Supplementary appendix

Supplement to: Ho ISS, Azcoaga-Lorenzo A, Akbari A, et al. Variation in the estimated prevalence of multimorbidty: systematic review and meta-analysis of 193 studies.

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Table S1: Search strategy

Database	Search strategy
Ovid Interface PsycINFO Embase Global Health Ovid MEDLINE	1. (multimorbidit$ or multi-morbidit$ or comorbidit$ or co-morbidit$ or polymorbidit$ or poly-morbidit$ or multicondition$ or multicondition$ or "multiple chronic condition$" or "morbidity burden" or ((multiple or coexisting or co-existing or concurrent or con-current or comorbid or co-morbid) adj2 (disease$ or illness$ or condition$ or diagnos$ or morbid$))).m_titl. 2. (measure$ or index or indices or instrument$ or scale$ or "disease count$").mp. 3. 1 and 2 4. Limit 3 to human
EBSCO Interface CINAHL Plus	1. MM (multimorbidit* or multi-morbidit* or comorbidit* or co-morbidit* or polymorbidit* or poly-morbidit* or multicondition* or multicondition* or "multiple chronic condition*" or "morbidity burden" or ((multiple or coexisting or co-existing or concurrent or con-current or comorbid or co-morbid) N2 (disease* or illness* or condition* or diagnos* or morbid*))) 2. AB (measure* or index or indices or instrument* or scale*) 3. 1 AND 2 Limiters – Full Text; Human; Language: English
Scopus	TITLE (multimorbidit* or multi-morbidit* or comorbidit* or co-morbidit* or polymorbidit* or poly-morbidit* or multicondition* or multicondition* or "multiple chronic condition*" or "morbidity burden" or ((multiple or coexisting or co-existing or concurrent or con-current or morbid or co-morbid) W/2 (disease* or illness* or condition* or diagnos?s or morbid*))) AND TITLE (measure* or index or indices or instrument* or scale* or "disease counts")
Web of Science	(TI=(measure* or index or indices or instrument* or scale*))AND (TI=(multimorbidit* or multi-morbidit* or comorbidit* or co-morbidit* or polymorbidit* or poly-morbidit* or multicondition* or multicondition* or 'multiple chronic condition*' or 'morbidity burden' or ((multiple or coexisting or co-existing or concurrent or con-current or comorbid or co-morbid) NEAR/2 (disease* or illness* or condition* or diagnos* or morbid*)))) AND LANGUAGE: (English)
Cochrane library	(multimorbidity or multi-morbidity or comorbidity or co-morbidity or polymorbidity or poly-morbidity or multicondition or multicondition or 'multiple chronic conditions' or 'morbidity burden' or ((multiple or coexisting or co-existing or concurrent or con-current or comorbid or co-morbid) NEAR/2 (disease or illness or condition or diagnosis or morbid))) AND (measure or index or indices or instrument or scale or "disease count*"):ti
ProQuest Dissertations & Theses Global	ti((multimorbidit* OR multi-morbidit* OR comorbidit* OR co-morbidit* OR polymorbidit* OR poly-morbidit* OR multicondition* OR multicondition* OR 'multiple chronic condition*' OR 'morbidity burden' OR ((multiple OR coexisting OR co-existing OR concurrent OR con-current OR morbid OR co-morbid) NEAR/2 (disease* OR illness* OR condition* OR diagnos?s OR morbid*)))) AND noft((measure* OR index OR indices OR instrument* OR scale*)) Limited by: Manuscript type: Doctoral dissertations, Master's theses Language: English

Table S2: Summary of the characteristics of outlying studies

Name of variable	Outlying studies (n=24)	All studies (n=217)
Prevalence of multimorbidity (%)	Range: 7.3 to 89.1 Pooled prevalence with the REML estimator: 31.0 (21.6-42.2)	Range: 2.7-95.6 Pooled prevalence with the REML estimator: 41.1 (37.7-44.6)
Mean age of study population (year)	Range of mean age: 39.6 to 82.2 Median of mean age: 56.6 (Q1, Q3: 52.3, 66.4)	Range of mean age: 32.2 to 83.8 Median of mean age: 62.4 (Q1,Q3: 50.2,72.0)
No of conditions (count)	Range: 7 to 259 Median: 34 (Q1, Q3: 19.5, 54.5)	Range: 3 to 259 Median: 14.0 (Q1, Q3: 9, 21)
Country income (count, %)		
High income	21 (87.5%)	166 (76.5%)
Low- or Middle-income	3 (11.5%)	51 (23.5%)
Continent (count, %)		
Europe	6 (25.0%)	70 (32.3%)
North America	7 (29.2%)	54 (24.9%)
Asia	7 (29.2%)	51 (23.5%)
Australasia	3 (12.5%)	14 (6.5%)
Multiple continents	1 (4.2%)	12 (5.5%)
South America		12 (5.5%)
Africa		4 (1.8%)
Study population (count, %)		
Only older people	2 (8.3%)	65 (30.0%)
Middle-aged and older	1 (4.2%)	47 (21.7%)
All adults	15 (62.5%)	99 (45.6%)
Only children	1 (4.2%)	1 (0.5%)
All age population	5 (20.8%)	5 (2.3%)
Setting (count, %)		
Community	12 (50.0%)	159 (73.3%)
Primary care	7 (29.2%)	39 (18.0%)
Hospital	4 (16.7%)	18 (8.3%)
Care home	1 (4.2%)	1 (0.5%)
Source (count, %)		
Self-report	8 (33.3%)	158 (72.8%)
Database	16 (66.6%)	59 (27.2%)
Risk of bias assessment (count, %)		
Low	4 (16.7%)	13 (6.0%)
Moderate	19 (79.2%)	181 (83.4%)
High	1 (4.2%)	23 (10.6%)

IQR: Interquartile range. SD: Standard deviation. The percentages were rounded so they do not add up to 100%.

Table S3: Characteristics of 24 outlying studies

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias	Rationale for exclusion
[1] Stanley et al (2018)	New Zealand	Australasia	High	Hospitals	All adults	Not reported	3489747	Medical records and administrative database	61	275706	0.08	Moderate	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis) and the studentized residual of this study is more than 2 standard deviations away from its expected value.
[2] Lenzi et al (2016)	Italy	Europe	High	Hospitals	All adults	66.4	3759836	Medical records and administrative database	26	574208	0.15	Moderate	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis)
[3] Hu et al (2019)	Taiwan	Asia	High	Community	All adults	Not reported	1429527	Medical records and administrative database	20	939485	0.66	Low	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis)
[4] Gawron et al (2020)	USA	North America	High	Hospitals	All adults but not older people	Not reported	741612	Medical records and administrative database	Not reported	53824	0.07	Moderate	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis) and the studentized residual of this study is more than 2 standard deviations away from its expected value.
[5] Low et al (2019)	Singapore	Asia	High	Community	All adults	39.6	1181024	Self-report	48	309428	0.26	Low	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis)
[6] Wang et al (2014)	China	Asia	Low or middle	Community	Whole population	Not reported	162464	Self-report	40	17987	0.11	Low	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis)
[7] Gaulin et al (2019)	Canada	North America	High	Hospitals	All adults	51.2	1316832	Medical records and administrative database	34	416282	0.32	Moderate	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis)

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias	Rationale for exclusion
[8] Violan et al (2014)	Spain	Europe	High	Primary care	All adults	47.4	1356761	Medical records and administrative database	146	645818	0.48	Moderate	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis)
[9] Nicholson et al (2019)	Canada	North America	High	Primary care	All adults	52.3	367743	Medical records and administrative database	20	195838	0.53	High	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis)
[10] Bao et al (2019)	China	Asia	Low or middle	Community	Middle aged and older	61.36	18137	Self-report	19	3773	0.21	Moderate	Contributing to high levels of heterogeneity of effect sizes (Leave-one-out analysis)
[11] Fortin et al (2005)	Canada	North America	High	Primary care	All adults	56.55	980	Medical records and administrative database	14	873	0.89	Moderate	The studentized residual of this study is more than 2 standard deviations away from its expected value.
[12] Prazeres et al (2015)	Portugal	Europe	High	Primary care	All adults	56.3	1993	Medical records and administrative database	147	1449	0.73	Moderate	Its Mahalanobis distance exceeds the chi-squared critical value at a 0.01 significance level (multivariate outlier detection)
[13] Lawson et al (2013)	UK	Europe	High	Community	All adults	72.7	7054	Medical records and administrative database	40	1243	0.18	Moderate	Irregular patterns found in compositional data (in scatter plot and Mahalanobis distance test)- low prevalence in studies with high mean participant age and a larger number of conditions
[14] Sullivan et al (2012)	USA	North America	High	Community	All adults	Not reported	47178	Medical records and administrative database	259	19666	0.42	Moderate	Its Mahalanobis distance exceeds the chi-squared critical value at a 0.01 significance level (multivariate outlier detection)

