### Supplementary documents

**S1: Patterns of missing values created by participant loss**

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Missing values</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
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<td>0</td>
<td>2779</td>
</tr>
<tr>
<td>+ + + -</td>
<td>1</td>
<td>593</td>
</tr>
<tr>
<td>+ + - -</td>
<td>2</td>
<td>192</td>
</tr>
<tr>
<td>+ - - -</td>
<td>3</td>
<td>191</td>
</tr>
<tr>
<td>- - - -</td>
<td>4</td>
<td>223</td>
</tr>
<tr>
<td>+ + - +</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>- + + +</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

+ present; - absent

**S2: Multivariable regression analyses: all-cause, non-death and death attrition to account for missing data**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>All-cause attrition</th>
<th></th>
<th>Non-death attrition</th>
<th></th>
<th>Death attrition</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR (95% CI) p-value</td>
<td></td>
<td>HR (95% CI) p-value</td>
<td></td>
<td>HR (95% CI) p-value</td>
<td></td>
</tr>
<tr>
<td>Age*</td>
<td>1.20 (1.16 – 1.24)</td>
<td>&lt;0.001</td>
<td>1.19 (1.13 – 1.26)</td>
<td>&lt;0.001</td>
<td>1.61 (1.42 – 1.81)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Education ≥ High school</td>
<td>0.80 (0.69 – 0.92)</td>
<td>0.003</td>
<td>0.74 (0.59 – 0.93)</td>
<td>0.009</td>
<td>0.91 (0.62 – 1.33)</td>
<td>0.613</td>
</tr>
<tr>
<td>Race White</td>
<td>1.00 (0.80 – 1.25)</td>
<td>0.999</td>
<td>0.84 (0.62 – 1.14)</td>
<td>0.266</td>
<td>1.32 (0.69 – 2.52)</td>
<td>0.397</td>
</tr>
<tr>
<td>Body mass index*</td>
<td>0.98 (0.93 – 1.03)</td>
<td>0.366</td>
<td>0.98 (0.91 – 1.05)</td>
<td>0.564</td>
<td>0.96 (0.82 – 1.14)</td>
<td>0.663</td>
</tr>
<tr>
<td>Falls Yes</td>
<td>1.06 (0.94 – 1.20)</td>
<td>0.324</td>
<td>0.98 (0.83 – 1.14)</td>
<td>0.773</td>
<td>1.22 (0.92 – 1.61)</td>
<td>0.165</td>
</tr>
<tr>
<td>Prior fracture Yes</td>
<td>1.02 (0.90 – 1.15)</td>
<td>0.803</td>
<td>1.00 (0.84 – 1.18)</td>
<td>0.958</td>
<td>1.22 (0.88 – 1.71)</td>
<td>0.233</td>
</tr>
<tr>
<td>Osteoporosis Yes</td>
<td>1.02 (0.89 – 1.15)</td>
<td>0.815</td>
<td>0.96 (0.79 – 1.17)</td>
<td>0.695</td>
<td>1.10 (0.75 – 1.63)</td>
<td>0.625</td>
</tr>
<tr>
<td>Polypharmacy Yes</td>
<td>0.81 (0.64 – 1.02)</td>
<td>0.073</td>
<td>0.78 (0.58 – 1.06)</td>
<td>0.115</td>
<td>0.95 (0.60 – 1.51)</td>
<td>0.823</td>
</tr>
<tr>
<td>Smoking Yes</td>
<td>1.65 (1.45 – 1.89)</td>
<td>&lt;0.001</td>
<td>1.77 (1.42 – 2.22)</td>
<td>&lt;0.001</td>
<td>1.98 (1.27 – 3.11)</td>
<td>0.003</td>
</tr>
<tr>
<td>Alcohol intake Yes</td>
<td>1.09 (0.94 – 1.28)</td>
<td>0.255</td>
<td>1.17 (0.94 – 1.45)</td>
<td>0.168</td>
<td>1.21 (0.78 – 1.88)</td>
<td>0.391</td>
</tr>
<tr>
<td>Hospitalization Yes</td>
<td>1.23 (1.05 – 1.43)</td>
<td>0.010</td>
<td>1.42 (1.16 – 1.73)</td>
<td>0.001</td>
<td>1.28 (0.79 – 2.09)</td>
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<tr>
<td>EQ5D5L</td>
<td>0.61 (0.44 – 0.84)</td>
<td>0.003</td>
<td>0.50 (0.34 – 0.72)</td>
<td>&lt;0.001</td>
<td>0.58 (0.26 – 1.27)</td>
<td>0.172</td>
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<tr>
<td>Frailty status Prefrail</td>
<td>1.33 (1.15 – 1.54)</td>
<td>&lt;0.001</td>
<td>1.31 (1.07 – 1.61)</td>
<td>0.010</td>
<td>1.54 (0.94 – 2.53)</td>
<td>0.089</td>
</tr>
<tr>
<td>Frail</td>
<td>1.74 (1.44 – 2.10)</td>
<td>&lt;0.001</td>
<td>1.60 (1.26 – 2.05)</td>
<td>&lt;0.001</td>
<td>3.29 (1.82 – 5.95)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

