Supplementary Table S4 - Main characteristics of the studies included in this systematic literature review.

Study	Setting (Country)	Study design and duration of follow-up	Exclusion criteria	Population at baseline (N)	Population available for event verification	% women	Mean age (range)	Number of fractures per site	Fractures ascertainment	AUC
Computer model for osteoporotic fracture risk										
Ettinger (2005) [35]	Gen. Pop. (USA)	Prosp. Cohort 5 yrs	Any described	NA	DM - >400,000 VM-NA	100%	NA (45–79)	Hip, humerus, and wrist-14,528 Hip – 3,412	NA	NA
FRAMO										
Albertsson (2007) [36]	Gen. Pop. (Sweden)	Prosp. Cohort 2 yrs	NA	1,498	1.248	100%	78.8 yrs (70-100)	Hip-31	GP records	Hip-0.72 Mortality-0.75
Albertsson (2010) [37]	Gen. Pop. (Sweden)	Prosp. Cohort 2 yrs	NA	390	285	100%	79 yrs (72-98)	Hip, distal radius, proximal humerus, pubic bone, ischial bone, vertebrae - 14 Hip-7	Radiographic confirmed	NA
FRAX®										
Kanis (2007) [32]*	Differs with cohort (Several countries)	Prosp. Cohort DM-3,2 yrs VM-NA	Differs with cohort	NA	DM-46,340 VM-230,486	DM -68% VM-NA	DM - 65 yrs (20-106) VM - 63 yrs (35-116)	DM MOP -3,360 Hip - 850 VM MOP -15,183 Hip – 3,318	Depends on the study	DM With BMD MOP - 0.62 Hip - 0.74 Without BMD MOP -0.60 Hip – 0.66 VM With BMD MOP: - 0.63 Hip – 0.78 Without BMD MOP -0.62 Hip -0.67
Donaldson (2009) [43]*	Post. Menop. (USA)	RCT 3.8yrs	Use of systemic glucocorticoids	3,223	3,043	100%	68.2yrs (55-81)	MOP - 253 Vertebral only - 223	Self reported and radiographic confirmed. Vertebral frc confirmed by Xray	With BMD MOP-0.71 Without BMD MOP -0.68
Ensrud (2009) [44]*	Gen. Pop. (USA)	Prosp. Cohort MOP-8.7 yrs Hip- 9.2 yrs	Black women. Women unable to walk without assistance or with history of bilateral hip replacement	9,704	6,252	100%	71.3yrs (≥ 65)	MOP-1,037 Hip-389	Self reported and radiographic confirmed	With BMD MOP -0.68 Hip -0.75 Without BMD MOP-0.64

										Hip-0.71
Leslie (2010) [51]*	OP Screen. (Canada)	Prosp. Cohort NA	None	NA	39,603	92.8%	W 65.7yrs M 68.2yrs (≥50)	MOP-2,543 Hip-549	Radiographic confirmed	With BMD MOP -0.69 Hip -0.83 Without BMD MOP-0.66 Hip-0.79
Sornay-Rendu (2010) [56]	Gen. Pop. (France)	Prosp. Cohort 10yrs	Women with diseases or treatment that affect bone metabolism. HRT use in the last 12 months.	867	867	100%	58.8 yrs (≥ 40)	MOP-82 Hip-17	Self-reported and radiographic confirmed	With BMD MOP -0.78 Without BMD MOP -0.75
Tremollieres (2010) [76]*	Post. Menop. (France)	Prosp. Cohort 13.4yrs	Women treated for osteoporosis > 3 months (with the exception of parathyroid hormone and calcium/vitamin D supplementation.	4,024	2,651	100%	54 yrs (≥ 45)	MOP-145 Hip-13	Self-reported and radiographic confirmed	Without BMD MOP -0.63
Fraser (2011) [46]*	Gen. Pop. (Canada)	Prosp. Cohort 10yrs	Any described	NA	6,697	71.3%	W 65.8 yrs M 65.3yrs (≥50)	MOP: W-12%; M-6.4% Hip: W-2.7%; M-2.4%	Self reported and radiographic confirmed	With BMD MOP -0.69 Hip -0.80 Without BMD MOP-0.66 Hip-0.77
Hillier (2011) [49]	Gen. Pop. (USA)	Prosp. Cohort 9.4yrs	Women unable to walk without assistance and with bilateral hip replacements	7,963	6,252	100%	71 yrs (≥ 65)	MOP- 1,011 Hip-368	Self reported and radiographic confirmed	With BMD MOP (Normal- 0.64; Low bone mass-0.61; Osteoporotic-0.61) Hip (Normal- 0.78; Low bone mass-0.70; Osteoporotic-0.62) Without BMD MOP (Normal- 0.62; Low bone mass-0.59; Osteoporotic-0.61) Hip (Normal- 0.79; Low bone mass- 0.66; Osteoporotic-0.63)
Leslie (2011) [50]	OP Screen. (Canada)	Retr. Cohort 5.5yrs	Available on a different source	NA	36,368	93.1%	65.2 yrs (≥ 50)	MOP-2.321	Confirmed at the discharge diagnostics or hospital.	MOP-0.69 to 0.70
Leslie (2011)	OP Screen.	Retr. Cohort	Available on a different source	NA	37,032	100%	NA	MOP-1,748	Confirmed at the	MOP- 0.67 to 0.75