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias	Rationale for exclusion
[15] Peng et al (2020)	China	Asia	Low or middle	Community	Only older people	71.6	1321	Self-report	15	589	0.45	Moderate	Contributing to high levels of heterogeneity of effect sizes (in leave-one-out analysis)
[16] Excoffier et al (2018)	Switzerland	Europe	High	Primary care	All adults	56.5	2904	Medical records and administrative database	75	1513	0.52	Moderate	Its Mahalanobis distance exceeds the chi-squared critical value at a 0.01 significance level (multivariate outlier detection)
[17] Chung et al (2015)	Hong Kong	Asia	High	Community	All adults	Not reported	25780	Self-report	46	3227	0.13	Moderate	Its Mahalanobis distance exceeds the chi-squared critical value at a 0.01 significance level (multivariate outlier detection)
[18] Ki et al (2017)	South Korea	Asia	High	Community	All adults	57.05	19942	Medical records and administrative database	66	5979	0.30	Moderate	Its Mahalanobis distance exceeds the chi-squared critical value at a 0.01 significance level (multivariate outlier detection)
[19] Bobo et al (2016)	USA	North America	High	Community	Whole population	Not reported	138858	Self-report	19	33682	0.24	Moderate	Infrequent values in compositional categorical data (few studies focused on whole population)
[20] Randall et al (2018)	Australia	Australasia	High	Community	Whole population	Not reported	5437018	Self-report	30	660449	0.12	Moderate	Infrequent values in compositional categorical data (few studies focused on whole population)
[21] Russell et al (2020)	New Zealand	Australasia	High	Community	Only children	Not reported	3838	Self-report	7	374	0.10	Moderate	Infrequent values in compositional categorical data (only one study focused on children population)
[22] Barnett et al (2012)	UK	Europe	High	Primary care	Whole population	Not reported	1751841	Medical records and administrative database	40	406427	0.23	Low	Infrequent values in compositional categorical data (few studies focused on whole population)

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias	Rationale for exclusion
[23] St Sauver et al (2015)	USA	North America	High	Primary care	Whole population	Not reported	106061	Medical records and administrative database	20	34592	0.33	Moderate	Infrequent values in compositional categorical data (few studies focused on whole population)
[24] Vetrano et al (2016)	Denmark, Finland, Iceland, Italy, the Netherlands, Norway, United Kingdom, Czech Republic, France, Sweden and Germany, Canada	Multiple continents	High	Care homes	Only older people	82.2	6903	Medical records and administrative database	13	5098	0.74	Moderate	Infrequent values in compositional categorical data (only one study focused on care home)

MM: Multimorbidity. No of participants: The total number of participants in the denominator for estimating prevalence in a study (which could be a subset in some included studies)

Table S4: Characteristics of 193 included studies

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[25] Aarts et al (2012)	The Netherlands	Europe	High	Primary care	All adults	55.4	1184	Medical records and administrative database	23	420	0.35	Moderate
[26] Aarts et al (2011a)	The Netherlands	Europe	High	Community	Middle aged and older	70	15188	Self-report	Not reported	7729	0.51	Moderate
[27] Aarts et al (2011b)	The Netherlands	Europe	High	Primary care	All adults	55.4	1763	Medical records and administrative database	23	985	0.56	Moderate
[28] Abizanda et al (2014)	Spain	Europe	High	Primary care	Only older people	78.6	842	Medical records and administrative database	14	580	0.69	Moderate
[29] Agborsangaya et al (2012)	Canada	North America	High	Community	All adults	46.6	4003	Self-report	16	919	0.23	Moderate
[30] Agborsangaya et al (2013)	Canada	North America	High	Community	All adults	47.8	4803	Self-report	16	1729	0.36	Moderate
[31] Agborsangaya et al (2014)	Canada	North America	High	Community	All adults	47.7	4752	Self-report	16	1597	0.34	Moderate
[32] Ahrenfeldt et al (2019)	Europe	Europe	High	Community	Middle aged and older	66.25	244258	Self-report	10	90652	0.37	Moderate
[33] Alimohammadian et al (2017)	Iran	Asia	Low or middle	Community	Middle aged and older	Not reported	49946	Self-report	8	10035	0.20	Moderate
[34] Angst et al (2002)	Switzerland	Europe	High	Primary care	All adults	Not reported	591	Medical records and administrative database	10	201	0.34	High

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[35] Appa et al (2014)	USA	North America	High	Community	All adults	60.2	1997	Self-report	16	1417	0.71	Moderate
[36] Adams et al (2017)	USA	North America	High	Community	All adults	Not reported	400000	Self-report	12	191600	0.48	Moderate
[37] Ahmadi et al (2016)	Iran	Asia	Low or middle	Community	Middle aged and older	52.1	49946	Self-report	8	10035	0.20	Moderate
[38] Amaral et al (2018)	Brazil	South America	Low or middle	Community	Only older people	Not reported	264	Self-report	8	175	0.66	Moderate
[39] An et al (2016)	South Korea	Asia	High	Community	Middle aged and older	54.8	10118	Self-report	8	3228	0.32	Moderate
[40] Araujo et al (2018)	Brazil	South America	Low or middle	Community	All adults	Not reported	4001	Self-report	12	1160	0.29	Moderate
[41] Arnold-Reed et al (2018)	Australia	Australasia	High	Primary care	All adults	38.2	4285	Medical records and administrative database	43	2269	0.53	Moderate
[42] Arokiasamy et al (2015)	6 low middle income countries (China, Ghana, India, Mexico, Russia, South Africa)	Multiple continents	Low or middle	Community	All adults	Not reported	42236	Self-report	8	9250	0.22	Moderate
[43] Sinnige et al (2015)	The Netherlands	Europe	High	Primary care	Middle aged and older	66.9	120480	Medical records and administrative database	29	74733	0.62	Moderate
[44] Zemedikun et al (2018)	UK	Europe	High	Community	Middle aged and older	Median age 58	502643	Medical records and administrative database	36	95710	0.19	Moderate
[45] Wensing et al (2001)	The Netherlands	Europe	High	Primary care	All adults	Not reported	3867	Self-report	25	626	0.16	Moderate
[46] Mounce et al (2018)	UK	Europe	High	Community	Middle aged and older	Not reported	4564	Self-report	15	1553	0.34	Moderate
[47] Taylor et al (2010)	Australia	Australasia	High	Community	All adults	Not reported	3206	Self-report	7	547	0.17	Low

