

Table S1 Relevant databases retrieval record.

Source: PubMed		
Search number	Search Details	Results
#13	((("Osteoporosis"[Mesh]) OR (((Osteoporosis[Title/Abstract]) OR (Osteoporoses[Title/Abstract])) OR (Bone Loss*[Title/Abstract]))) OR ((("Fractures, Bone"[Mesh]) OR ((Bone Fracture*[Title/Abstract]) OR (Broken Bone*[Title/Abstract])))) AND ((("Diabetes Mellitus, Type 2"[Mesh]) OR (((((Non-Insulin-Dependent Diabetes Mellitus[Title/Abstract]) OR (NIDDM[Title/Abstract])) OR (Noninsulin Dependent Diabetes Mellitus[Title/Abstract])) OR (Type 2 Diabetes[Title/Abstract])) OR (T2DM[Title/Abstract])))) AND ((((((observational) OR (cohort)) OR (case control)) OR (cross sectional)) OR (prospective)) OR (retrospective)) OR (follow up))	855
#12	((("Osteoporosis"[Mesh]) OR (((Osteoporosis[Title/Abstract]) OR (Osteoporoses[Title/Abstract])) OR (Bone Loss*[Title/Abstract]))) OR ((("Fractures, Bone"[Mesh]) OR ((Bone Fracture*[Title/Abstract]) OR (Broken Bone*[Title/Abstract])))) AND ((("Diabetes Mellitus, Type 2"[Mesh]) OR (((((Non-Insulin-Dependent Diabetes Mellitus[Title/Abstract]) OR (NIDDM[Title/Abstract])) OR (Noninsulin Dependent Diabetes Mellitus[Title/Abstract])) OR (Type 2 Diabetes[Title/Abstract])) OR (T2DM[Title/Abstract]))	2,429
#11	((("Osteoporosis"[Mesh]) OR (((Osteoporosis[Title/Abstract]) OR (Osteoporoses[Title/Abstract])) OR (Bone Loss*[Title/Abstract]))) OR ((("Fractures, Bone"[Mesh]) OR ((Bone Fracture*[Title/Abstract]) OR (Broken Bone*[Title/Abstract]))	311,593
#10	("Fractures, Bone"[Mesh]) OR ((Bone Fracture*[Title/Abstract]) OR (Broken Bone*[Title/Abstract]))	213,520
#9	("Osteoporosis"[Mesh]) OR (((Osteoporosis[Title/Abstract]) OR (Osteoporoses[Title/Abstract])) OR (Bone Loss*[Title/Abstract]))	123,808
#8	("Diabetes Mellitus, Type 2"[Mesh]) OR (((((Non-Insulin-Dependent Diabetes Mellitus[Title/Abstract]) OR (NIDDM[Title/Abstract])) OR (Noninsulin Dependent Diabetes Mellitus[Title/Abstract])) OR (Type 2 Diabetes[Title/Abstract])) OR (T2DM[Title/Abstract]))	228,316
#7	(((((observational) OR (cohort)) OR (case control)) OR (cross sectional)) OR (prospective)) OR (retrospective)) OR (follow up)	4,484,048
#6	(Bone Fracture*[Title/Abstract]) OR (Broken Bone*[Title/Abstract])	13,374
#5	"Fractures, Bone"[Mesh]	206,759
#4	((Osteoporosis[Title/Abstract]) OR (Osteoporoses[Title/Abstract])) OR (Bone Loss*[Title/Abstract])	108,454
#3	"Osteoporosis"[Mesh]	62,407
#2	((((Non-Insulin-Dependent Diabetes Mellitus[Title/Abstract]) OR (NIDDM[Title/Abstract])) OR (Noninsulin Dependent Diabetes Mellitus[Title/Abstract])) OR (Type 2 Diabetes[Title/Abstract])) OR (T2DM[Title/Abstract])	176,083
#1	"Diabetes Mellitus, Type 2"[Mesh]	168,402

Source: Embase

No.	Query	Results
#13	#7 AND #12	2704
#12	#8 AND #11	7811
#11	#9 OR #10	578996
#10	#5 OR #6	443976
#9	#3 OR #4	204280
#8	#1 OR #2	374342
#7	observational OR cohort OR (case AND control) OR (cross AND sectional) OR prospective OR retrospective OR (follow AND up)	6466986
#6	'broken bone*':ab,ti OR fracture:ab,ti	251294
#5	'fracture'/exp	383978
#4	osteoporoses:ab,ti OR osteoporosis:ab,ti OR 'bone loss*':ab,ti	152196

#3	'osteoporosis'/exp	152280
#2	'non-insulin-dependent diabetes mellitus':ab,ti OR niddm:ab,ti OR 'noninsulin dependent diabetes mellitus':ab,ti OR 'type 2 diabetes':ab,ti OR t2dm:ab,ti	260505
#1	'non insulin dependent diabetes mellitus'/exp	327229

Source: Cochrane Library

ID	Search	Results
#1	MeSH descriptor: [Diabetes Mellitus, Type 2] explode all trees	22903
#2	(Non-Insulin-Dependent Diabetes Mellitus):ti,ab,kw OR (NIDDM):ti,ab,kw OR (Noninsulin Dependent Diabetes Mellitus):ti,ab,kw OR (Type 2 Diabetes):ti,ab,kw OR (T2DM):ti,ab,kw	58683
#3	MeSH descriptor: [Osteoporosis] explode all trees	5754
#4	(Osteoporosis):ti,ab,kw OR (Osteoporoses):ti,ab,kw OR (Bone Loss*):ti,ab,kw	20254
#5	MeSH descriptor: [Fractures, Bone] explode all trees	8166
#6	(Bone Fracture*):ti,ab,kw OR (Broken Bone*):ti,ab,kw	12694
#7	#1OR#2	58684
#8	#3OR#4	20254
#9	#5OR#6	15350
#10	#8OR#9	29640
#11	#7AND#10	585
#12	(observational) OR (cohort) OR (case control) OR (cross sectional) OR (prospective)	375043
#13	(retrospective) OR (follow up)	326698
#14	#12OR#13	592660
#15	#14AND#11	276

