Atopic dermatitis	0.20%	0.85% (0.69% to 1.04%)

N/A Not available