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[48] Vancampfort et al (2019)	Six low and middle income countries (China, Ghana, India, Mexico, Russia, and South Africa)	Multiple continents	Low or middle	Community	Middle aged and older	62.4	34129	Self-report	11	15529	0.46	Moderate
[49] Vancampfort et al (2018)	Six low and middle income countries (China, Ghana, India, Mexico, Russia, and South Africa)	Multiple continents	Low or middle	Community	Only older people	72.6	14585	Self-report	11	8780	0.60	Moderate
[50] Aubert et al (2016)	Switzerland	Europe	High	Primary care	Middle aged and older	63.5	1002	Medical records and administrative database	17	676	0.67	Moderate
[51] Autenrieth et al (2013)	Germany	Europe	High	Community	Only older people	75.7	1007	Self-report	13	658	0.65	Moderate
[52] Bahler et al (2015)	Switzerland	Europe	High	Community	Only older people	74.9	229493	Medical records and administrative database	22	175752	0.77	Moderate
[53] Vancampfort et al (2017)	44 low and middle income countries	Multiple continents	Low or middle	Community	All adults	38.3	194431	Self-report	11	27518	0.14	Moderate
[54] Banjare et al (2014)	India	Asia	Low or middle	Community	Only older people	Not reported	310	Self-report	20	176	0.57	Moderate
[55] Barra et al (2015)	USA	North America	High	Community	All adults	45.36	43079	Self-report	Not reported	22412	0.52	Moderate
[56] Bernard et al (2016)	Australia	Australasia	High	Hospitals	Only older people	81.8	306	Medical records and administrative database	19	125	0.41	High
[57] Biswas et al (2019)	Bangladesh	Asia	Low or middle	Community	All adults	Not reported	8763	Self-report	3	1078	0.12	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[58] Blakemore et al (2016)	UK	Europe	High	Primary care	Only older people	75	4377	Self-report	24	2631	0.60	Moderate
[59] Blyth et al (2008)	Australia	Australasia	High	Community	Only older people	76.9	1685	Self-report	18	920	0.55	Moderate
[60] Bowling et al (2019)	USA	North America	High	Community	Middle aged and older	56.7	4217	Self-report	12	3053	0.72	Moderate
[61] Britt et al (2008)	Australia	Australasia	High	Primary care	All adults	Not reported	9156	Medical records and administrative database	18	3398	0.37	Moderate
[62] Broeiro-Goncalves et al (2019)	Portugal	Europe	High	Hospitals	All adults	59.8	800376	Medical records and administrative database	22	335357	0.42	Moderate
[63] Bruce et al (2010)	Canada	North America	High	Community	All adults	37.8	453	Self-report	4	163	0.36	High
[64] Burgers et al (2010)	France, Germany, Canada, Australia, Netherlands, New Zealand, UK, USA	Multiple continents	High	Community	All adults	Not reported	8973	Self-report	7	4037	0.45	Moderate
[65] Burke et al (2017)	US, Europe, Asia	Multiple continents	High	Community	Only older people	Not reported	4668	Self-report	9	2165	0.46	Moderate
[66] Buurman et al (2016)	The Netherlands	Europe	High	Hospitals	Only older people	78.2	639	Medical records and administrative database	35	440	0.69	Moderate
[67] Calderon-Larranaga et al (2017)	Sweden	Europe	High	Primary care	Only older people	74.6	3363	Self-report	60	2980	0.89	Moderate
[68] Camargo-Casas et al (2018)	Colombia	South America	Low or middle	Community	Only older people	71.1	2000	Self-report	12	808	0.40	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[69] Canevelli et al (2019)	Italy	Europe	High	Primary care	Only older people	75.1	185	Medical records and administrative database	18	162	0.88	High
[70] Chamberlain et al (2020)	USA	North America	High	Community	All adults	Not reported	198941	Self-report	21	78527	0.39	Low
[71] Chen et al (2018)	China	Asia	Low or middle	Community	Only older people	Not reported	30774	Medical records and administrative database	33	25101	0.82	Low
[72] Chen et al (2018)	China	Asia	Low or middle	Community	Middle aged and older	Not reported	3737	Self-report	16	1722	0.46	Moderate
[73] Cheung et al (2013)	Hong Kong (SAR of China)	Asia	High	Community	Middle aged and older	71.3	1145	Self-report	18	654	0.57	Moderate
[74] Chu et al (2018)	Hong Kong (SAR of China)	Asia	High	Primary care	Middle aged and older	Not reported	382	Medical records and administrative database	40	206	0.54	Moderate
[75] Chudasama et al (2019)	UK	Europe	High	Community	Middle aged and older	Median age:58	491939	Medical records and administrative database	36	96622	0.20	Moderate
[76] Cimarras-Otal et al (2014)	Spain	Europe	High	Community	All adults	Not reported	22190	Self-report	20	7830	0.35	Moderate
[77] Chin et al (2016)	Hong Kong (SAR of China)	Asia	High	Primary care	All adults	Median age: 48	9259	Self-report	8	2350	0.25	Moderate
[78] Agrawal et al (2016)	India, China, Russia, Mexico, South Africa, Ghana	Multiple continents	Low or middle	Community	All adults	57.8	40166	Self-report	9	9238	0.23	Moderate
[79] Gu et al (2018)	China	Asia	Low or middle	Community	Only older people	Not reported	411	Self-report	13	232	0.56	Moderate
[80] Gunn et al (2012)	Australia	Australasia	High	Primary care	All adults	50.89	6864	Self-report	12	2154	0.31	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[81] Han et al (2013)	USA	North America	High	Primary care	Only older people	76	159	Medical records and administrative database	18	117	0.74	High
[82] Hanlon et al (2018)	UK	Europe	High	Community	All adults	Not reported	493737	Medical records and administrative database	42	161576	0.33	Low
[83] Jantsch et al (2018)	Brazil	South America	Low or middle	Community	All adults	42	3092	Self-report	11	912	0.29	Moderate
[84] John et al (2003)	USA	North America	High	Community	Only older people	71.3	992	Self-report	11	732	0.74	High
[85] Johnson-Lawrence et al (2017)	USA	North America	High	Community	All adults	49.9	115097	Self-report	9	27278	0.24	Moderate
[86] Johnston et al (2019)	UK	Europe	High	Community	All adults	48	7184	Self-report	Not reported	388	0.05	Moderate
[87] Jones et al (2016)	USA	North America	High	Community	Only older people	Not reported	6964	Self-report	10	4951	0.71	Moderate
[88] Jovic et al (2016)	Serbia	Europe	Low or middle	Community	All adults	49.4	13103	Self-report	13	3522	0.27	Moderate
[89] Juul-Larsen et al (2020)	Denmark	Europe	High	Hospitals	Only older people	Median age: 78	369	Self-report	34	311	0.84	Moderate
[90] Hudon et al (2008)	Canada	North America	High	Community	All adults	Not reported	16782	Self-report	25	5343	0.32	Low
[91] Hussain et al (2015)	Indonesia	Asia	Low or middle	Community	Middle aged and older	Not reported	9438	Self-report	12	3369	0.36	Moderate
[92] Ie et al (2017)	USA	North America	High	Hospitals	Only older people	Not reported	1084	Medical records and administrative database	24	1036	0.96	High
[93] Ishizaki et al (2019)	Japan	Asia	High	Community	Only older people	76.9	2525	Self-report	9	1121	0.44	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[94] Danon-Hersch et al (2012)	Switzerland	Europe	High	Community	Only older people	Not reported	1283	Self-report	12	448	0.35	Moderate
[95] de Heer et al (2013)	USA	North America	High	Community	All adults	47.72	1002	Self-report	19	378	0.38	Moderate
[96] Demirchyan et al (2013)	Armenia	Asia	Low or middle	Community	All adults	58.8	721	Self-report	Not reported	564	0.78	High
[97] Fabbri et al (2015)	Italy	Europe	High	Community	Only older people	73.6	1018	Self-report	15	458	0.45	Moderate
[98] Fillenbaum et al (2000)	USA	North America	High	Community	Only older people	73.44	4034	Self-report	5	1181	0.29	Moderate
[99] Kaneko et al (2019)	Japan	Asia	High	Community	Only older people	Not reported	253	Self-report	Not reported	135	0.53	Moderate
[100] Kang et al (2017)	South Korea	Asia	High	Primary care	All adults	32.2	590	Medical records and administrative database	14	153	0.26	Moderate
[101] Gandhi et al (2020)	USA	North America	High	Community	All adults	Not reported	9499	Self-report	8	3379	0.36	Moderate
[102] Costa et al (2018)	Brazil	South America	Low or middle	Community	Only older people	Not reported	1451	Self-report	29	1343	0.93	Moderate
[103] Rizzuto et al (2017)	Sweden	Europe	High	Community	Only older people	Not reported	1099	Self-report	36	774	0.70	Moderate
[104] Dhalwani et al (2017)	UK	Europe	High	Community	Middle aged and older	Not reported	5476	Self-report	18	1156	0.21	Moderate
[105] Elixhauser et al (1998)	USA	North America	High	Hospitals	All adults	57.1	1779167	Medical records and administrative database	30	619150	0.35	Low
[106] Fabbri et al (2015)	USA	North America	High	Hospitals	Only older people	72.3	695	Self-report	15	440	0.63	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[107] Fortin et al (2014)	Canada	North America	High	Community	Middle aged and older	57.8	1196	Self-report	14	599	0.50	Moderate
[108] Fuchs et al (1998)	Israel	Asia	High	Community	Only older people	Not reported	1820	Self-report	14	1174	0.65	Moderate
[109] Galenkamp et al (2011)	The Netherlands	Europe	High	Community	Middle aged and older	69.2	2046	Self-report	7	876	0.43	High
[110] Galenkamp et al (2016)	Germany, UK, Italy, The Netherlands, Spain and Sweden	Europe	High	Community	Only older people	74.2	2792	Self-report	8	1358	0.49	Moderate
[111] Gamma et al (2001)	Switzerland	Europe	High	Community	All adults	Not reported	407	Self-report	14	53	0.13	High
[112] Ge et al (2018)	Singapore	Asia	High	Community	All adults	51.4	1940	Self-report	17	715	0.37	Moderate
[113] Ge et al (2019)	Singapore	Asia	High	Community	All adults	51.3	1932	Self-report	17	564	0.29	Moderate
[114] Gould et al (2016)	USA	North America	High	Community	Only older people	74.82	4184	Self-report	7	2932	0.70	Moderate
[115] Habib et al (2014)	Lebanon	Asia	Low or middle	Community	All adults	46.6	2501	Self-report	Not reported	665	0.27	Moderate
[116] Harrison et al (2017)	Australia	Australasia	High	Primary care	All adults	Not reported	8707	Medical records and administrative database	28	2838	0.33	Moderate
[117] Hayek et al (2017)	Israel	Asia	High	Community	All adults	47.2	4325	Self-report	10	1579	0.37	Moderate
[118] Henninger et al (2012)	USA	North America	High	Community	Only older people	76	3212	Self-report	9	1753	0.55	Moderate
[119] Hernandez et al (2019)	Ireland	Europe	High	Community	Middle aged and older	Not reported	6101	Self-report	31	4468	0.73	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[120] Ho et al (2014)	Singapore	Asia	High	Community	Middle aged and older	66.15	1844	Self-report	12	830	0.45	Moderate
[121] Khan et al (2019)	Bangladesh	Asia	Low or middle	Community	All adults	58.6	12338	Self-report	6	1031	0.08	Low
[122] Kiliari et al (2013)	Cyprus	Europe	High	Community	All adults	53	465	Self-report	Not reported	132	0.28	Moderate
[123] King et al (2018)	USA	North America	High	Community	All adults	Not reported	5541	Self-report	11	3342	0.60	Moderate
[124] Kingston et al (2018)	UK	Europe	High	Community	All adults	Not reported	9723900	Self-report	12	5250906	0.54	High
[125] Koyanagi et al (2018)	China, Ghana, India, Mexico, Russia, and South Africa	Multiple continents	Low or middle	Community	Middle aged and older	62.1	32715	Self-report	10	16324	0.50	Moderate
[126] Kriegsman et al (2004)	The Netherlands	Europe	High	Community	Middle aged and older	69.2	2489	Self-report	7	519	0.21	Moderate
[127] Kristensen et al (2019)	Germany	Europe	High	Community	Middle aged and older	63.47	19605	Self-report	13	12600	0.64	Moderate
[128] Kristensen et al (2019)	Germany	Europe	High	Community	Middle aged and older	64.37	7604	Self-report	13	5140	0.68	Moderate
[129] Kunna et al (2017)	China, Ghana	Multiple continents	Low or middle	Community	Middle aged and older	Not reported	15864	Self-report	7	4731	0.30	Low
[130] Kuwornu et al (2014)	Canada	North America	High	Community	All adults	51.05	3284	Self-report	15	1143	0.35	Moderate
[131] Lai et al (2019)	Hong Kong (SAR of China)	Asia	High	Community	All adults	Not reported	69636	Self-report	14	3898	0.06	Moderate
[132] Lai et al (2018)	Hong Kong (SAR of China)	Asia	High	Community	All adults	Not reported	300	Self-report	11	48	0.16	Moderate
[133] Laires et al (2019)	Portugal	Europe	High	Community	All adults	Not reported	15196	Self-report	13	6671	0.44	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[134] Lang et al (2015)	USA	North America	High	Community	Middle aged and older	53.4	3058	Self-report	6	948	0.31	Moderate
[135] Le Cossec et al (2016)	France	Europe	High	Community	Middle aged and older	70	15325	Self-report	4	3528	0.23	Moderate
[136] Lee et al (2007)	USA	North America	High	Hospitals	Middle aged and older	Not reported	741847	Medical records and administrative database	11	302792	0.41	Low
[137] Lee et al (2018)	Taiwan	Asia	High	Community	Only older people	Not reported	20898	Medical records and administrative database	Not reported	4234	0.20	High
[138] Li et al (2016)	UK	Europe	High	Primary care	All adults	Not reported	27806	Self-report	12	10332	0.37	Moderate
[139] Li et al (2019)	USA	North America	High	Community	Middle aged and older	67.4	14996	Self-report	8	9805	0.65	Moderate
[140] Lujic et al (2017)	Australia	Australasia	High	Community	Middle aged and older	70.2	90352	Self-report	8	33792	0.37	Moderate
[141] Lupianez-Villanueva et al (2018)	14 European countries	Europe	High	Community	All adults	Not reported	14000	Self-report	13	3416	0.24	Moderate
[142] Zhou et al (2018)	Bangladesh, India and China	Asia	Low or middle	Community	All adults	Not reported	18696	Self-report	9	3512	0.19	Moderate
[143] Zhang et al (2019)	China	Asia	Low or middle	Community	Only older people	70.5	11707	Self-report	11	5104	0.44	Moderate
[144] Wong et al (2010)	Canada	North America	High	Community	Only older people	Not reported	740	Self-report	7	489	0.66	Moderate
[145] Weimann et al (2016)	South Africa	Africa	Low or middle	Community	All adults	34	18526	Self-report	4	506	0.027	Moderate
[146] Wang et al (2017)	Australia	Australasia	High	Community	All adults	44	8820	Self-report	8	2539	0.29	Moderate
[147] Wang et al (2019)	South Africa	Africa	Low or middle	Community	Only older people	Not reported	2627	Self-report	5	439	0.17	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[148] Wade et al (2019)	New Zealand	Australasia	High	Community	All adults	59.05	7654	Self-report	12	2786	0.36	Moderate
[149] Maciejewski et al (2019)	USA	North America	High	Community	Only older people	77.1	20124230	Medical records and administrative database	19	14425446	0.72	Moderate
[150] Marengoni et al (2016)	Sweden	Europe	High	Community	Only older people	74.4	3155	Medical records and administrative database	14	1654	0.52	Moderate
[151] Marengoni et al (2009)	Sweden	Europe	High	Community	Only older people	Not reported	1099	Self-report	22	575	0.52	Moderate
[152] Marques et al (2018)	13 European countries	Europe	High	Community	All adults	50.2	32931	Self-report	6	7113	0.22	Moderate
[153] Mavaddat et al (2014)	UK	Europe	High	Primary care	Middle aged and older	58.7	11439	Self-report	6	1006	0.09	Moderate
[154] McDaid et al (2013)	Ireland	Europe	High	Community	Middle aged and older	Not reported	6018	Self-report	8	733	0.12	High
[155] Melis et al (2014)	Sweden	Europe	High	Hospitals	Only older people	83.75	390	Medical records and administrative database	39	213	0.55	Moderate
[156] Min et al (2007)	USA	North America	High	Community	Only older people	81	372	Self-report	9	230	0.62	High
[157] Momtaz et al (2010)	Malaysia	Asia	High	Community	Only older people	69.26	385	Self-report	16	165	0.43	Moderate
[158] Mondor et al (2018)	Canada	North America	High	Community	All adults	Not reported	27195	Medical records and administrative database	17	11390	0.42	Moderate
[159] Muggah et al (2012)	Canada	North America	High	Community	All adults	Not reported	28450000	Medical records and administrative database	9	4523550	0.16	Moderate
[160] Nagel et al (2008)	Germany	Europe	High	Community	Middle aged and older	56.5	13781	Self-report	15	9275	0.67	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[161] Niedzwiedz et al (2019)	USA	North America	High	Community	Middle aged and older	67.2	2272	Self-report	8	1491	0.66	Moderate
[162] Nunes et al (2016)	Brazil	South America	Low or middle	Community	All adults	45.75	2927	Self-report	11	852	0.29	Moderate
[163] Nunes et al (2017)	Brazil	South America	Low or middle	Community	All adults	43.7	60202	Self-report	22	13365	0.22	Moderate
[164] Nunes et al (2015)	Brazil	South America	Low or middle	Community	Only older people	Not reported	1593	Self-report	17	1295	0.81	Moderate
[165] Olaya et al (2017)	Spain	Europe	High	Community	Only older people	71.75	2113	Self-report	7	1088	0.51	Moderate
[166] Olivares et al (2017)	Argentina	South America	High	Community	All adults	43	1044	Self-report	Not reported	346	0.33	Moderate
[167] Park et al (2018)	South Korea	Asia	High	Community	Middle aged and older	62.7	5996	Self-report	25	1607	0.27	Moderate
[168] Patel et al (2006)	Mexico	South America	Low or middle	Community	Middle aged and older	73	7852	Self-report	5	1833	0.23	Moderate
[169] Pati et al (2016)	India	Asia	Low or middle	Community	All adults	44.96	103	Self-report	18	24	0.23	Moderate
[170] Pati et al (2019)	India	Asia	Low or middle	Primary care	All adults	44	1649	Self-report	21	567	0.34	Moderate
[171] Payne et al (2013)	UK	Europe	High	Primary care	All adults	49	180815	Medical records and administrative database	40	54945	0.30	Moderate
[172] Perez et al (2020)	Sweden	Europe	High	Community	Only older people	72.8	2596	Self-report	60	2213	0.85	Moderate
[173] Petersen et al (2019)	South Africa	Africa	Low or middle	Primary care	All adults	Not reported	2549	Self-report	Not reported	893	0.35	Moderate
[174] Pfortmueller et al (2013)	Switzerland	Europe	High	Hospitals	All adults	Median age: 28	3170	Medical records and administrative database	18	1183	0.37	High

