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Analyses of cost-effective BMD scanning and treatment strategies for generic alendronate, risedronate, strontium ranelate, raloxifene and teriparatide following corrections to the methodology associated with lower efficacy in some risk factors.

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Introduction

This report is an addendum to a previous results presented to the committee that estimated the impact of lowering the efficacy of bisphosphonate treatment in fracture risks associated with the following clinical risk factors (glucocorticoids use, rheumatoid arthritis, smoking, alcohol consumption and parental history of hip fracture) – henceforth referred to as Type B clinical risk factors.

In the initial analyses the efficacy in Type B clinical risk factors was lowered however the efficacy in fracture risks relating to age, BMD and prior fracture (henceforth referred to as Type A clinical risk factors) was kept constant at the value reported from the meta-analyses of bisphosphonate RCTs. This was incorrect and an adjustment to the efficacy in Type A clinical risk factors should have been made.

To illustrate this point consider the following hypothetical example. In a trial there are two equally sized cohorts, one of which are given bisphosphonates, and one that is not. 600 fractures are observed in the treatment arm, and 1000 in the placebo arm, resulting in an unadjusted relative risk reduction (RRR) of 40%.

If it were assumed that bisphosphonates had zero efficacy in Type B clinical risk factors, the efficacy in Type A clinical risk factors should be increased. Consider that 200 fractures occur in both arms from Type B clinical risk factors. Thus there were 400 fractures associated with Type A clinical risk factors in the treatment arm, and 800 in the placebo arm. This results in a RRR for fractures associated with Type A clinical risk factors of 50%, and this value should be used if 0% is assumed for Type B clinical risk factors

Whilst the numbers are different in our work, the methodology still holds and has been used alongside the following assumptions.

1) That the proportions of patients with clinical risk factors in the RCTs of bisphosphonates are equal to the proportions observed in the WHO algorithm data set (academic in confidence)
2) That the fracture risk associated with each clinical risk factor is that provided by the WHO algorithm (academic in confidence)

As an indication of the effect of such adjustments we present data for women aged 70-74 years. RCT evidence suggests relative risks (RR) of fracture following bisphosphonate treatment to be 0.71, 0.58, 0.78 and 0.78 at the hip, vertebra, proximal humerus and wrist respectively. Following the required adjustments for the assumption of 0% efficacy in risk factors other than age, BMD and previous fracture status, the RR associated with age, BMD and previous fracture status falls to 0.59, 0.51, 0.74 and 0.74 respectively in women without a prior fracture.

In this report we predominantly focus on generic alendronate, as it has been shown in earlier work to be the most cost-effective first-line treatment option. We evaluate scenarios for BMD scanning and treatment, with sensitivity analyses conducted on the efficacy of bisphosphonates on risk factors other than age, BMD and prior fracture

status, the side-effects of bisphosphonate treatment and the price of generic alendronate.

Further analyses have been undertaken on risedronate, strontium ranelate, raloxifene and teriparatide. These analyses initially look at what identification and treatment strategies are cost-effective, if this drug were used as a first-line treatment option, with supplementary analyses evaluating the T-Score thresholds at which the treatment is cost-effective following a patient withdrawing from generic alendronate.

The full model description has been provided in preceding documents and will not be re-stated, however key variables in the base-case for our analyses, are provided in Table 1.
A key definition that will be re-stated is the distinction between women who need to opportunistically assessed and those that self-identify. Women who self-identify are those that present to a clinician with a clinical risk factor, with no need to find this woman from a multitude of women with the majority having no risk factors. women could self-identify by having a previous fracture, or reporting one to a clinician, being prescribed glucocorticoids, having a diagnosis of rheumatoid arthritis or consulting a GP concerned about osteoporosis.
Women who are opportunistically assessed have not presented to a clinician and resources have to be consumed in order to find whether the woman would be a candidate for BMD scanning or treatment.

The maximum cost per QALY threshold was assumed to be £20,000 per QALY for women who are opportunistically assessed and £30,000 for women who self-identify with a previous fracture.

In our previous analyses where it was assumed that the efficacy from the RCTs were applicable to all clinical risk factors, the results for women who self-identify were the same regardless of the risk factor. With the new methodology allowing different efficacies in Type A and Type B clinical risk factors, the results are dependent on the risk factors that the self-identifying woman has.