Source: Web of science

No.	Query	Results
#88	#83 AND #75 and Preprint Citation Index (Exclude – Database)	2693
#83	#77 AND #62 and Preprint Citation Index (Exclude – Database)	10991
#77	#68 OR #53 and Preprint Citation Index (Exclude – Database)	157545
		2
#75	(((((TS=(observational)) OR TS=(cohort)) OR TS=(case control)) OR TS=(cross sectional)) OR TS=(prospective)) OR TS=(retrospective)) OR TS=(follow up) and Preprint Citation Index (Exclude – Database)	908313
		4
#68	(TS=(Fractures)) OR TS=(Broken Bone*) and Preprint Citation Index (Exclude – Database)	130167
		3
#62	(((((TS=(Non-Insulin-Dependent Diabetes Mellitus)) OR TS=(NIDDM)) OR TS=(Noninsulin Dependent Diabetes Mellitus)) OR TS=(Type 2 Diabetes)) OR TS=(T2DM) and Preprint Citation Index (Exclude – Database)	451695
#53	((TS=(Osteoporosis)) OR TS=(Osteoporoses)) OR TS=(Bone Loss*) and Preprint Citation Index (Exclude – Database)	365698

Table S2 Newcastle-Ottawa Scale (cohort) for eighteen studies included in this meta-analysis.

Study	Selection				Comparability		Outcome		Quality score
	Representativeness of the exposed cohort	Selection of the nonexposed cohort	Ascertainment of exposure	Demonstration that outcome of interest was not present at start of study	Comparability of cohorts on the basis of the design or analysis	Assessment of outcome	Was follow-up long enough for outcomes to occur	Adequacy of follow-up of cohorts	
Wang 2022	1	1	1	0	1	1	1	1	7
van Hulten2022	0	1	1	0	1	1	1	1	6
Sarodnik 2022	1	1	1	0	2	1	1	1	8
Lin2021	1	1	1	1	2	1	1	1	9
Davie2021	1	1	1	0	2	1	1	1	8
AlMonaei 2021	1	1	1	0	1	1	1	1	7
Park 2021	1	1	1	0	2	1	1	1	8
Jiajue2019	1	1	1	0	2	1	1	1	8
Tebé2019	1	1	1	0	1	1	1	1	7
Holm2018	1	1	1	0	2	1	1	1	8
de Waard2016	1	1	1	0	2	1	1	1	8
Rathmann2015	1	1	1	1	2	2	1	1	9
Schneider 2013	1	1	1	0	2	1	1	0	7
Lipscombe 2007	1	1	1	0	2	1	1	1	8
Bonds2006	1	1	1	0	2	1	1	0	7
Strotmeyer 2005	0	1	1	0	2	1	1	0	6
Ottenbacher2002	1	1	1	0	2	1	1	0	7
Nicodemus 2001	0	1	0	0	2	0	1	0	4

Table S3 Newcastle-Ottawa Scale (case-control) for six studies included in this meta-analysis.

Study	Selection		Comparability		Exposure				Overall score
	Is the case definition adequate?	Representativeness of the cases	Selection of controls	Definition of Controls	Comparability of cohorts on the basis of the design or analysis	Ascertainment of exposure	Same method of ascertainment for cases and controls	non-response rate	
Schousboe 2022	1	1	0	1	2	1	1	0	7
Mesinovic 2021	1	1	1	1	2	1	1	0	8
Lee2021	0	1	0	0	2	1	1	1	6
Ha2021	1	1	0	0	2	1	1	1	7
Janghorbani2006	0	1	1	1	2	0	1	0	6
Vestergaard2005	1	1	1	1	2	1	1	0	9

Table S4 Agency for healthcare research and quality (AHRQ) checklist (cross-sectional) for 2 studies included in this meta-analysis.

Study	Define the source of information (survey , record review) 1	List inclusion and exclusion criteria for exposed and unexposed subjects (cases and controls) or refer to previous publications. 2	Indicate the time period used for identifying patients. 3	Indicate whether or not the subjects were consecutive if not population based. 4	Indicate if the evaluators of subjective components of study were masked to other aspects of the status of the participants. 5	Describe any assessments undertaken for quality assurance purposes (e.g., test/retest of primary outcome measurements). 6	Explain any patient exclusions from the analysis. 7	Describe how confounding was assessed and/or controlled 8	If applicable, explain how missing data were handled in the analysis. 9	Summarize the patient response rates and completeness of data collection. 10	Clarify what follow-up, if any, was expected and the percentage of patients for which incomplete data or follow-up was obtained. 11	scores
Liu2019	1	1	1	1	1	1	1	0	1	1	1	10
Kim2017	1	1	1	1	1	1	0	1	1	1	1	10