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[175] Pressley et al (1999)	USA	North America	High	Hospitals	Only older people	Not reported	5934	Medical records and administrative database	Not reported	3534	0.60	Moderate
[176] Prior et al (2016)	Denmark	Europe	High	Community	All adults	Not reported	118410	Self-report	39	33937	0.29	Moderate
[177] Ribeiro et al (2018)	Brazil	South America	High	Community	Only older people	70	820	Self-report	8	270	0.33	Moderate
[178] Ruel et al (2014)	Australia	Australasia	High	Community	All adults	50	1854	Self-report	8	585	0.32	Moderate
[179] Ruel et al (2014)	China	Asia	Lor or middle	Community	All adults	49	1020	Self-report	11	346	0.34	Moderate
[180] Ryan et al (2018)	Ireland	Europe	High	Community	Middle aged and older	Not reported	4823	Self-report	16	2588	0.54	Moderate
[181] Schmidt et al (2016)	Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, and Switzerland	Europe	High	Community	Only older people	Not reported	56609	Self-report	11	13794	0.24	Moderate
[182] Schottker et al (2016)	Germany	Europe	High	Primary care	Middle aged and older	Median age:70	2547	Medical records and administrative database	14	251	0.10	Moderate
[183] Seo et al (2017)	South Korea	Asia	High	Community	Middle aged and older	Not reported	156747	Self-report	15	42006	0.27	Moderate
[184] She et al (2019)	China	Asia	Low or middle	Hospitals	Only older people	68.9	1497	Self-report	22	1255	0.84	Moderate
[185] Singh et al (2019)	India	Asia	Low or middle	Community	All adults	41	16287	Self-report	5	1531	0.09	Moderate
[186] Stepanova et al (2015)	USA	North America	High	Community	All adults	34.7	26225	Self-report	13	9992	0.38	High
[187] Stickley et al (2020)	USA	North America	High	Community	All adults	44.9	15311	Self-report	9	3996	0.26	High