If 0% efficacy for Type B clinical risk factors is assumed then the self-identifying results are applicable only to women with a previous fracture. Where 50% efficacy is assumed the self-identifying results will be more favourable to the intervention, when a woman does not have a previous fracture.

The base-case scenario

Table 1: The base-case scenario.

Parameter	Value	Source
Persistence at 5-years	50%	Estimated from the results of the accompanying literature review
The assumed relative risk of bisphosphonates on fracture risks caused by factors other than age, BMD and previous fracture status.	1.00.	Appraisal committee Estimation
The assumed relative risk of bisphosphonates on fracture risks caused age, BMD and previous fracture status	Age dependent, due to the proportion of fractures associated with other risk factors.	Author's calculation based on meta-analysed RCTs and the WHO data-set. (Academic in confidence)
Costs set to HRG values including estimate of home-help costs	Age dependent, see previous report	HRG fracture costs including estimate of home-help costs.
Utility multiplier associated with vertebral fracture.	Year 1 0.792 Year 2+ 0.909	On the request of the appraisal commitee these values were modified from Kanis et al. *Osteoporosis International* 2004; 15 20-26, which was used for all other fracture types. Here the impact of vertebral fracture in year 1 was lessened so that it was equal to that of hip fracture.
Costs incurred over 5-years via side effects associated with bisphosphonate	£4.50 per patient that is compliant (costs for non-compliant patients are included in our analyses)	See earlier text
Utility multiplier associated with bisphosphonate related GI symptoms	0.91 (utility losses for non-compliant patients are included in our analyses)	Groenveld et al [1]
Cost of bisphosphonate	£173 per annum	Price of alendronate.

[1] Groeneveld PW, Lieu TA, Fendrick M, Hurley LB, Ackerson LM, Levin TR and Allison JE. "Quality of life measurements clarifies the cost-effectiveness of Helicobacter Pylori eradication in peptic ulcer disease and uninvestigated dyspepsia" The American Journal of Gastroenterology. 2001 96 (2) 338 - 347

Summarised results for women identified through opportunistic assessment)

	How scenario is different from the base-case.	Identification strategies potentially[2] cost-effective from what age (years)?	Percentage of women age 50 or older that were opportunistically assessed that would be offered a BMD scan (%) [∇]	Percentage of women age 50 or older that were opportunistically assessed that would be treated (%) [∇ψ]
Base-case	-	70	33.8	10.5
1	Side Effects set to 10 times that found in the ScHARR literature review	75	22.2	6.0
2	Price of generic alendronate set to £95	65	47.0	17.0
3	Side Effects set to 10 times that found in the ScHARR literature review and price of generic alendronate set to £95.	70	33.7	10.5
4	Assumption of 50% RCT efficacy on risk factors other than age, BMD and prior fracture status-	70	33.8	6.1
5	**Scenario 4** plus Side Effects set to 10 times that found in the ScHARR literature review	75	33.8	3.8
6	**Scenario 4** plus price of generic alendronate set to £95	65	38.5	13.6
7	**Scenario 4** plus Side Effects set to 10 times that found in the ScHARR literature review and price of generic alendronate set to £95.	70	33.8	8.3

[2] Assuming a cost per QALY of £20,000

Summarised results for self-identifying women

	How scenario is different from the base-case.	Identification strategies potentially[3] cost-effective from what age (years)?	Percentage of women age 50 or older that were opportunistically assessed that would be offered a BMD scan (%) $^{\nabla}$	Percentage of women age 50 or older that were opportunistically assessed that would be treated (%) $^{\nabla\psi}$
Base-case	-	60	71.2	25.0
1	Side Effects set to 10 times that found in the ScHARR literature review	65	59.3	17.6
2	Price of generic alendronate set to £95	55	85.1	34.2
3	Side Effects set to 10 times that found in the ScHARR literature review and price of generic alendronate set to £95.	60	71.2	25.0
4	Assumption of 50% RCT efficacy on risk factors other than age, BMD and prior fracture status-	55	85.1	24.5
5	**Scenario 4** plus Side Effects set to 10 times that found in the ScHARR literature review	55	64.1	17.6
6	**Scenario 4** plus price of generic alendronate set to £95	50	90.0	31.8
7	**Scenario 4** plus Side Effects set to 10 times that found in the ScHARR literature review and price of generic alendronate set to £95.	55	75.4	23.0

[3] Assuming a cost per QALY of £30,000

Detailed results for women found through opportunistic assessment.