Fig. S1 Subgroup analysis of osteoporosis by analysis

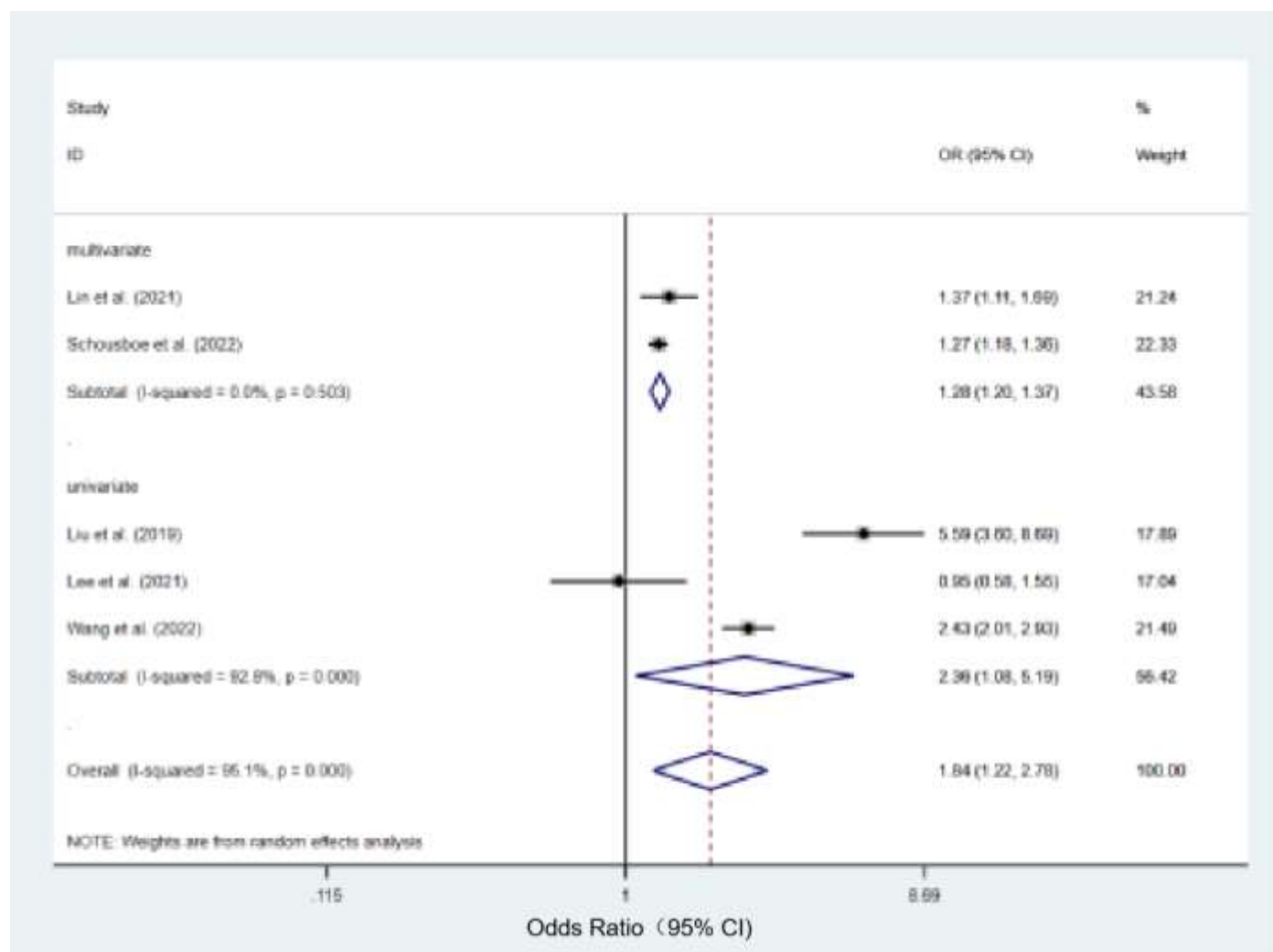


Fig. S2 Subgroup analysis of osteoporosis according to research type