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[188] Streit et al (2014)	Switzerland	Europe	High	Primary care	Middle aged and older	63.5	1002	Medical records and administrative database	17	676	0.67	Moderate
[189] Stubbs et al (2018)	China, Ghana, India, Mexico, Russia, South Africa	Multiple continents	Low or middle	Community	Middle aged and older	62.4	34129	Self-report	13	19317	0.57	Moderate
[190] Su et al (2016)	China	Asia	Low or middle	Community	Only older people	Not reported	2058	Self-report	10	1012	0.49	Moderate
[191] Sundstrup et al (2017)	USA	North America	High	Community	All adults	43.5	10427	Self-report	8	2489	0.24	High
[192] Takahashi et al (2016)	USA	North America	High	Hospitals	All adults	57	6402	Medical records and administrative database	Not reported	3140	0.49	High
[193] Tinetti et al (2011)	USA	North America	High	Community	Only older people	72.6	5298	Self-report	5	1200	0.23	High
[194] Troelstra et al (2020)	The Netherlands	Europe	High	Community	All adults	Not reported	604	Self-report	26	321	0.53	High
[195] van Zon et al (2020)	USA	North America	High	Community	Middle aged and older	53.8	10719	Self-report	8	2390	0.22	Moderate
[196] Vancampfort et al (2017)	China, Ghana, India, Mexico, Russia, and South Africa	Multiple continents	Low or middle	Community	All adults	Median age: 62	32585	Self-report	11	14524	0.45	Moderate
[197] Vassilaki et al (2015)	USA	North America	High	Primary care	Only older people	78.5	2176	Medical records and administrative database	17	1884	0.87	Moderate
[198] Vassilaki et al (2016)	USA	North America	High	Primary care	Only older people	79	1449	Medical records and administrative database	17	1237	0.85	Moderate
[199] Villarreal et al (2015)	Panama	South America	High	Primary care	Only older people	78.2	304	Self-report	7	227	0.75	Moderate
[200] Violan et al (2019)	Spain	Europe	High	Primary care	Only older people	75.4	916619	Medical records and	60	853085	0.93	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
								administrative database				
[201] von Strauss et al (2000)	Sweden	Europe	High	Community	Only older people	Not reported	502	Self-report	15	155	0.31	Moderate
[202] Vos et al (2013)	The Netherlands	Europe	High	Community	Only older people	71.9	315	Self-report	21	202	0.64	Moderate
[203] Vu et al (2019)	Vietnam	Asia	Low or middle	Hospitals	Only older people	71.9	405	Medical records and administrative database	Not reported	146	0.36	High
[204] Wang et al (2018)	USA	North America	High	Community	All adults	47	3086	Self-report	20	1109	0.36	Moderate
[205] Wang et al (2017)	China	Asia	Low or middle	Community	Only older people	69.24	2705	Self-report	17	1230	0.45	Moderate
[206] Wijers et al (2019)	Spain	Europe	High	Community	Middle aged and older	74.2	707	Self-report	21	491	0.69	Moderate
[207] Williams et al (2016)	USA	North America	High	Community	All adults	Not reported	23789	Self-report	9	9213	0.39	Moderate
[208] Woldesemayat et al (2018)	Ethiopia	Africa	Low or middle	Primary care	All adults	Not reported	411	Self-report	18	73	0.18	Moderate
[209] Yao et al (2020)	China	Asia	Low or middle	Community	Middle aged and older	57.7	10084	Self-report	15	3243	0.32	Moderate
[210] Yorke et al (2017)	USA	North America	High	Community	Middle aged and older	66.6	5877	Self-report	7	3391	0.58	Moderate
[211] You et al (2019)	China	Asia	Low or middle	Community	Only older people	72	5296	Self-report	27	2201	0.42	Moderate
[212] Zhang et al (2020)	China	Asia	Low or middle	Community	Only older people	74.14	4348	Self-report	15	2338	0.54	Moderate
[213] Khanam et al (2011)	Bangladesh	Asia	Low or middle	Community	Only older people	69.5	452	Medical records and administrative database	9	243	0.54	Moderate

Author	Country	Continent	Country income	Setting	Study population	Mean age	No of participants	Source	No of conditions measured	No of MM cases	Proportion with MM	Risk of bias
[214] Cornell et al (2009)	USA	North America	High	Primary care	All adults	62.4	1645314	Medical records and administrative database	45	1327382	0.81	Moderate
[215] Cassell et al (2018)	UK	Europe	High	Primary care	All adults	Not reported	403985	Medical records and administrative database	36	109884	0.27	Moderate
[216] Wong et al (2019)	Hong Kong (SAR of China)	Asia	High	Community	All adults	45.67	1014	Self-report	5	124	0.12	Moderate
[217] Puth et al (2017)	Germany	Europe	High	Community	All adults	Not reported	19294	Self-report	17	7640	0.40	Moderate

MM: Multimorbidity. No of participants is the total number of participants in the denominator for estimating prevalence in a study (which could be a subset in some included studies)

Table S5: Associations between predictors

	Mean age (lm) Unadjusted coefficient estimates	**No of conditions (nb) Unadjusted incident rate ratio**
Mean age		1·0 (1.0-1.0)
Source		
Self-report	59.7 (57.1-62.3) (intercept)	Ref
Database	7.0 (1.5-12.5)*	1.8 (1.5-2.2)***
Continent		
Europe	66.8 (62.8-70.9) (intercept)	Ref
North America	-7.0 (-12.8 to -1.1)*	0.6 (0.5-0.8)***
Australasia	-8.0 (-17.5-1.6)	0.8 (0.6-1.1)
Asia	-8.4 (-14.6 to -2.2)**	0.6 (0.5-0.8)***
South America	-8.5 (-18.0-1.1)	0.6 (0.4-0.9)**
Africa	-32.8 (-57.8 to -8.0)**	0.4 (0.2-0.8)*
Multiple continents	-7.6 (-18.3-3.2)	0.5 (0.3-0.7)***
Setting		
Community	59.8 (57.2-62.5) (intercept)	Ref
Primary care	3.5 (-2.5-9.6)	1.7 (1.4-2.1)***
Hospitals	10.2 (1.5-19.0)*	1.8 (1.3-2.4)***
Study population		
All adults	48.3 (46.6-50.0) (intercept)	Ref
Middle-aged and older	15.4 (12.7-18.0)***	0.9 (0.7-1.1)
Only older people	26.2 (23.7-28.7)***	1.2 (0.9-1.4)