Scenario Base-case 1

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
70-74 years	BMD and treat where T-Score <-2.5 SD	£18,581
75 years and over	BMD and treat where T-Score <-2.0 SD	£12,014

Sensitivity Analysis 1-1: Base-case, bar side effects set to 10 times that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
75 years and over	BMD and treat where T-Score <-2.5 SD	£12,484

Sensitivity Analysis 2-1: Base-case, bar price of generic alendronate set to £95 per annum

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
65-69 years	BMD and treat where T-Score <-2.5 SD	£15,549
70-74 years	BMD and treat where T-Score <-2.0 SD	£9,573
75 years and over	BMD and treat where T-Score <-1.0 SD	£5,213

Sensitivity Analysis 3-1: Base-case, bar side effects set to 10 times that reported in the ScHARR literature review and price of generic alendronate set to £95 per annum.

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
70-74 years	BMD and treat where T-Score <-2.5 SD	£14,812
75 years and over	BMD and treat where T-Score <-2.0 SD	£5,832

Sensitivity Analysis 4-1: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£13,036
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	£9,742

Sensitivity Analysis 5-1: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, and side effects to be 10 times the level reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£16,815
75 years and over	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	£9,638

Sensitivity Analysis 6-1: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, and price of generic alendronate set to £95 per annum.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
65-69 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£17,632
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£11,609
75 years and over	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.0 SD	BMD and treat where T-Score <0.5 SD	£6,728

Sensitivity Analysis 7-1: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, side effects to be 10 times the level reported in the ScHARR literature review and price of generic alendronate set to £95 per annum.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	£14,243
75 years and over	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£5,720

Detailed results for self-identifying women.

Scenario Base-case 2

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
60-64 years	BMD and treat where T-Score <-2.5 SD	£23,687
65-69 years	BMD and treat where T-Score <-2.0 SD	£18,457
70-74 years	BMD and treat where T-Score <-1.0 SD	£14,860
75 years and over	BMD and treat where T-Score <-0.5 SD	£8,950

Sensitivity Analysis 1-2: Base-case, bar side effects set to 10 times that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
65-69 years	BMD and treat where T-Score <-2.5 SD	£19,182
70-74 years	BMD and treat where T-Score <-2.0 SD	£12,795
75 years and over	BMD and treat where T-Score <-1.5 SD	£8,255

Sensitivity Analysis 2-2: Base-case, bar price of generic alendronate set to £95 per annum

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
55-59 years	BMD and treat where T-Score <-2.0 SD	£21,995
60-64 years	BMD and treat where T-Score <-1.5 SD	£19,146
65-69 years	BMD and treat where T-Score <-1.0 SD	£14,246
70-74 years	BMD and treat where T-Score < 0.5 SD	£8,107
75 years and over	BMD and treat where T-Score < 1.0 SD	£2,422

Sensitivity Analysis 3-2: Base-case, bar side effects set to 10 times that reported in the ScHARR literature review and price of generic alendronate set to £95 per annum.

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
60-64 years	BMD and treat where T-Score <-2.5 SD	£23,072
65-69 years	BMD and treat where T-Score <-2.0 SD	£12,814
70-74 years	BMD and treat where T-Score <-1.0 SD	£9,135
75 years and over	BMD and treat where T-Score <-0.5 SD	£2,577

Sensitivity Analysis 4-2: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
55-59 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£26,607
60-64 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£23,606
65-70 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	£17,192
70-74 years	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score < 0.0 SD	BMD and treat where T-Score < 0.5 SD	£13,382
75 years and over	BMD and treat where T-Score < -0.5 SD	BMD and treat where T-Score < -0.5 SD	BMD and treat where T-Score < 0.5 SD	BMD and treat where T-Score <1.0 SD	£8,909

Sensitivity Analysis 5-2: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, and side effects to be 10 times the level reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
55-59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£27,284
60-64 years	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£24,579
65-69 years	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£18,641
70-74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£13,237
75 years and over	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-0.5 SD	BMD and treat where T-Score < 0.5 SD	£8,357