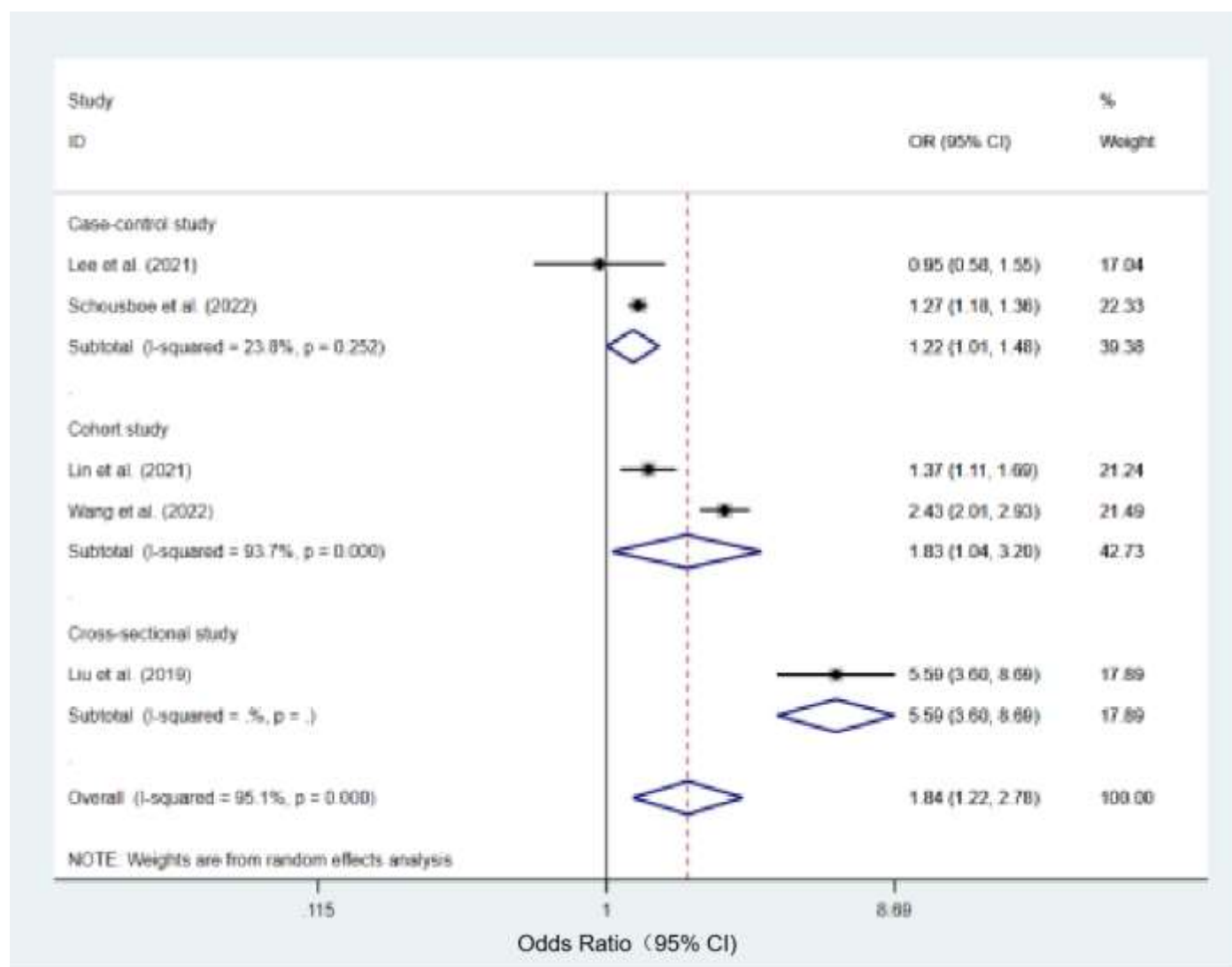


Fig. S3 Subgroup analysis of osteoporosis according to geographical region

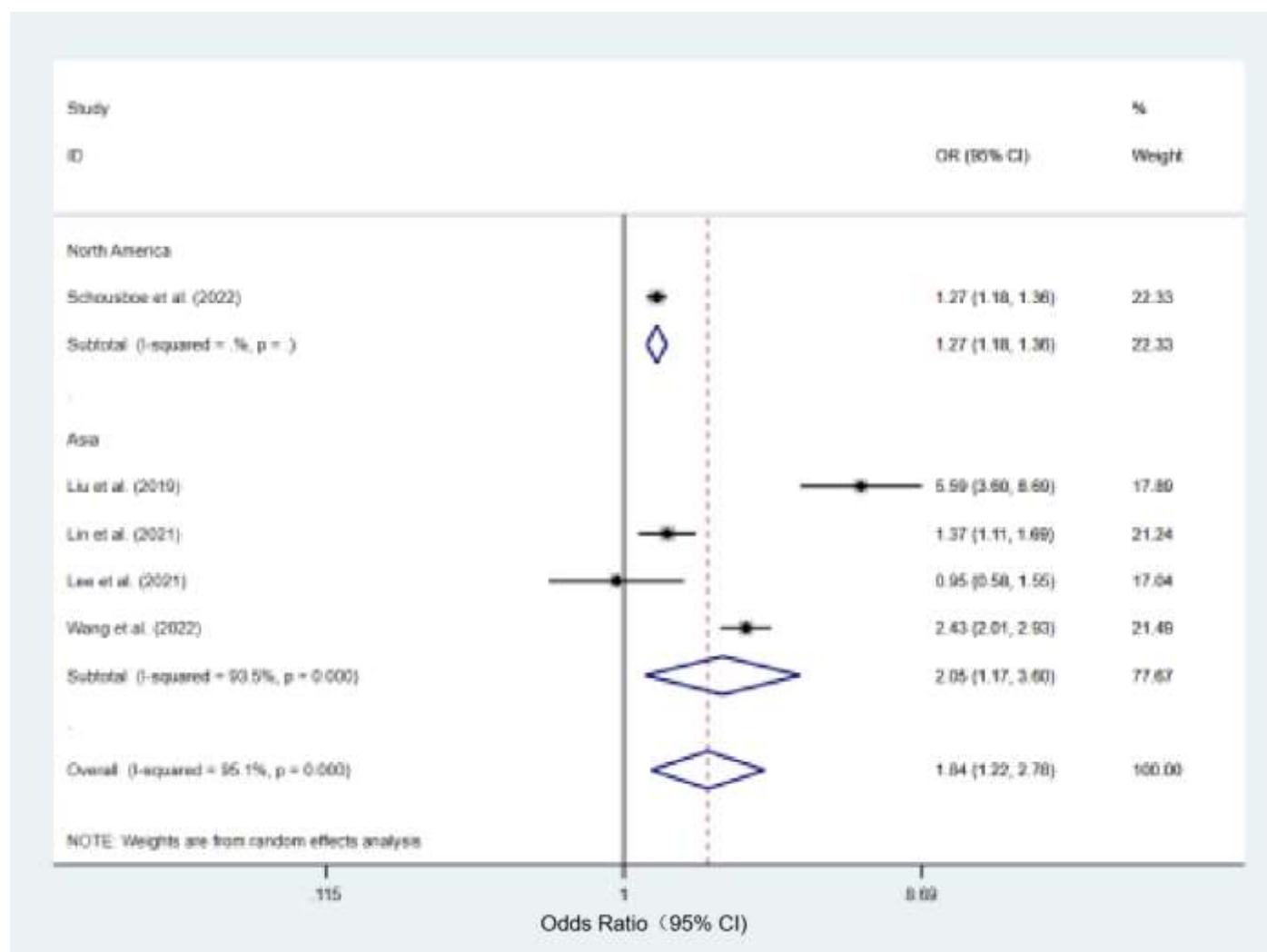