HR, hazard ratio; CI, confidence interval; EQ5D5L, measure for health-related quality of life; *expressed as change per 5-unit increase

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### S3: Multivariable regression analyses: preventable and non-preventable attrition to account for missing data

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Preventable attrition</th>
<th>Non-preventable attrition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR (95% CI)</td>
<td>p-value</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>1.19</td>
<td>1.13 – 1.26</td>
</tr>
<tr>
<td>Education ≥ High school</td>
<td>0.74</td>
<td>0.59 – 0.93</td>
</tr>
<tr>
<td>Race White</td>
<td>0.84</td>
<td>0.62 – 1.14</td>
</tr>
<tr>
<td>Body mass index*</td>
<td>0.98</td>
<td>0.91 – 1.05</td>
</tr>
<tr>
<td>Falls</td>
<td>1.21</td>
<td>0.96 – 1.53</td>
</tr>
<tr>
<td>Prior fracture Yes</td>
<td>1.00</td>
<td>0.84 – 1.18</td>
</tr>
<tr>
<td>Osteoporosis Yes</td>
<td>0.96</td>
<td>0.79 – 1.17</td>
</tr>
<tr>
<td>Polypharmacy Yes</td>
<td>0.78</td>
<td>0.58 – 1.06</td>
</tr>
<tr>
<td>Smoking Yes</td>
<td>1.77</td>
<td>1.42 – 2.22</td>
</tr>
<tr>
<td>Alcohol intake Yes</td>
<td>1.17</td>
<td>0.94 – 1.45</td>
</tr>
<tr>
<td>Hospitalization Yes</td>
<td>1.42</td>
<td>1.16 – 1.73</td>
</tr>
<tr>
<td>EQ5D5L</td>
<td>0.50</td>
<td>0.34 – 0.72</td>
</tr>
<tr>
<td>Frailty status</td>
<td>1.31</td>
<td>1.07 – 1.61</td>
</tr>
<tr>
<td>Frail</td>
<td>1.60</td>
<td>1.26 – 2.05</td>
</tr>
</tbody>
</table>

HR, hazard ratio; CI, confidence interval; EQ5D5L, measure for health-related quality of life; *expressed as change per 5-unit increase; preventable attrition (attrition due to refusals and loss of contact) non-preventable attrition (attrition due to death and cognitive impairment)
### S4: Multivariable regression analysis for all-cause, non-death and death attrition

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>All-cause attrition</th>
<th>Non-death attrition</th>
<th>Death attrition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR (99% CI) p-value</td>
<td>HR (99% CI) p-value</td>
<td>HR (99% CI) p-value</td>
</tr>
<tr>
<td>Age*</td>
<td>1.19 (1.12–1.25) &lt;0.001</td>
<td>1.22 (1.12–1.34) &lt;0.001</td>
<td>1.59 (1.32–1.91) &lt;0.001</td>
</tr>
<tr>
<td>Education ≥ High school</td>
<td>0.81 (0.67–0.99) 0.006</td>
<td>0.71 (0.54–0.95) 0.003</td>
<td>0.93 (0.52–1.64) 0.729</td>
</tr>
<tr>
<td>Race White</td>
<td>1.19 (0.84–1.69) 0.199</td>
<td>1.08 (0.65–1.79) 0.685</td>
<td>1.69 (0.67–4.27) 0.142</td>
</tr>
<tr>
<td>Body mass index*</td>
<td>0.99 (0.93–1.06) 0.788</td>
<td>0.98 (0.88–1.09) 0.694</td>
<td>0.97 (0.83–1.28) 0.739</td>
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<tr>
<td>Falls Yes</td>
<td>1.06 (0.91–1.24) 0.302</td>
<td>1.07 (0.85–1.33) 0.466</td>
<td>1.21 (0.80–1.84) 0.240</td>
</tr>
<tr>
<td>Prior fracture Yes</td>
<td>1.08 (0.91–1.29) 0.263</td>
<td>1.03 (0.79–1.34) 0.759</td>
<td>1.33 (0.85–2.07) 0.098</td>
</tr>
<tr>
<td>Osteoporosis Yes</td>
<td>1.00 (0.84–1.20) 0.987</td>
<td>0.95 (0.74–1.23) 0.624</td>
<td>1.20 (0.71–2.02) 0.376</td>
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<tr>
<td>Polypharmacy Yes</td>
<td>0.83 (0.59–1.16) 0.149</td>
<td>0.79 (0.52–1.20) 0.151</td>
<td>1.01 (0.53–1.95) 0.954</td>
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<tr>
<td>Smoking Yes</td>
<td>1.69 (1.40–2.04) &lt;0.001</td>
<td>1.74 (1.26–2.42) &lt;0.001</td>
<td>2.29 (1.24–4.22) &lt;0.001</td>
</tr>
<tr>
<td>Alcohol intake Yes</td>
<td>1.06 (0.88–1.28) 0.406</td>
<td>1.12 (0.86–1.45) 0.257</td>
<td>0.98 (0.68–1.62) 0.939</td>
</tr>
<tr>
<td>Hospitalization Yes</td>
<td>1.24 (0.97–1.58) 0.022</td>
<td>1.32 (0.98–1.79) 0.016</td>
<td>1.23 (0.57–2.65) 0.494</td>
</tr>
<tr>
<td>EQ5D5L</td>
<td>0.65 (0.41–1.05) 0.022</td>
<td>0.56 (0.33–0.96) 0.006</td>
<td>0.71 (0.22–2.24) 0.435</td>
</tr>
<tr>
<td>Frailty status Prefrail</td>
<td>1.36 (1.10–1.68) &lt;0.001</td>
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<td>Frail</td>
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<td>1.73 (1.22–2.44) &lt;0.001</td>
<td>3.11 (1.29–7.51) &lt;0.001</td>
</tr>
</tbody>
</table>