[52]	(Canada)	DM- 5.5 yrs VM- 5.6 yrs					(≥ 45)		discharge diagnostics or hospital.	
Pressman (2011) [53]*	OP Screen. (USA)	Retr. Cohort 6.6 yrs	Women who did not have at least 1 yr of continuous membership both before and after the DXA scan date, those in whom DXA data were not electronically accessible, and those with missing race/ethnicity and those who had filled a prescription for a bisphosphonate in the year before the DXA test.	NA	94,489	100%	NA (50-85)	Hip-1,579	Confirmed at the discharge diagnostics or hospital.	With BMD Hip -0.84 Without BMD Hip-0.83
Tamaki (2011) [58]	Post. Menop. (Japan)	Prosp. Cohort 10 yrs	Women who did not have femoral neck BMD measurements at the baseline survey, and women taking osteoporosis drugs or HRT at the baseline survey	1,040	815	100%	56.7yrs (40-74)	MOP-43 Hip - 4	Self-reported at each follow-up	With BMD MOP -0.69 Hip -0.88 Without BMD MOP-0.67 Hip-0.86
Cheung (2012) [41]*	Post. Menop. (China)	Prosp. Cohort 4.5 yrs	Women with prescribed osteoporosis treatment	NA	2,266	100%	62.1 yrs (40-90)	MOP- 106 Hip-21	Self-reported and radiographic confirmed	With BMD MOP -0.73 Hip -0.88 Without BMD MOP-0.71 Hip-0.89
González-Macías (2012) [48]*	Gen. Pop. (Spain)	Prosp. Cohort Median 36.1 months	Paget's disease, multiple myeloma, bone metastases, renal failure, hypercalcemia, immobilization for >3 months in the preceding year, anatomical anomalies of the right foot interfering with calcaneal ultrasound measurement, therapeutic doses of fluoride for more than 3 months in the past two yrs or for more than 2 yrs at any time in life, a life expectancy of less than 3 yrs, or participation in any other investigational study involving drugs.	5,146	4,453	100%	72.3 yrs (65–100)	MOP- 201 Hip-50	Self-reported and radiographic confirmed	Without BMD MOP-0.62 Hip-0.64
Ettinger (2013) [45]*	Gen. Pop. (USA)	Prosp. Cohort 8.4 yrs	Men who had used a bisphosphonate within 30 days prior to the baseline visit	5,994	4,291	0%	73.6 yrs (≥ 65)	MOP-374 Hip-161	Self-reported and radiographic confirmed	With BMD MOP-0.67 Hip-0.77 Without BMD MOP-0.63 Hip-0.69
Premaor (2013) [62]	Gen. Pop. (USA)	Prosp. Cohort Obese- 9.1 yrs Non-obese- 9.0	Women unable to walk without assistance, with bilateral hip replacements and black women	9,704	6,049	100%	NA (≥ 65)	MOP: Obese- 26.9% Non-obese- 32.7%	Self-reported and radiographic confirmed	No additional information provided by authors