*<0.05 **<0.01 ***<0.001

Ref: Reference category. lm: Linear regression. nb: Negative binomial regression

Table S6: Risk of bias assessment of included studies

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[25.] Aarts et al (2012)	Moderate	Moderate	Moderate	High	Low	Low	Moderate	Low	Moderate	Yes
[26.] Aarts et al (2011)	Low	High	Moderate	High	Moderate	Moderate	Moderate	Low	Moderate	No
[27.] Aarts et al (2011)	Moderate	Moderate	Moderate	High	Low	Low	Moderate	Low	Moderate	Yes
[28.] Abizanda et al (2014)	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[29.] Agborsangaya et al (2012)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[30.] Agborsangaya et al (2013)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[31.] Agborsangaya et al (2014)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[32.] Ahrenfeldt et al (2019)	Low	Moderate	Moderate	High	Low	High	Moderate	Low	Moderate	No
[33.] Alimohammadian et al (2017)	Low	Moderate	Moderate	High	Low	High	Moderate	Low	Moderate	Yes
[34.] Angst et al (2002)	Moderate	Moderate	Moderate	High	Low	High	High	Unclear	High	No
[35.] Appa et al (2014)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[36.] Adams et al (2017)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[37.] Ahmadi et al (2016)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[38.] Amaral et al (2018)	High	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[39.] An et al (2016)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[40.] Araujo et al (2018)	Low	Moderate	Low	High	Moderate	High	Moderate	Low	Moderate	Yes
[41.] Arnold-Reed et al (2018)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[42.] Arokiasamy et al (2015)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[43.] Sinnige et al (2015)	Low	Moderate	Moderate	High	Low	Low	Moderate	Low	Moderate	Yes
[44.] Zemedikun et al (2018)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[45.] Wensing et al (2001)	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate	Unclear	Moderate	Yes
[46.] Mounce et al (2018)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[47.] Taylor et al (2010)	Low	Moderate	Moderate	High	Low	Low	Moderate	Low	Low	Yes
[48.] Vancampfort et al (2019)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[49.] Vancampfort et al (2018)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[50.] Aubert et al (2016)	Moderate	Moderate	Moderate	High	Moderate	Low	Moderate	Low	Moderate	Yes
[51.] Autenrieth et al (2013)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[52.] Bahler et al (2015)	Low	Moderate	Moderate	High	Moderate	Low	Moderate	Low	Moderate	Yes
[53.] Vancampfort et al (2017)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[54.] Banjare et al (2014)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[55.] Barra et al (2015)	Moderate	Moderate	High	High	Moderate	High	Moderate	Unclear	Moderate	No
[56.] Bernard et al (2016)	High	Moderate	High	High	Moderate	Low	Moderate	Low	High	No
[57.] Biswas et al (2019)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	No
[58.] Blakemore et al (2016)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	No
[59.] Blyth et al (2008)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[60.] Bowling et al (2019)	Low	Moderate	Moderate	High	Moderate	Low	Moderate	Low	Moderate	Yes
[61.] Britt et al (2008)	Low	Moderate	High	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[62.] Broeiro-Goncalves (2019)	Low	Moderate	High	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[63.] Bruce et al (2010)	High	Moderate	Moderate	High	Low	High	Moderate	Unclear	High	No
[64.] Burgers et al (2010)	Low	Moderate	High	High	Moderate	Low	Moderate	Low	Moderate	Yes
[65.] Burke et al (2017)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[66.] Buurman et al (2016)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[67.] Calderon-Larranaga et al (2017)	Moderate	Moderate	Moderate	High	Low	Low	Moderate	Low	Moderate	Yes
[68.] Camargo-Casas et al (2018)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[69.] Canevelli et al (2019)	High	High	High	High	Moderate	High	Moderate	Low	High	Yes
[70.] Chamberlain et al (2020)	Low	Moderate	Moderate	High	Low	Low	Moderate	Low	Low	Yes
[71.] Chen et al (2018)	Low	Moderate	High	High	Low	Low	Moderate	Low	Low	Yes
[72.] Chen et al (2018)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[73.] Cheung et al (2013)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[74.] Chu et al (2018)	Low	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[75.] Chudasama et al (2019)	Moderate	Moderate	Low	High	Moderate	Low	Moderate	Low	Moderate	Yes
[76.] Cimarras-Otal et al (2014)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[77.] Chin et al (2016)	Moderate	Moderate	Moderate	High	Moderate	Low	Moderate	Low	Moderate	Yes
[78.] Agrawal et al (2016)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[79.] Gu et al (2018)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[80.] Gunn et al (2012)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[81.] Han et al (2013)	High	High	Moderate	High	Moderate	High	Moderate	Unclear	High	No
[82.] Hanlon et al (2018)	Low	Moderate	Moderate	High	Low	Low	Moderate	Low	Low	Yes
[83.] Jantsch et al (2018)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[84.] John et al (2003)	Moderate	High	Moderate	High	Low	High	Moderate	Low	High	No
[85.] Johnson-Lawrence et al (2017)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[86.] Johnston et al (2019)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	No
[87.] Jones et al (2016)	Low	Moderate	Moderate	High	Low	Low	Moderate	Unclear	Moderate	Yes
[88.] Jovic et al (2016)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[89.] Juul-Larsen et al (2020)	High	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[90.] Hudon et al (2008)	Low	Moderate	Moderate	High	Low	Low	Moderate	Low	Low	Yes
[91.] Hussain et al (2015)	Moderate	Moderate	High	High	Moderate	Low	Moderate	Low	Moderate	Yes
[92.] Ie et al (2017)	High	High	Moderate	High	Moderate	Low	Moderate	Low	High	Yes
[93.] Ishizaki et al (2019)	Moderate	Moderate	Low	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[94.] Danon-Hersch et al (2012)	Moderate	High	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[95.] de Heer et al (2013)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[96.] Demirchyan et al (2013)	High	Moderate	Low	High	Moderate	High	Moderate	Low	High	No
[97.] Fabbri et al (2015)	Moderate	Moderate	High	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[98.] Fillenbaum et al (2000)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[99.] Kaneko et al (2019)	Moderate	Moderate	High	High	Moderate	Low	Moderate	Low	Moderate	No
[100.] Kang et al (2017)	High	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[101.] Gandhi et al (2020)	Moderate	Moderate	Moderate	High	High	High	Moderate	Low	Moderate	Yes
[102.] Costa et al (2018)	High	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[103.] Rizzuto et al (2017)	High	Moderate	High	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[104.] Dhalwani et al (2017)	Moderate	Moderate	Low	High	Moderate	High	Moderate	Low	Moderate	Yes
[105.] Elixhauser et al (1998)	Low	Moderate	High	High	Low	Low	Moderate	Unclear	Low	Yes
[106.] Fabbri et al (2015)	High	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[107.] Fortin et al (2014)	Low	Moderate	Low	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[108.] Fuchs et al (1998)	Moderate	Moderate	Moderate	High	Moderate	Low	Moderate	Unclear	Moderate	No
[109.] Galenkamp et al (2011)	Low	Moderate	High	High	Moderate	High	Moderate	Unclear	High	No
[110.] Galenkamp et al (2016)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[111.] Gamma et al (2001)	High	Moderate	High	High	Moderate	High	Moderate	Unclear	High	No
[112.] Ge et al (2018)	Moderate	Moderate	High	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[113.] Ge et al (2019)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[114.] Gould et al (2016)	Moderate	Moderate	Moderate	High	High	High	Moderate	Unclear	Moderate	Yes
[115.] Habib et al (2014)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	No
[116.] Harrison et al (2017)	Low	Moderate	High	High	Moderate	Low	Moderate	Unclear	Moderate	No
[117.] Hayek et al (2017)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[118.] Henninger et al (2012)	Moderate	Moderate	High	High	Moderate	High	Moderate	Unclear	Moderate	No
[119.] Hernandez et al (2019)	Moderate	Moderate	Moderate	High	High	High	Moderate	Unclear	Moderate	Yes
[120.] Ho et al (2014)	Moderate	Moderate	High	High	Low	Low	Moderate	Low	Moderate	Yes
[121.] Khan et al (2019)	Low	Moderate	Low	High	Low	High	Moderate	Low	Low	Yes
[122.] Kiliari et al (2013)	High	Moderate	High	High	Moderate	Moderate	Moderate	Low	Moderate	No
[123.] King et al (2018)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[124.] Kingston et al (2018)	Low	Moderate	High	High	Moderate	High	Moderate	Unclear	High	Yes
[125.] Koyanagi et al (2018)	Low	Moderate	Moderate	High	Moderate	Low	High	Low	Moderate	Yes
[126.] Kriegsman et al (2004)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[127.] Kristensen et al (2019)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[128.] Kristensen et al (2019)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[129.] Kunna et al (2017)	Low	Moderate	Low	High	Moderate	Low	High	Low	Low	Yes
[130.] Kuwornu et al (2014)	Moderate	Moderate	High	High	Moderate	Low	Moderate	Low	Moderate	Yes
[131.] Lai et al (2019)	Low	Moderate	High	High	Moderate	Low	Moderate	Low	Moderate	Yes
[132.] Lai et al (2018)	High	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[133.] Laires et al (2019)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[134.] Lang et al (2015)	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[135.] Le Cossec et al (2016)	Low	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[136.] Lee et al (2007)	Low	Moderate	High	High	Low	Low	Moderate	Low	Low	Yes
[137.] Lee et al (2018)	Low	Moderate	High	High	High	Low	Moderate	Unclear	High	No
[138.] Li et al (2016)	Low	Low	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[139.] Li et al (2019)	Low	Moderate	Low	High	Moderate	Moderate	Moderate	Low	Moderate	No
[140.] Lujic et al (2017)	Low	Moderate	Moderate	High	Low	High	Moderate	Low	Moderate	Yes
[141.] LupianezUnclearVillanueva et al (2018)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[142.] Zhou et al (2018)	Moderate	Moderate	Moderate	High	Moderate	Low	High	Low	Moderate	Yes
[143.] Zhang et al (2019)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[144.] Wong et al (2010)	High	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[145.] Weimann et al (2016)	Low	Moderate	Low	High	Moderate	High	Moderate	Low	Moderate	Yes
[146.] Wang et al (2017)	Low	Moderate	Low	High	Moderate	High	Moderate	Low	Moderate	Yes
[147.] Wang et al (2019)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	No
[148.] Wade et al (2019)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[149.] Maciejewski et al (2019)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[150.] Marengoni et al (2016)	Moderate	Moderate	High	High	Moderate	High	Moderate	Low	Moderate	Yes
[151.] Marengoni et al (2009)	Moderate	Moderate	High	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[152.] Marques et al (2018)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[153.] Mavaddat et al (2014)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[154.] McDaid et al (2013)	Low	Moderate	High	High	Moderate	High	Moderate	Low	High	Yes
[155.] Melis et al (2014)	High	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[156.] Min et al (2007)	High	Moderate	High	High	Moderate	High	Moderate	Unclear	High	Yes
[157.] Momtaz et al (2010)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[158.] Mondor et al (2018)	Low	Moderate	Low	High	Moderate	High	Moderate	Low	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[159.] Muggah et al (2012)	Low	Moderate	High	High	Moderate	Low	Moderate	Low	Moderate	No
[160.] Nagel et al (2008)	Low	Moderate	Low	High	Moderate	High	Moderate	Low	Moderate	Yes
[161.] Niedzwiedz et al (2019)	Moderate	Moderate	High	High	Moderate	Low	Moderate	Unclear	Moderate	Yes
[162.] Nunes et al (2016)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[163.] Nunes et al (2017)	Low	Moderate	Moderate	High	Low	High	Moderate	Low	Moderate	Yes
[164.] Nunes et al (2015)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[165.] Olaya et al (2017)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[166.] Olivares et al (2017)	High	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	No
[167.] Park et al (2018)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	No
[168.] Patel et al (2006)	Moderate	Moderate	High	High	Moderate	High	Moderate	Unclear	Moderate	No
[169.] Pati et al (2016)	High	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[170.] Pati et al (2019)	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[171.] Payne et al (2013)	Low	Moderate	Moderate	High	Moderate	Low	Moderate	Unclear	Moderate	Yes
[172.] Perez et al (2020)	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[173.] Petersen et al (2019)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	No

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[174.] Pfortmueller et al (2013)	Moderate	Moderate	High	High	High	High	Moderate	Unclear	High	No
[175.] Pressley et al (1999)	Low	Moderate	High	High	Moderate	Low	Moderate	Unclear	Moderate	No
[176.] Prior et al (2016)	Low	Moderate	Moderate	High	Moderate	Low	Moderate	Unclear	Moderate	Yes
[177.] Ribeiro et al (2018)	High	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[178.] Ruel et al (2014)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[179.] Ruel et al (2014)	Moderate	Moderate	Moderate	High	Low	High	Moderate	Low	Moderate	Yes
[180.] Ryan et al (2018)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[181.] Schmidt et al (2016)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[182.] Schottker et al (2016)	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Moderate	Yes
[183.] Seo et al (2017)	Low	Moderate	Moderate	High	Low	High	Moderate	Low	Moderate	No
[184.] She et al (2019)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[185.] Singh et al (2019)	Low	Moderate	Moderate	High	Low	Low	Moderate	Unclear	Moderate	Yes
[186.] Stepanova et al (2015)	Low	High	High	High	High	High	High	Unclear	High	Yes
[187.] Stickley et al (2020)	Low	Moderate	High	High	Moderate	High	Moderate	Low	High	Yes
[188.] Streit et al (2014)	Moderate	Moderate	Moderate	High	High	High	Moderate	Unclear	Moderate	Yes