Sensitivity Analysis 6-2: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, and price of generic alendronate set to £95 per annum.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
50-54 years	Do not BMD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	£27,422
55-59 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£22,689
60-64 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£17,242
65-69 years	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score < 0.0 SD	BMD and treat where T-Score < 0.5 SD	£13,966
70-74 years	BMD and treat where T-Score <0.5 SD	BMD and treat where T-Score < 1.0 SD	BMD and treat where T-Score < 1.0 SD	BMD and treat where T-Score < 1.0 SD	£8,143
75 years and over	BMD and treat where T-Score < 1.0 SD	BMD and treat where T-Score < 1.0 SD	BMD and treat where T-Score < 1.0 SD	BMD and treat where T-Score < 1.0 SD	£2,287

Sensitivity Analysis 7-2: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, side effects to be 10 times the level reported in the ScHARR literature review and price of generic alendronate set to £95 per annum.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
55-59 years	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£26,186
60-64 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£22,773
65-70 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	£11,760
70-74 years	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score < -0.5 SD	BMD and treat where T-Score < 0.5 SD	£7,438
75 years and over	BMD and treat where T-Score < -1.0 SD	BMD and treat where T-Score < -0.5 SD	BMD and treat where T-Score < 0.5 SD	BMD and treat where T-Score <1.0 SD	£1,824

Comment on the use of DXA scanning in elderly patients with clinical risk factors.

This report has given the T-Score thresholds at which treatment with bisphosphonate becomes cost-effective.

What has not bene considered is the use of treatment without DXA scanning. However it is noted that this may be applicable when it is highly likely that a woman would be at the T-Score threshold or lower, when the patient is elderly and when there is a shortage of DXA machines.

For example in base case 2 (page 10) women aged 75 years and only would need a T-Score of –0.5SD or lower to receive treatment. The average T-Score for women of this age is –1.94SD [4] and thus a decision may be made to treat without DXA. These decisions have not been evaluated in this report.

[4] Stevenson MD, Lloyd-Jones M, De Negris E, Brewer N, Davis S, Oakley J. *A systematic review and economic evaluation of interventions for the Prevention and Treatment of Postmenopausal Osteoporosis*. Health Technol Assess. 2005 (9) 22 pp 1 -160

Identification and treatment strategies that are cost-effective for first-line treatments other than generic alendronate.

The base-case scenario for generic alendronate has also been used for all other drugs. This assumes that the side-effect profile for all drugs are similar, and the results would change if this assumption is incorrect.

For each drug, 4 scenarios have been run, the base-case, the base-case with side-effects set to 10 times that reported in the ScHARR literature review, the base-case assuming that there is 50% efficacy in Type B clinical risk factors, and the base-case assuming that there is 50% efficacy in Type B clinical risk factors with side-effects set to 10 times that reported in the ScHARR literature review.

These are analysed for both women who are opportunistically assessed and for those who self-identify.

Risedronate (opportunistically assessed women)

Scenario Base-case 3

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
75 years and over	BMD and treat where T-Score <-3.0 SD	£14,612

Sensitivity Analysis 1-3: Base-case, bar side effects set to 10 times that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
75 years and over	BMD and treat where T-Score <-3.0 SD	£17,872

Sensitivity Analysis 2-3: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70-74 years	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£19,072
75 years and over	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	£13,717

Sensitivity Analysis 3-3: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, and side effects to be 10 times the level reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
75 years and over	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-1.5 SD	£9,416

Strontium Ranelate (opportunistically assessed women).

For all scenarios analysed, no identification and treatment algorithms have a cost per QALY of £20,000.

Raloxifene (opportunistically assessed women).

For all scenarios analysed, no identification and treatment algorithms have a cost per QALY of £20,000.

Risedronate (self-identifying women)

Scenario Base-case 4

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
65-69 years	BMD and treat where T-Score <-2.5 SD	£23,199
70-74 years	BMD and treat where T-Score <-2.0 SD	£17,346
75 years and over	BMD and treat where T-Score <-1.5 SD	£13,511

Sensitivity Analysis 1-4: Base-case, bar side effects set to 10 times that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
65-69 years	BMD and treat where T-Score <-3.0 SD	£23,911
70-74 years	BMD and treat where T-Score <-2.5 SD	£16,623
75 years and over	BMD and treat where T-Score <-2.0 SD	£13,096

Sensitivity Analysis 2-4: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
55 – 59 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£27,992
60 – 64 years	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£25,720
65 – 69 years	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	£22,299
70 – 74 years	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score <-0.5 SD	£17,797
75 years and over	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.5 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score < 0.0 SD	£11,484

Sensitivity Analysis 3-4: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, and side effects to be 10 times the level reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
60 – 64 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	£24,408
65 – 69 years	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£19,771
70 – 74 years	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	£17,075
75 years and over	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-1.0 SD	BMD and treat where T-Score < -0.5 SD	£10,217

Strontium Ranelate (self identifying women).