Fig. S4 Subgroup analysis of fractures by means of analysis

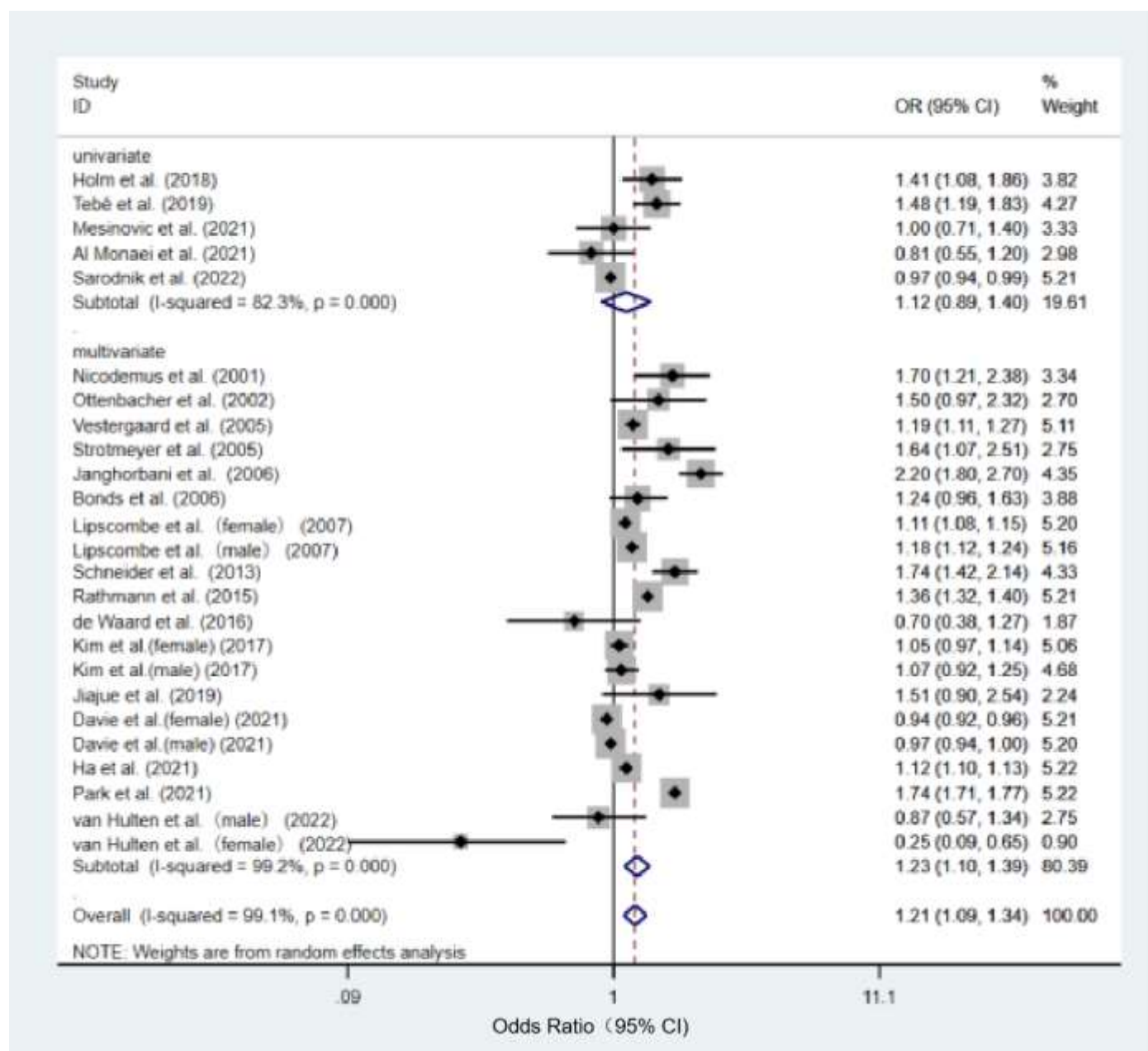


Fig. S5 Subgroup analysis of fractures according to research type.