		yrs								
Tebe Cordomi, 2013 [60]*	OP Screen. (Spain)	Retr. Cohort Median-11 yrs	NA	2,086	1,231	100%	56.8 yrs (40-90)	MOP-222 Hip-13	Self-reported	With BMD MOP-0.61
Azagra (2014) [38]	OP Screen. (Spain)	Prosp. Cohort 10 yrs	Women with wrong number for contact, no responders to 3 calls, treated to osteoporosis ate baseline or during follow up (with exception of supplements). Women died during follow up.	3,247	816	100%	56.8 yrs (40-90)	MOP-49 Hip-15	Confirmed at the GP or hospital.	With BMD MOP-0.74 Without BMD MOP- 0.73
Brennan (2014) [40]	OP Screen. (Canada)	Prosp. Cohort 6.2 yrs	NA	NA	51,327	100%	65.9yrs ≥ 50	MOP- 3723 Hip-1027	Confirmed at the discharge diagnostics or hospital	With BMD MOP- Q1- 0.68 Q5-0.71 Hip- Q1- 0.79 Q5-0.87 Without BMD MOP- Q1- 0.65 Q5-0.68 Hip- Q1- 0.76 Q5-0.85
Friis-Holmberg (2014) [47]*	Gen. Pop. (Denmark)	Prosp. Cohort 4.3 yrs	Participants were excluded if height or weight was missing	18,065	12,758	59.2%	56.8 yrs (40-90)	MOP- 395 Hip-54	Recorded on the GP computer	Without BMD MOP- M- 0.63; W-0.68 Hip- M- 0.76; W-0.86
Sund (2014) [57]*	Post. Menop. (Finland)	Prosp. Cohort 10 yrs	Women who experienced a hip fracture before 1994	13,917	11,182	100%	57.3 yrs (52.4-62.7)	Hip-117	Self-reported and radiographic confirmed	With BMD Hip-0.76 Without BMD Hip- 0.65
FRC										
Lo (2011) [63]	OP Screen. (USA)	Retr. Cohort 6.6 yrs	Women who did not have at least 1 yr of continuous membership both before and after the DXA scan date, those in whom DXA data were not electronically accessible, and those with missing race/ethnicity and those who had filled a prescription for a bisphosphonate in the year before the DXA.	120,972	94,489	100%	62.8 yrs (50-85)	Hip-1,579	Confirmed at the discharge diagnostics or hospital	With BMD Hip-0.85 Without BMD Hip- 0.83
Ettinger (2012) [64]	Gen. Pop. (USA)	Prosp. Cohort 9.2 yrs	Men who had used a bisphosphonate within 30 days prior to the baseline visit	5,994	5,893	0%	73.6 yrs (≥ 65)	MOP-335 Hip-156	Self-reported and radiographic confirmed	With BMD MOP-0.70 Hip-0.79 Without BMD MOP-0.66 Hip-0.71
FRISC										
Tanaka (2010) [65]	Post. Menop. (Japan)	Prosp. Cohort DM-5.3 yrs	DM-Women with metabolic bone disease and secondary osteoporosis	2,187	DM-1,787	100%	DM - 63.4 yrs (45-81)	DM MOP- 383	Available on a different source	VM With BMD