Scenario Base-case 4

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
70-74 years	BMD and treat where T-Score <-3.0 SD	£25,602
75 years and over	BMD and treat where T-Score <-2.5 SD	£21,331

Sensitivity Analysis 1-4: Base-case, bar side effects set to 10 times that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors	Cost Per QALY of strategy
75 years and over	BMD and treat where T-Score <-3.0 SD	£21,267

Sensitivity Analysis 2-4: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
65 – 69 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-3.0 SD	£28,111
70 – 74 years	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score <-2.0 SD	£25,518
75 years and over	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	BMD and treat where T-Score < -1.0 SD	£18,737

Sensitivity Analysis 3-4: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, and side effects to be 10 times the level reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70 – 74 years	Do not BMD	BMD and treat where T-Score <-3.5 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score <-2.0 SD	£22,075
75 years and over	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-3.0 SD	BMD and treat where T-Score <-2.5 SD	BMD and treat where T-Score < -1.5 SD	£21,200

Raloxifene (self-identifying women).

For all scenarios analysed, no identification and treatment algorithms have a cost per QALY of less than £30,000.

Teriparatide (self identifying women).

Scenario Base-case 5

No identification and treatment algorithms have a cost per QALY of less than £30,000.

Sensitivity Analysis 1-5: Base-case, bar side effects set to 10 times that reported in the ScHARR literature review.

No identification and treatment algorithms have a cost per QALY of less than £30,000.

Sensitivity Analysis 2-5: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70 – 74 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-3.5 SD	BMD and treat where T-Score <-3.0 SD	£23,403
75 years and over	Do not BMD	BMD and treat where T-Score <-4.0 SD	BMD and treat where T-Score <-3.5 SD	BMD and treat where T-Score <-3.0 SD	£20,100

Sensitivity Analysis 3-4: Base-case, bar efficacy of bisphosphonate set to 50% for clinical risk factor other than BMD and fracture status, and side effects to be 10 times the level reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors	Cost Per QALY of strategy
70 – 74 years	Do not BMD	Do not BMD	BMD and treat where T-Score <-3.5 SD	BMD and treat where T-Score <-3.0 SD	£23,059
75 years and over	Do not BMD	BMD and treat where T-Score <-4.0 SD	BMD and treat where T-Score <-3.5 SD	BMD and treat where T-Score <-3.0 SD	£21,249

The T-Score thresholds at which other interventions become cost-effective assuming that identification costs have been borne by generic alendronate which is prescribed as a first-line treatment.

In this analyses we look at the identification and treatment strategies at which generic alendronate is cost-effective and look at the T-Score thresholds for the remaining interventions, which could be prescribed should a patient become intolerant of generic alendronate.
Analyses are done separately for each drug for women who are opportunistically assessed and those that self identify. As we are uncertain of the price of generic alendronate, results are presented for an assumed cost of £95 with shading indicating that strategies are not cost-effective were the cost of generic alendronate to be £173.

1) **Risedronate (opportunistically assessed women)**

Base-case

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
65-69 years	T-Score <-3.5 SD
70-74 years	T-Score <-3.0 SD
75 years and over	T-Score <-3.0 SD

Base-case with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
70-74 years	T-Score <-3.5 SD
75 years and over	T-Score <-3.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50%.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
65-69 years	N/A	T-Score <-3.5 SD	T-Score <-3.0 SD	T-Score <-3.0 SD
70-74 years	T-Score <-3.5 SD	T-Score <-3.0 SD	T-Score <-2.5 SD	T-Score <-2.0 SD
75 years and over	T-Score <-3.0 SD	T-Score <-3.0 SD	T-Score <-2.0 SD	T-Score <-1.5 SD