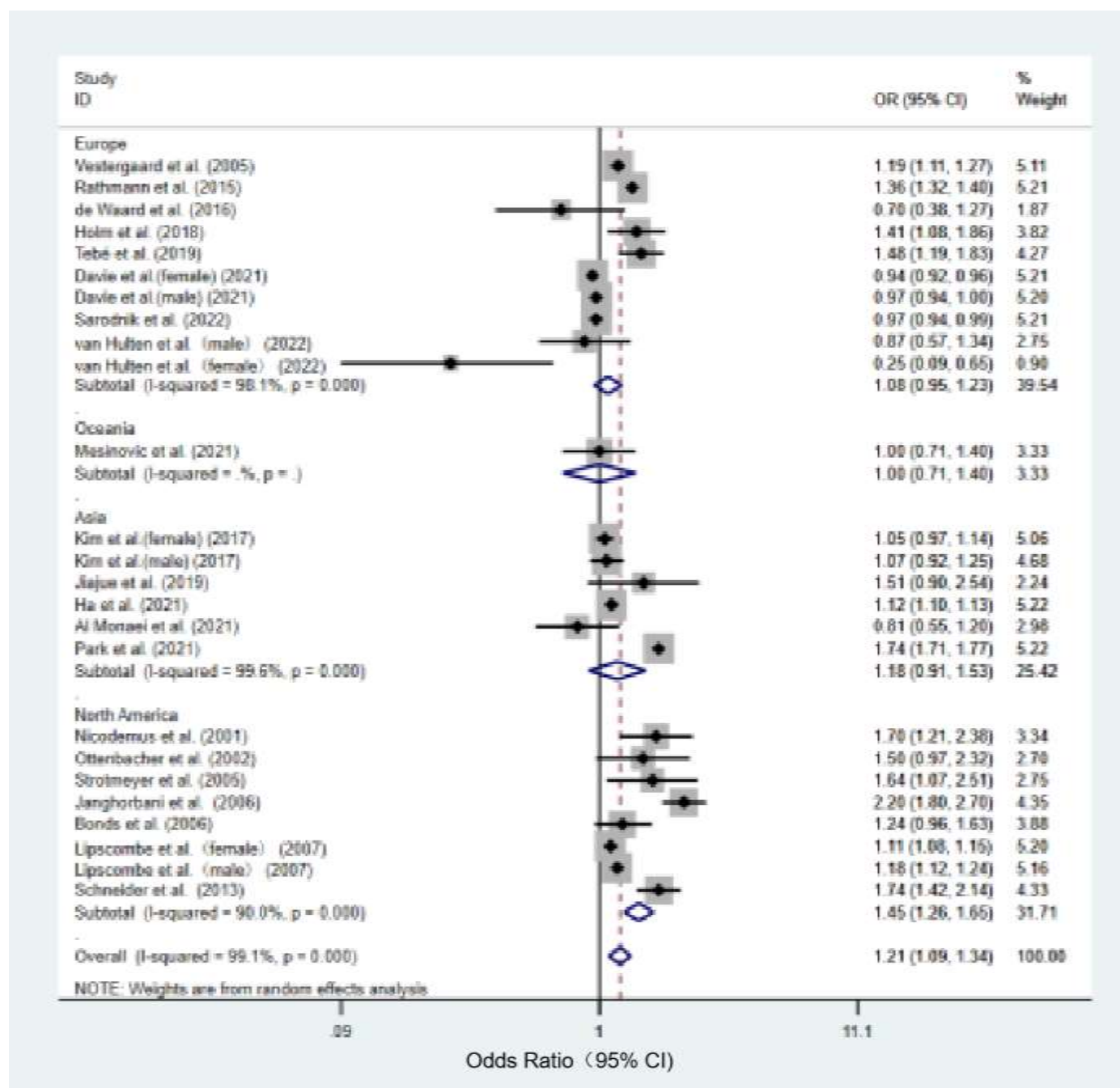


Fig. S6 Subgroup analysis of fractures by geographical region

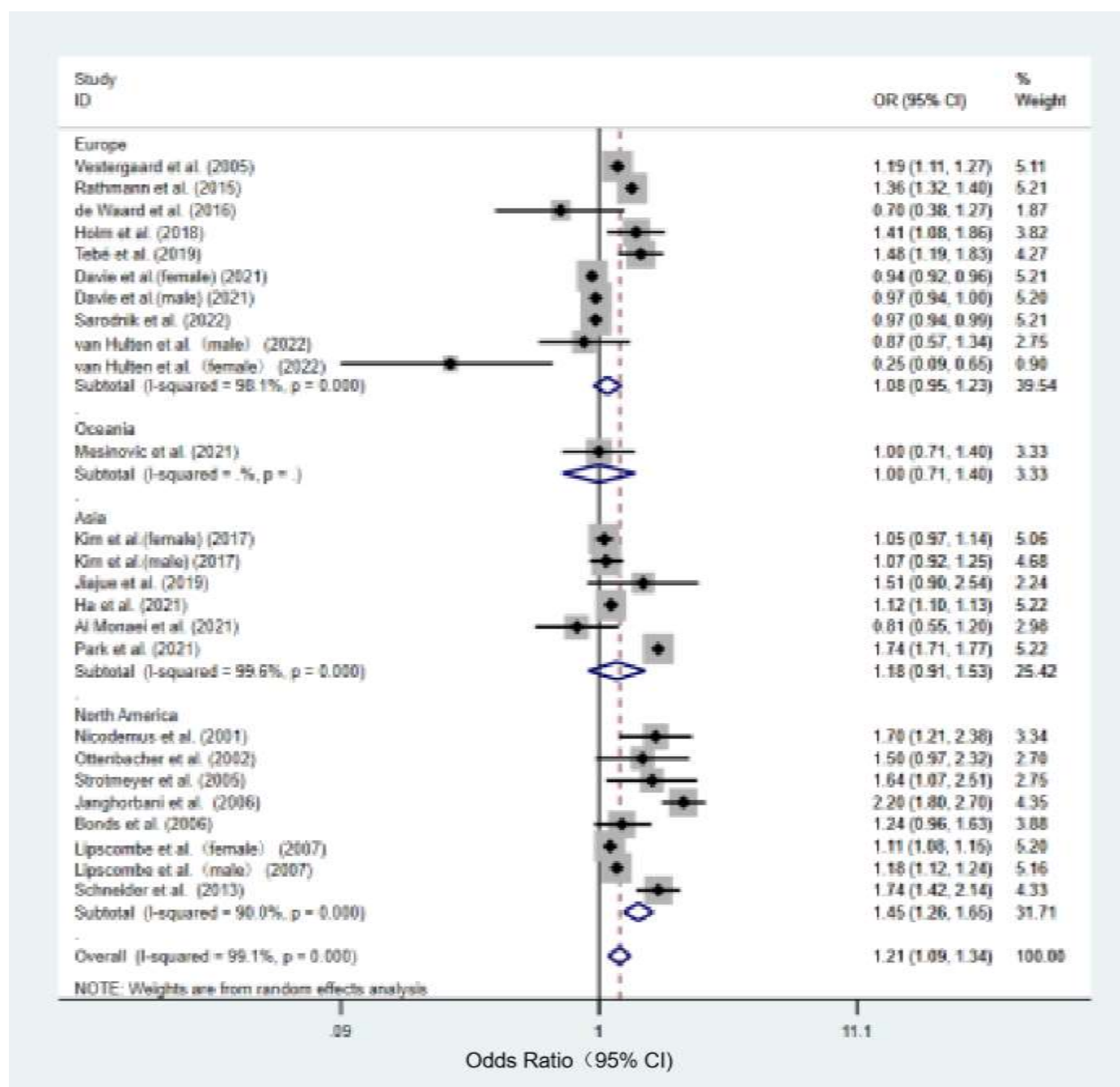


Fig. S7 Subgroup analysis of fracture-by-fracture sites (hip and vertebral fractures).