		VM- 10 yrs			VM-400		VM - 59.5 yrs (41-77)	Immobilization- 83 VM MOP- 60		MOP- 0.727
FRISC + FRAX®										
Tanaka (2011) [59]	Post. Menop. (Japan)	Prosp. Cohort 5.1 yrs	Women receiving treatment for osteoporosis, and diseases related to secondary osteoporosis	2,010	765	100%	63.3 yrs (NA)	Clinical and morphometric vertebral fractures- 141 Long bone fractures-49	Vertebral fractures were evaluated using radiographs taken at baseline and during the follow-up. No reference to the other types of fractures	Vertebral frt: FRAX® 0.690, FRISC 0.702, Pentosidine+FRISC 0.732. Vertebral frt and long bone frt: FRAX® 0.671, FRISC 0.685
FRISK										
Henry (2006) [66]	Gen. Pop. (Australia)	Cros. Cohort 2.0 yrs	NA	NA	Cases-231 Control-448	100%	Cases-74 yrs Control-72 yrs (≥60)	NA	Radiology reports	NA
Henry (2011) [67]	Gen. Pop. (Australia)	Prosp. Cohort Median-9.6 yrs	NA	600	600	100%	Median-74 yrs (≥50)	MOP-125 Hip-34	Radiology reports	With BMD MOP-0.66 Without BMD MOP-0.62
GARVAN										
Nguyen (2007) [34]	Gen. Pop. (Australia)	Prosp. Cohort Median-13 yrs	NA	3,676	1,768	58%	NA ≥ 60	Hip: W-96, M-31	Radiology reports	DM - With BMD Hip- W-0.85; M - 0.85
Nguyen (2008) [69]*	Gen. Pop. (Australia)	Prosp. Cohort W median 13 yrs; M median 12 yrs	NA	3,676	2,396	56.7%	W 71 yrs M 70 yrs (≥ 60)	MOP: W-426; M-149	Radiology reports	With BMD MOP W- 0.757; M - 0.754
Langsetm (2011) [68]*	Gen. Pop. (Canada)	Prosp. Cohort 8.6 yrs	NA	9,423	5,758	72.1%	68 yrs (55-95)	MOP: W-583; M-116	Self report annually and 78% Radiographic confirmed	With BMD MOP: W0.69; M- 0.70 Hip W-0.80; M- 0.85
GARVAN + FRAX®										
Sandhu (2010) [55]	OP Screen. (Australia)	Retr. Cohort Fct-1.7 yrs No Fct-3.7 yrs	If any prior MOP fracture, any treatment with bone-specific agent for > 30 months, or presence of metabolic bone disorder	530	200	72%	W Fct -73 yrs W No Fct -68 yrs M Fct- 75 yrs M No Fct – 68	MOP FRAX® W-69 MOP FRAX® M-31	Medical records	**FRAX®-US** MOP: W- 0.77;0.54 **FRAX®-UK** MOP: W-0.78; M-0.57 **GARVAN**

							yrs (60-90)			MOP: W-0.84; M-0.76
Bolland (2011) [39]*	Post. Menop. (New Zealand)	Prosp. Cohort 8.8 yrs	Women with major medical conditions, and if they were taking treatment for OP (including HRT or vitamin D supplements in doses > 1000 IU/day and had serum 25(OH)D levels ≥25 nmol/L. Not have a measurement of femoral neck BMD at baseline	1,471	1,422	100%	74.2 yrs (≥ 55)	MOP FRAX®- 16% MOP GARVAN-19.6% Hip- 4%	Self report	**FRAX** With BMD MOP-0.64 Hip-0.70 Without BMD MOP-0.62 Hip-0.69 **GARVAN** With BMD MOP-0.64 Hip-0.67
Sambrook (2011) [54]	Gen. Pop. (10 countries)	Prosp. Cohort 2 yrs	Women were excluded if they were unable to complete the study survey owing to cognitive impairment, language barriers, institutionalization, or illness, aged younger than 60 years, those on antiosteoporotic medication, and those with incomplete data	60,393	19,586	100%	NA (≥ 60)	MOP FRAX®- 468 MOP GARVAN- 538 Hip- 69	Self-reported	**FRAX®:** Without BMD MOP-0.60 Hip-0.65 **GARVAN** Without BMD MOP-0.64 Hip-0.61
QFracture®										
Hippisley-Cox (2009) [33]*	Gen. Pop. (England and Wales)	Prosp. Cohort DM- 7,898,208 person yrs VM- 4,401,261 person yrs	Patients with no previous recorded fracture, temporary residents, and patients with interrupted periods of registration with the practice and patients who did not have a valid Townsend deprivation score.	DM- 2,391,756 VM- 1,294,732	DM- 2,357,895 VM-1,275,917	DM- 50.2% VM- 50.3%	DM - Median W 48 yrs M 46 yrs VM - Median W 49 yrs M 46 yrs (30-85)	DM MOP-32,284 Hip-12,369 VM MOP-18,471 Hip- 7,162	Recorded on the GP computer records	VM MOP: W- 0.79; M-0.69 Hip: W- 0.89; M- 0.86
Collins (2011) [70]*	Gen. Pop. (UK)	Prosp. Cohort Median MOP - 5.98 yrs Hip - 6.03 yrs	Patients with no previously recorded fracture (hip, distal radius, or vertebra), temporary residents, and had no interrupted periods of registration with a practice	2,244,636	2,209,451	50.6%	Median W 48 yrs M 47 yrs (30-85)	MOP-25,208 Hip- 12,188	Recorded on the GP computer records	MOP: W- 0.82; M-0.74 Hip: W-0.89; M-0.86
Updated QFracture® (2012)										
Hippisley-Cox (2012) [71]*	Gen. Pop. (UK)	Prosp. Cohort DM- 23,608,337 person yrs, VM- 11,732,106 person yrs	Any described	NA	DM- 3,142,673 VM- 1,583,373	DM- 50.9% VM- 49.2%	DM - 50 yrs VM - 50 yrs (30-100)	DM MOP- 59,772 Hip-20,028 VM MOP- 28,685 Hip- 9,610	Recorded on the GP computer records	VM MOP: W- 0.79; M- 0.71 Hip: W- 0.89; M- 0.88
QFracture®+FRAX®										
Cummins (2011) [42]*	OP Screen. (UK and	Retr. Cohort NA	Subjects who were receiving treatment for osteoporosis, those on corticosteroids, and	NA	Cases-246 Controls-338	100%	Fct - 68 yrs Ctl – 66 yrs	MOP-246	NA	**FRAX®** Without BMD