HR, hazard ratio; CI, confidence interval; EQ5D5L, measure for health-related quality of life; *expressed as change per 5-unit increase
### S5: Multivariable regression analyses for preventable and non-preventable attrition

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Preventable attrition</th>
<th></th>
<th></th>
<th>Non-preventable attrition</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR (99% CI)</td>
<td>p-value</td>
<td></td>
<td>HR (99% CI)</td>
<td></td>
<td>p-value</td>
</tr>
<tr>
<td>Age*</td>
<td>1.18 (1.07 – 1.29)</td>
<td>&lt;0.001</td>
<td></td>
<td>1.66 (1.43 – 1.92)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.73 (0.54 – 0.99)</td>
<td>0.008</td>
<td></td>
<td>0.82 (0.50 – 1.37)</td>
<td>0.324</td>
<td></td>
</tr>
<tr>
<td>≥ High school</td>
<td>0.98 (0.59 – 1.62)</td>
<td>0.912</td>
<td></td>
<td>2.22 (0.91 – 5.43)</td>
<td>0.022</td>
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</tr>
<tr>
<td>Race</td>
<td>0.99 (0.89 – 1.10)</td>
<td>0.781</td>
<td></td>
<td>1.03 (0.86 – 1.23)</td>
<td>0.655</td>
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<tr>
<td>Body mass index*</td>
<td>1.04 (0.84 – 1.30)</td>
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<td>1.22 (0.90 – 1.66)</td>
<td>0.096</td>
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</tr>
<tr>
<td>Falls</td>
<td>0.99 (0.75 – 1.31)</td>
<td>0.919</td>
<td></td>
<td>1.34 (0.86 – 2.08)</td>
<td>0.092</td>
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<tr>
<td>Prior fracture</td>
<td>0.95 (0.72 – 1.24)</td>
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<td></td>
<td>1.15 (0.73 – 1.81)</td>
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<td>Osteoporosis</td>
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<td>0.90 (0.50 – 1.62)</td>
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<tr>
<td>Polypharmacy</td>
<td>1.79 (1.27 – 2.51)</td>
<td>&lt;0.001</td>
<td></td>
<td>2.07 (1.16 – 3.69)</td>
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<tr>
<td>Polypharmacy</td>
<td>1.16 (0.88 – 1.53)</td>
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<td></td>
<td>0.93 (0.53 – 1.61)</td>
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<tr>
<td>Smoking</td>
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<td></td>
<td>0.98 (0.49 – 1.98)</td>
<td>0.943</td>
<td></td>
</tr>
<tr>
<td>Alcohol intake</td>
<td>0.58 (0.34 – 0.97)</td>
<td>0.006</td>
<td></td>
<td>0.68 (0.24 – 1.85)</td>
<td>0.306</td>
<td></td>
</tr>
<tr>
<td>Hospitalization</td>
<td>1.42 (1.07 – 1.88)</td>
<td>0.001</td>
<td></td>
<td>1.24 (0.70 – 2.18)</td>
<td>0.333</td>
<td></td>
</tr>
<tr>
<td>Frailty status</td>
<td>1.71 (1.21 – 2.40)</td>
<td>&lt;0.001</td>
<td></td>
<td>2.74 (1.34 – 5.57)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>