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[189.] Stubbs et al (2018)	Low	Moderate	High	High	Moderate	Low	Moderate	Low	Moderate	Yes
[190.] Su et al (2016)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[191.] Sundstrup et al (2017)	Low	Moderate	High	High	Moderate	High	Moderate	Unclear	High	Yes
[192.] Takahashi et al (2016)	Moderate	Moderate	High	High	High	Low	Moderate	Low	High	No
[193.] Tinetti et al (2011)	Low	Moderate	High	High	High	High	Moderate	Unclear	High	No
[194.] Troelstra et al (2020)	High	Moderate	High	High	Moderate	Low	Moderate	Unclear	High	Yes
[195.] van Zon et al (2020)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[196.] Vancampfort et al (2017)	Low	Moderate	Moderate	High	Moderate	Low	Moderate	Low	Moderate	Yes
[197.] Vassilaki et al (2015)	Low	Moderate	Moderate	High	Moderate	Low	Moderate	Unclear	Moderate	Yes
[198.] Vassilaki et al (2016)	Low	Moderate	Moderate	High	Moderate	Low	Moderate	Unclear	Moderate	Yes
[199.] Villarreal et al (2015)	High	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	No
[200.] Violan et al (2019)	Low	Moderate	Moderate	High	High	Low	Moderate	Low	Moderate	Yes
[201.] von Strauss et al (2000)	Moderate	Moderate	Moderate	High	Moderate	Low	Moderate	Low	Moderate	No
[202.] Vos et al (2013)	Moderate	Moderate	High	High	Moderate	High	Moderate	Low	Moderate	No
[203.] Vu et al (2019)	High	Moderate	High	High	Moderate	High	Moderate	Low	High	No

Author	Selection bias	Study design	Confounders	Blinding	Data collection method	Withdrawals and dropouts	Publication bias	Conflict of interest	Overall rating	Reporting of MM measure and definition
[204.] Wang et al (2018)	Moderate	Moderate	Low	High	Moderate	Low	Moderate	Unclear	Moderate	Yes
[205.] Wang et al (2017)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[206.] Wijers et al (2019)	Low	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	No
[207.] Williams et al (2016)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	No
[208.] Woldesemayat et al (2018)	High	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[209.] Yao et al (2020)	Moderate	Moderate	Low	High	Moderate	High	Moderate	Low	Moderate	Yes
[210.] Yorke et al (2017)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[211.] You et al (2019)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Low	Moderate	Yes
[212.] Zhang et al (2020)	Moderate	Moderate	Low	High	Moderate	Low	Moderate	Low	Moderate	Yes
[213.] Khanam et al (2011)	Moderate	Moderate	Moderate	High	Moderate	Low	Moderate	Unclear	Moderate	Yes
[214.] Cornell et al (2009)	Low	Moderate	High	High	Moderate	Low	Moderate	Unclear	Moderate	Yes
[215.] Cassell et al (2018)	Low	Moderate	High	High	Moderate	Moderate	Moderate	Low	Moderate	No
[216.] Wong et al (2019)	High	Moderate	Moderate	High	Moderate	High	Moderate	Unclear	Moderate	Yes
[217.] Puth et al (2017)	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate	Low	Moderate	Yes

Table S7: Output of adjusted meta-analytic model based on 217 studies

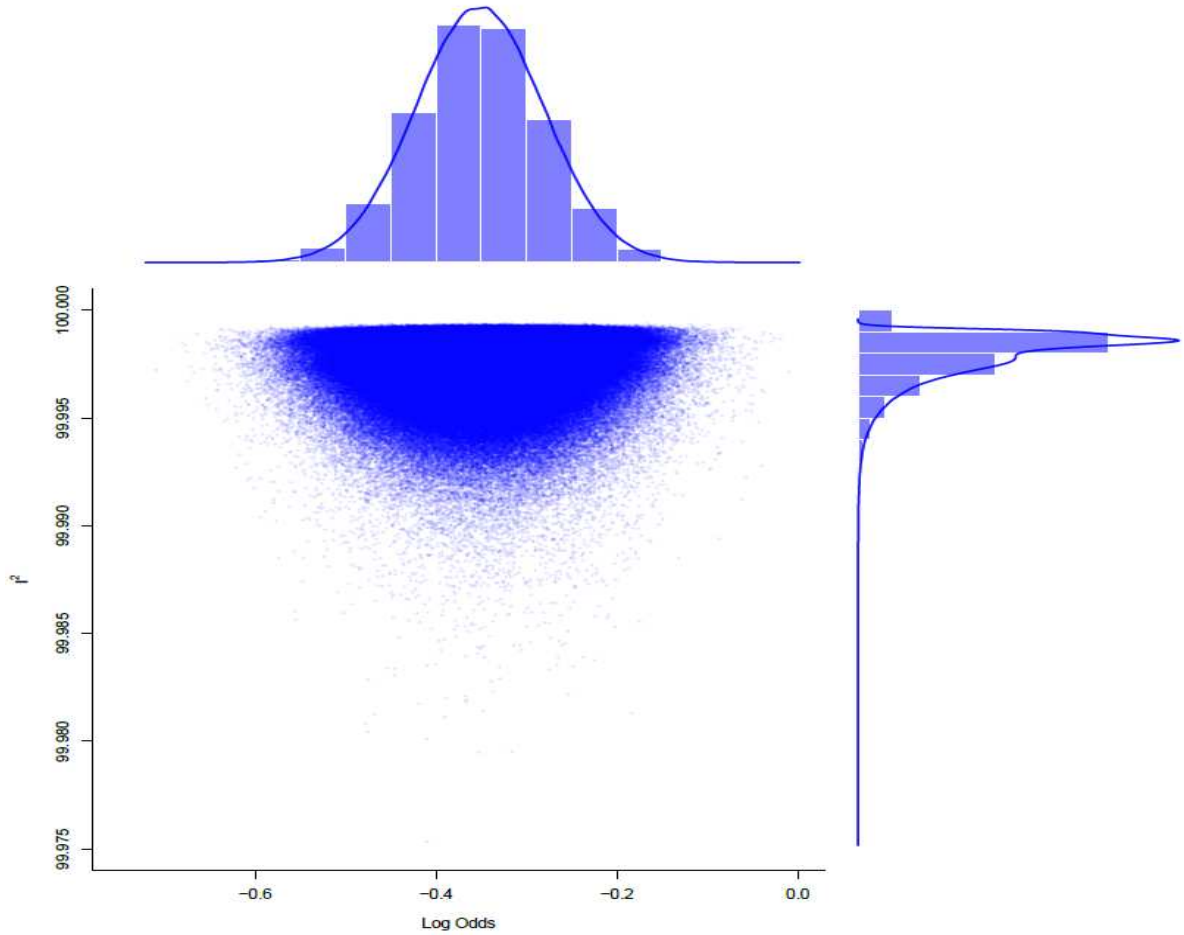
	Pooled prevalence of multimorbidity of each subgroup (%, 95% CI)	**Meta-regression Unadjusted Odds Ratio (95% CI)**	**Meta-regression Adjusted Odds Ratio (95% CI) R^2 42.4%**	**FMI**
Group of mean age		R^2 27.0%		
<59	30.4 (27.0-33.9)	Ref	Ref	Ref
59-73	43.5 (38.0-49.1)	1.8 (1.3-2.3)***	2.0 (1.6-2.6)***	0.3
≥74	67.8 (61.3-73.7)	6.4 (4.6-8.9)***	4.7 (3.4-6.5)***	0.2
No of conditions		R^2 6.9%		
<9	29.9 (24.9-35.4)	Ref	Ref	Ref
9-19	43.5 (39.1-47.9)	1.8 (1.3-2.5)***	1.7 (1.3-2.2)***	0.1
20-43	46.7 (38.4-55.2)	2.1 (1.4-3.1)***	2.2 (1.5-3.3)***	0.2
≥44	54.5 (32.6-74.8)	2.8 (1.5-5.4)**	2.8 (1.6-4.8)***	0.1
Setting		R^2 3.7%		
Community	37.8 (34.4-41.4)	Ref	Ref	Ref
Primary care	51.2 (41.6-60.7)	1.7 (1.2-2.5)**	1.8 (1.2-2.6)**	0.1
Hospital	47.1 (31.9-63.0)	1.5 (0.9-2.4)	0.8 (0.5-1.3)	0.1
Care home	73.9 (72.8-74.9)	4.6 (0.6-36.6)	1.5 (0.3-8.4)	0.04
Source		R^2 2.8%		
Self-report	38.3 (34.4-42.2)	Ref	Ref	Ref
Database	48.9 (42.2-55.6)	1.5 (1.1-2.1)**	0.8 (0.6-1.1)	0.1
Continent		R^2 7.4%		
North America	48.9 (42.1-55.7)	Ref	Ref	Ref
Europe	44.0 (37.7-50.4)	0.8 (0.6-1.2)	0.5 (0.4-0.7)***	0.1
Australasia	28.2 (20.3-37.6)	0.4 (0.2-0.8)**	0.4 (0.2-0.6)***	0.08
Asia	34.3 (28.6-40.5)	0.5 (0.4-0.8)**	0.5 (0.3-0.7)***	0.1
South America	47.5 (31.2-64.4)	0.9 (0.5-1.8)	0.8 (0.5-1.3)	0.1
Africa	13.8 (4.5-35.2)	0.2 (0.06-0.5)***	0.2 (0.1-0.5)***	0.1
Multiple continents	41.4 (31.0-52.6)	0.7 (0.4-1.4)	0.7 (0.4-1.2)	0.1

*<0.05 **<0.01 ***<0.001
Ref: Reference category. FMI: Fraction of missing information.