Base-case with efficacy of Type B clinical risk factors set to 50% with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
70-74 years	T-Score <-3.5 SD	T-Score <-3.5 SD	T-Score <-3.0 SD	T-Score <-2.5 SD
75 years and over	T-Score <-3.5 SD	T-Score <-3.0 SD	T-Score <-2.5 SD	T-Score <-1.5 SD

2) Strontium Ranelate (opportunistically assessed women)

Base-case

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
65-69 years	T-Score <-4.5 SD
70-74 years	T-Score <-4.0 SD
75 years and over	T-Score <-4.0 SD

Base-case with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
70-74 years	T-Score <-4.5 SD
75 years and over	T-Score <-4.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50%.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
65-69 years	N/A	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-3.5 SD
70-74 years	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.0 SD
75 years and over	T-Score <-4.0 SD	T-Score <-4.0 SD	T-Score <-3.0 SD	T-Score <-2.5 SD

Base-case with efficacy of Type B clinical risk factors set to 50% with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
70-74 years	T-Score <-4.5 SD	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-3.0 SD
75 years and over	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-2.5 SD

3) Raloxifene (opportunistically assessed women)

Base-case

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
65-69 years	Not cost-effective at a T-Score of-5.0 SD
70-74 years	Not cost-effective at a T-Score of-5.0 SD
75 years and over	Not cost-effective at a T-Score of-5.0 SD

Base-case with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
70-74 years	Not cost-effective at a T-Score of-5.0 SD
75 years and over	Not cost-effective at a T-Score of-5.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50%.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
65-69 years	N/A	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD
70-74 years	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD
75 years and over	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50% with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
70-74 years	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD
75 years and over	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD	Not cost-effective at a T-Score of-5.0 SD

4) Risedronate (self-identified women)

Base-case

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
55-59 years	T-Score <-3.0 SD
60-64 years	T-Score <-3.0 SD
65-69 years	T-Score <-2.5 SD
70-74 years	T-Score <-2.0 SD
75 years and over	T-Score <-1.5 SD

Base-case with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
60-64 years	T-Score <-3.0 SD
65-69 years	T-Score <-3.0 SD
70-74 years	T-Score <-2.5 SD
75 years and over	T-Score <-2.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50%.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
50-54 years	N/A	T-Score <-3.0 SD	T-Score <-2.5 SD	T-Score <-2.0 SD
55-59 years	T-Score <-3.0 SD	T-Score <-3.0 SD	T-Score <-2.5 SD	T-Score <-2.0 SD
60-64 years	T-Score <-3.0 SD	T-Score <-3.0 SD	T-Score <-2.5 SD	T-Score <-2.0 SD
65-69 years	T-Score <-3.0 SD N/A	T-Score <-2.5 SD	T-Score <-2.0 SD	T-Score <-1.5 SD
70-74 years	T-Score <-2.0 SD	T-Score <-2.0 SD	T-Score <-1.0 SD	T-Score <-0.5 SD
75 years and over	T-Score <-2.0 SD	T-Score <-1.5 SD	T-Score <-0.5 SD	T-Score < 0.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50% with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
55-59 years	N/A	T-Score <-3.0 SD	T-Score <-3.0 SD	T-Score <-2.5 SD
60-64 years	T-Score <-3.5 SD	T-Score <-3.0 SD	T-Score <-3.0 SD	T-Score <-2.5 SD
65-69 years	T-Score <-3.0 SD	T-Score <-3.0 SD	T-Score <-2.5 SD	T-Score <-2.0 SD
70-74 years	T-Score <-2.5 SD	T-Score <-2.5 SD	T-Score <-2.0 SD	T-Score <-1.0 SD
75 years and over	T-Score <-2.5 SD	T-Score <-2.0 SD	T-Score <-1.0 SD	T-Score <-0.5 SD

5) Strontium Ranelate (self-identified women)

Base-case

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
55-59 years	T-Score <-4.0 SD
60-64 years	T-Score <-3.5 SD
65-69 years	T-Score <-3.5 SD
70-74 years	T-Score <-3.0 SD
75 years and over	T-Score <-2.5 SD