	Ireland)		those with a secondary cause of osteoporosis such as malabsorption, chronic liver disease, renal failure, and malignant disease				(50-85)			MOP W- 0.67 HIP W - 0.71 **QFracture®** MOP W 0.67 HIP W- 0.64
Score for estimating the long-term risk of fracture in post menopausal women										
Van Staa (2006) [72]	OP Screen. (UK)	Prosp. Cohort DM-5.8 yrs VM-5.6 yrs	Women with recent use of oral glucocorticoids.	NA	DM- 366,104 VM- 32,728	100%	NA (≥ 50)	MOP-14,011 Clinical vertebral-1,610 Hip-6,453	Recorded on the GP computer records	DM MOP - 0.60 Hip - 0.84 Clinical vertebral - 0.69 VM NA
Simplified fracture risk system										
Leslie (2009) [73]	OP Screen. (Canada)	Retr. Cohort 3.1 yrs	NA	NA	16,205	100%	65 (≥ 50)	NA	NA	No AUC
SOF										
Ahmed (2006) [74]	Gen. Pop. (Norway)	Prosp. Cohort Max-5 yrs	History of previous hip fracture	5,795	1,410	100%	No Hip- 69.5 yrs Hip-70.4 yrs (65-84)	All non-vertebral Fct-170 Hip-49	Hospital codes discharge	No AUC
WHI										
Hundrup (2010) [75]	Post. Menop. (Denmark)	Prosp. Cohort 5 yrs	Premenopausal women with: 50<age<79 yrs; 42<weight <162 kg; 140<height<179 cm. If they had missing items in the questionnaire on smoking status, physical activity and self-reported health.	15,648	13,353	100%	61 yrs (≥ 45)	Hip-122	Recorded on the national register records	Hip-0.82

AUC, Area Under the Curve; CI, Confidence Interval; Cros. Cohort, Cross-sectional Cohort; Ctl, Control; DM, Derivation model; Frt, Fracture; Gen. Pop., General Population; GP – General Practitioner; HRT, Hormone Replacement Therapy; M, Man; MOP, Major Osteoporotic Fracture; NA, Not available; Post. Menop., Post Menopausal; Prosp. Cohort, Prospective Cohort; Retr. Cohort, Retrospective Cohort; OP Screen., Osteoporosis Screening; VM, Validation model; W, Women; yrs, Years

* Included in Meta-analysis