Table S8: Definition of variables

Variable name	Definition
Study setting	
Community	Studies that used population surveys, insurance claims databases, or research databases
Primary care	Studies that were carried out in primary care settings
Hospital	Studies that were carried out in hospital settings
Data source	
Self-report	Studies that collected data using self-report or interviews
Medical records and administrative databases	Studies that collected data using electronic medical records, medical chart reviews, insurance claims databases, pharmacy databases, or research databases
Study population	
All adults	Studies with a sample of population aged 18 and older (n=45), aged 20 and older (n=8), aged 21 and older (n=3), aged 25 and older (n=2), or others (n=27) (e.g. aged 16 and older, or aged 17 and older)
Middle-aged and older	Studies with a sample of population aged 50 and older (n=25), aged 40 and older (n=5), aged 40 and older (n=10), or others (n=6) (e.g. aged 57 and older, or aged 45 and older)
Only older people	Studies with a sample of population aged 65 and older (n=22), aged 60 and older (n=25), aged 70 and older (n=5) or others (n=11) (e.g. aged 68 and older, aged 77 and older, aged 78 and older, or aged 80 and older)

Figure S1: Graphical display of study effect sizes and heterogeneity



No obvious subgroup effects were identified

Figure S2: Process of examining and identifying outlying studies in meta-analysis

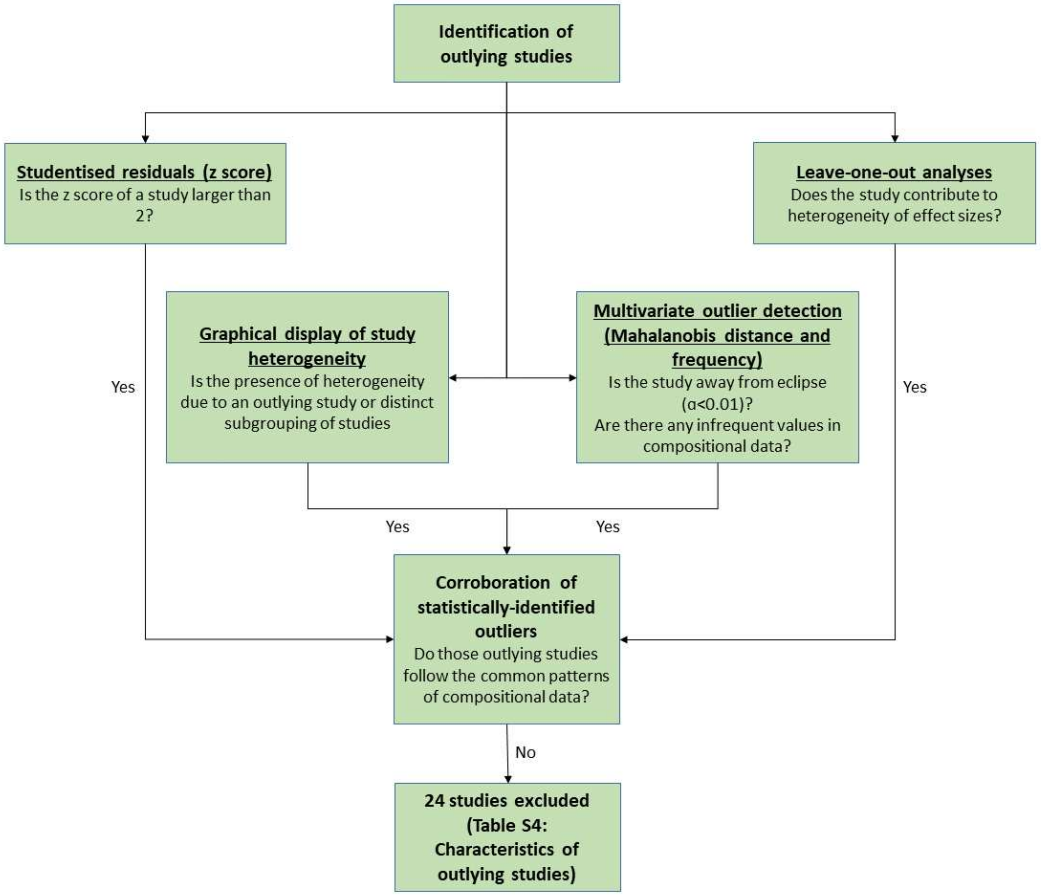


Figure S3: Summary of risk of bias assessment

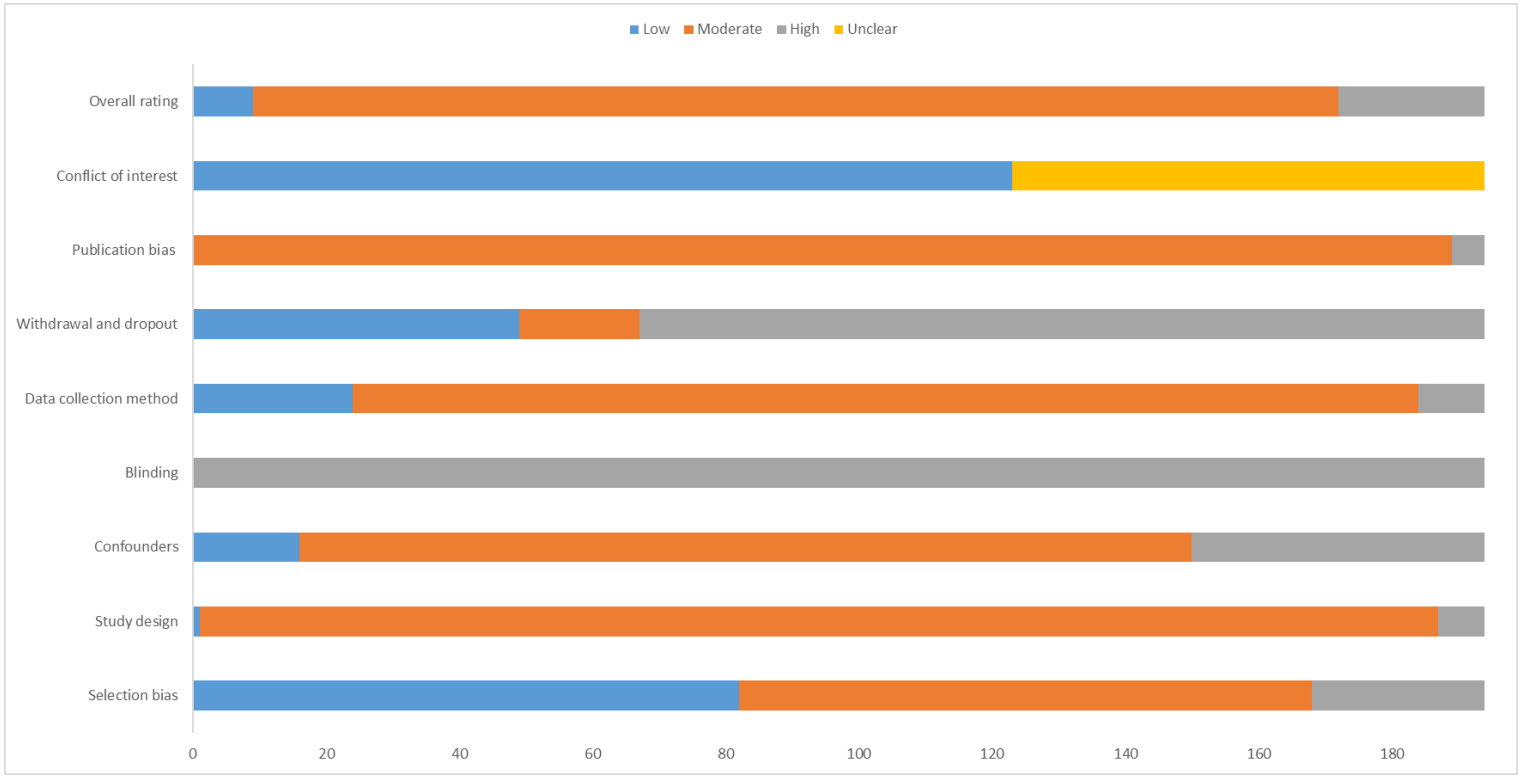
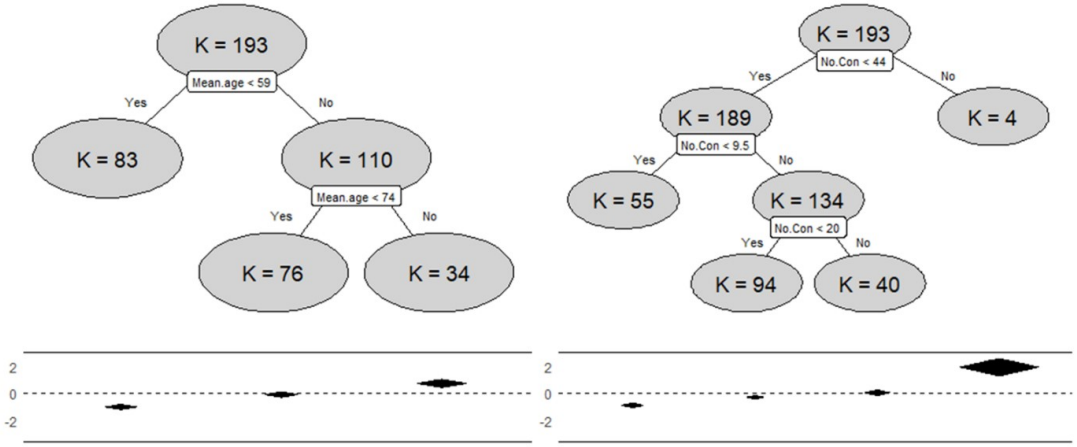


Figure S4: Meta-regression trees for predicting the pooled estimated prevalence of multimorbidity (based on 'mean age' and 'number of conditions' predictors. unit: log(odds))



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