Base-case with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
60-64 years	T-Score <-4.0 SD
65-69 years	T-Score <-4.0 SD
70-74 years	T-Score <-3.5 SD
75 years and over	T-Score <-3.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50%.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
50-54 years	N/A	T-Score <-3.5 SD	T-Score <-3.5 SD	T-Score <-3.0 SD
55-59 years	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.5 SD	T-Score <-3.0 SD
60-64 years	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.5 SD	T-Score <-3.0 SD
65-69 years	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.0 SD	T-Score <-3.0 SD
70-74 years	T-Score <-3.0 SD	T-Score <-3.0 SD	T-Score <-2.0 SD	T-Score <-2.0 SD
75 years and over	T-Score <-3.0 SD	T-Score <-2.5 SD	T-Score <-2.0 SD	T-Score <-1.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50% with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
55-59 years	N/A	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.0 SD
60-64 years	T-Score <-4.0 SD	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.0 SD
65-69 years	T-Score <-4.0 SD	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.0 SD
70-74 years	T-Score <-3.5 SD	T-Score <-3.5 SD	T-Score <-2.5 SD	T-Score <-2.5 SD
75 years and over	T-Score <-3.0 SD	T-Score <-3.0 SD	T-Score <-2.5 SD	T-Score <-1.5 SD

6) Raloxifene (self-identified women)

Base-case

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
55-59 years	Not cost-effective at a T-Score of -5.0 SD
60-64 years	Not cost-effective at a T-Score of -5.0 SD
65-69 years	Not cost-effective at a T-Score of -5.0 SD
70-74 years	T-Score <-4.5 SD
75 years and over	T-Score <-4.0 SD

Base-case with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
60-64 years	Not cost-effective at a T-Score of -5.0 SD
65-69 years	Not cost-effective at a T-Score of -5.0 SD
70-74 years	Not cost-effective at a T-Score of -5.0 SD
75 years and over	T-Score <-5.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50%.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
50-54 years	N/A	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD
55-59 years	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD
60-64 years	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD
65-69 years	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	T-Score <-5.0 SD
70-74 years	T-Score <-5.0 SD	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-3.5 SD
75 years and over	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50% with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
55-59 years	N/A	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD
60-64 years	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD
65-69 years	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	Not cost-effective at a T-Score of -5.0 SD	T-Score <-5.0 SD
70-74 years	Not cost-effective at a T-Score of -5.0 SD	T-Score <-5.0 SD	T-Score <-4.5 SD	T-Score <-4.0 SD
75 years and over	T-Score <-5.0 SD	T-Score <-5.0 SD	T-Score <-4.5 SD	T-Score <-4.0 SD

7) Teriparatide (self-identified women)

Base-case

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
55-59 years	T-Score <-4.5 SD
60-64 years	T-Score <-4.5 SD
65-69 years	T-Score <-5.0 SD
70-74 years	T-Score <-4.5 SD
75 years and over	T-Score <-4.0 SD

Base-case with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	Regardless of number of clinical risk factors, treatment can be cost-effective if the woman has a T-Score known to be
60-64 years	T-Score <-4.5 SD
65-69 years	T-Score <-5.0 SD
70-74 years	T-Score <-4.5 SD
75 years and over	T-Score <-4.5 SD

Base-case with efficacy of Type B clinical risk factors set to 50%.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
50-54 years	N/A	T-Score <-4.0 SD	T-Score <-4.0 SD	T-Score <-3.5 SD
55-59 years	T-Score <-4.5 SD	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-4.0 SD
60-64 years	T-Score <-4.5 SD	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-4.0 SD
65-69 years	T-Score <5.0 SD	T-Score <-4.5 SD	T-Score <-4.5 SD	T-Score <-4.0 SD
70-74 years	T-Score <-4.5 SD	T-Score <-4.5 SD	T-Score <-3.5 SD	T-Score <-3.0 SD
75 years and over	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.0 SD

Base-case with efficacy of Type B clinical risk factors set to 50% with side effects 10 times greater than that reported in the ScHARR literature review.

Age (years)	0 Clinical Risk Factors	1 Clinical Risk Factor	2 Clinical Risk Factors	3 Clinical Risk Factors
55-59 years	N/A	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-4.0 SD
60-64 years	T-Score <-4.5 SD	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-4.0 SD
65-69 years	T-Score <5.0 SD	T-Score <-4.5 SD	T-Score <-4.5 SD	T-Score <-4.0 SD
70-74 years	T-Score <-4.5 SD	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-3.5 SD
75 years and over	T-Score <-4.5 SD	T-Score <-4.0 SD	T-Score <-3.5 SD	T-Score <-3.0 SD