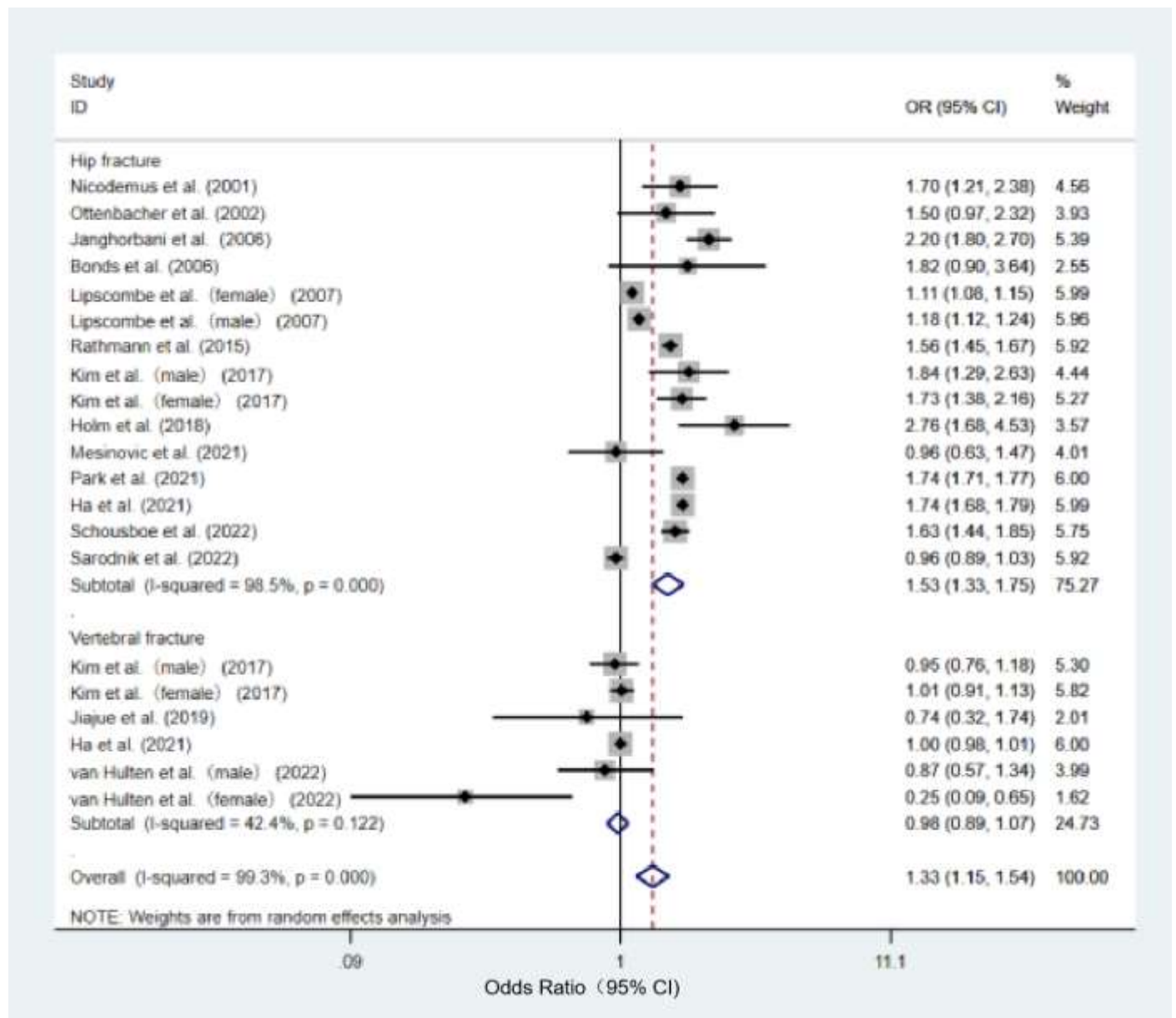


Fig. S8 Subgroup analysis of fractures by sex

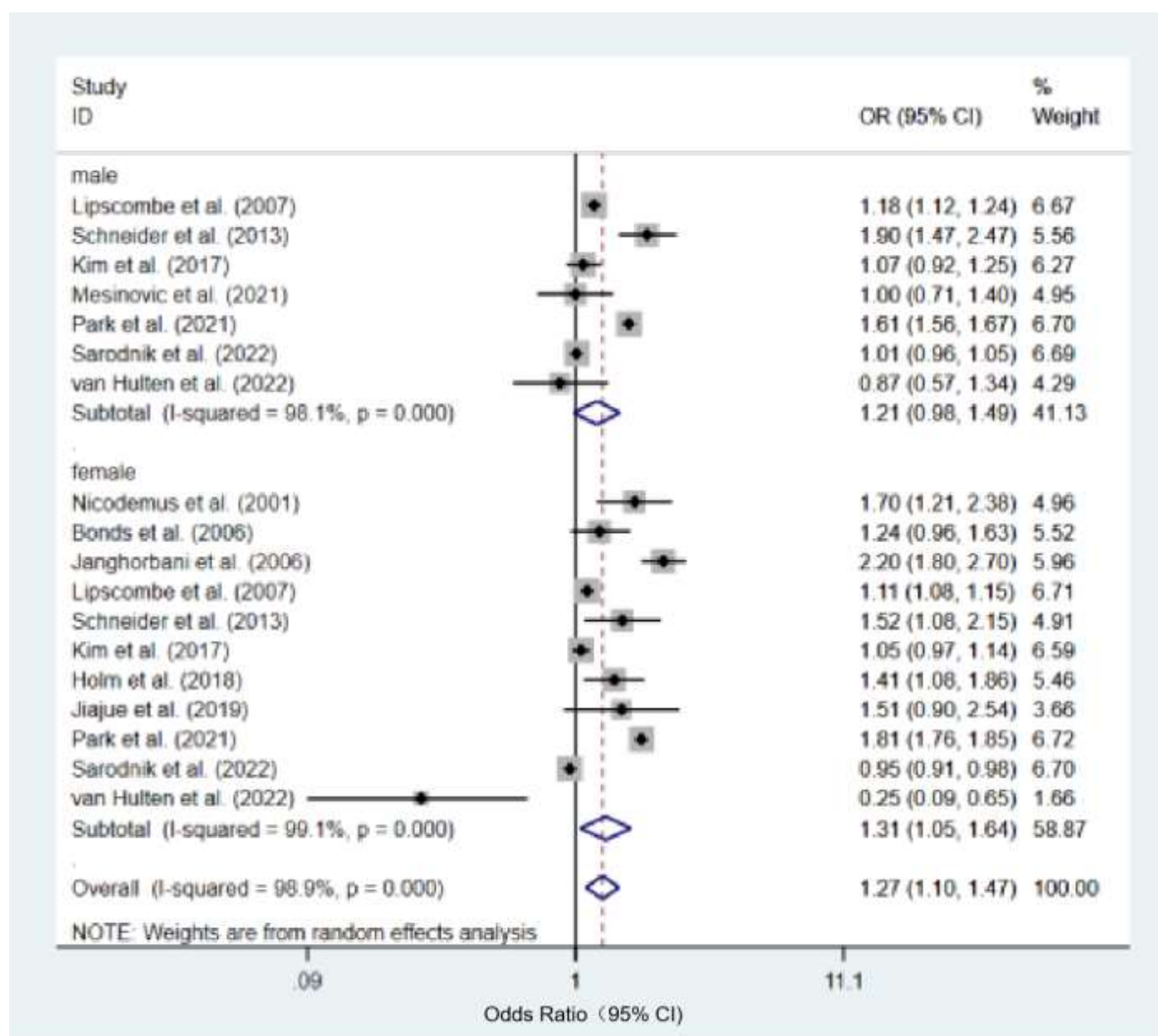


Fig. S9: Sensitivity analysis of osteoporosis.

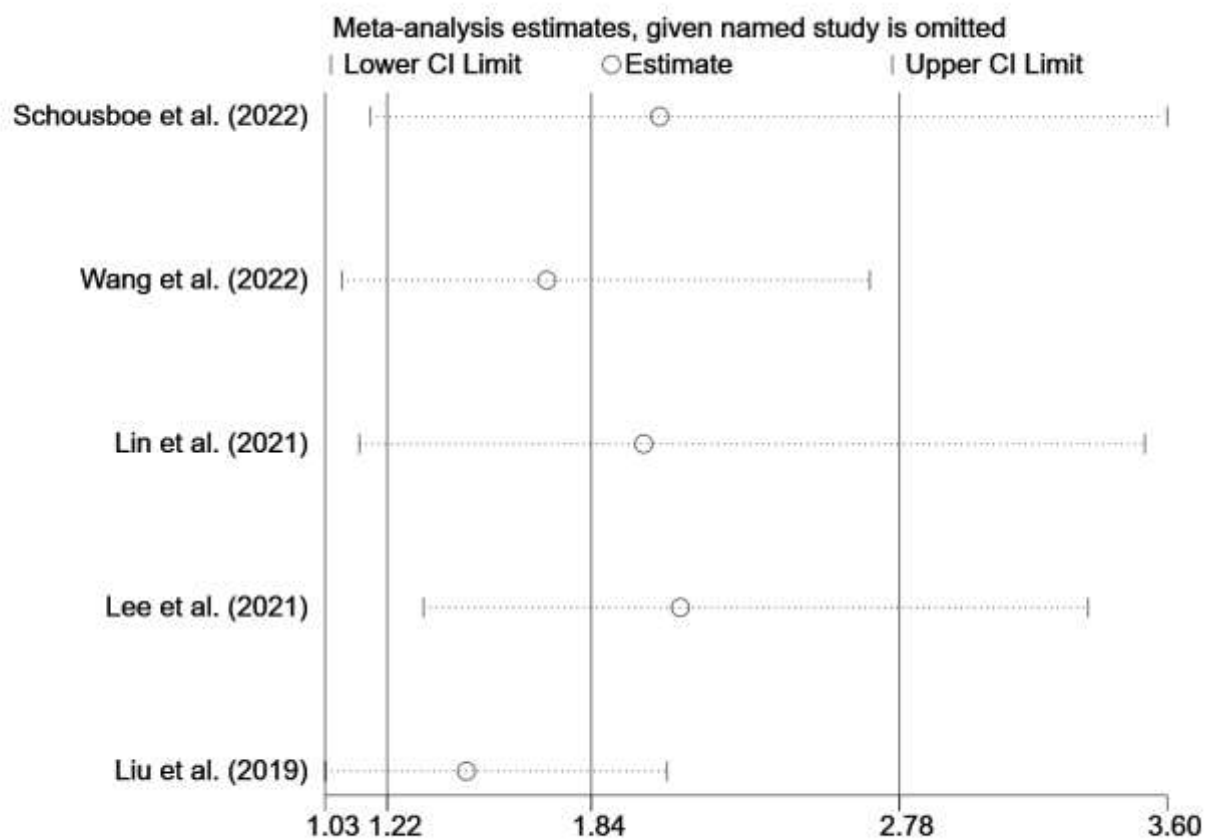


Fig. S10 Sensitivity analysis of fractures