HR, hazard ratio; CI, confidence interval; EQ5D5L, measure for health-related quality of life; *expressed as change per 5-unit increase; preventable attrition (attrition due to refusals and loss of contact) non-preventable attrition (attrition due to death and cognitive impairment)
### S6: Multivariable regression analyses: all-cause, non-death and death attrition to account for missing data

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>All-cause attrition</th>
<th>Non-death attrition</th>
<th>Death attrition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR (99% CI)</td>
<td>p-value</td>
<td>HR (99% CI)</td>
</tr>
<tr>
<td>Age</td>
<td>1.20 (1.15 – 1.26)</td>
<td>&lt;0.001</td>
<td>1.19 (1.11 – 1.28)</td>
</tr>
<tr>
<td>Education ≥ High school</td>
<td>0.80 (0.66 – 0.97)</td>
<td>0.003</td>
<td>0.74 (0.55 – 1.00)</td>
</tr>
<tr>
<td>Race White</td>
<td>1.00 (0.75 – 1.33)</td>
<td>0.999</td>
<td>0.84 (0.56 – 1.26)</td>
</tr>
<tr>
<td>Body mass index</td>
<td>0.98 (0.91 – 1.05)</td>
<td>0.366</td>
<td>0.98 (0.89 – 1.08)</td>
</tr>
<tr>
<td>Falls Yes</td>
<td>1.06 (0.91 – 1.24)</td>
<td>0.324</td>
<td>0.97 (0.79 – 1.20)</td>
</tr>
<tr>
<td>Prior fracture Yes</td>
<td>1.02 (0.86 – 1.20)</td>
<td>0.803</td>
<td>1.00 (0.79 – 1.25)</td>
</tr>
<tr>
<td>Osteoporosis Yes</td>
<td>1.02 (0.86 – 1.20)</td>
<td>0.815</td>
<td>0.96 (0.74 – 1.25)</td>
</tr>
<tr>
<td>Polypharmacy Yes</td>
<td>0.81 (0.59 – 1.10)</td>
<td>0.073</td>
<td>0.78 (0.53 – 1.17)</td>
</tr>
<tr>
<td>Smoking Yes</td>
<td>1.65 (1.39 – 1.97)</td>
<td>&lt;0.001</td>
<td>1.77 (1.32 – 2.37)</td>
</tr>
<tr>
<td>Alcohol intake Yes</td>
<td>1.09 (0.89 – 1.34)</td>
<td>0.255</td>
<td>1.17 (0.88 – 1.55)</td>
</tr>
<tr>
<td>Hospitalization Yes</td>
<td>1.23 (0.99 – 1.50)</td>
<td>0.010</td>
<td>1.42 (1.09 – 1.84)</td>
</tr>
<tr>
<td>EQ5D5L</td>
<td>0.61 (0.40 – 0.93)</td>
<td>0.003</td>
<td>0.50 (0.31 – 0.81)</td>
</tr>
<tr>
<td>Frailty status Prefail</td>
<td>1.33 (1.10 – 1.61)</td>
<td>&lt;0.001</td>
<td>1.31 (1.00 – 1.72)</td>
</tr>
<tr>
<td>Frail</td>
<td>1.74 (1.36 – 2.22)</td>
<td>&lt;0.001</td>
<td>1.60 (1.16 – 2.21)</td>
</tr>
</tbody>
</table>

HR, hazard ratio; CI, confidence interval; EQ5D5L, measure for health-related quality of life; *expressed as change per 5-unit increase
### S7: Multivariable regression analyses: preventable and non-preventable attrition to account for missing data

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Preventable attrition</th>
<th>Non-preventable attrition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR (99% CI) p-value</td>
<td>HR (99% CI) p-value</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>1.19 1.11 – 1.28 &lt;0.001</td>
<td>1.67 1.45 – 1.89 &lt;0.001</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ High school</td>
<td>0.74 0.55 – 1.00 0.009</td>
<td>0.76 0.48 – 1.20 0.118</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>0.84 0.56 – 1.26 0.266</td>
<td>1.78 0.77 – 4.09 0.075</td>
</tr>
<tr>
<td><strong>Body mass index</strong></td>
<td>0.98 0.89 – 1.08 0.564</td>
<td>0.95 0.80 – 1.14 0.481</td>
</tr>
<tr>
<td><strong>Falls</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.98 0.79 – 1.20 0.773</td>
<td>1.21 0.90 – 1.65 0.100</td>
</tr>
<tr>
<td><strong>Prior fracture</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.00 0.79 – 1.25 0.958</td>
<td>1.20 0.81 – 1.79 0.241</td>
</tr>
<tr>
<td><strong>Osteoporosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.96 0.74 – 1.25 0.695</td>
<td>1.05 0.67 – 1.65 0.772</td>
</tr>
<tr>
<td><strong>Polypharmacy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.78 0.53 – 1.17 0.114</td>
<td>0.89 0.47 – 1.69 0.647</td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.77 1.32 – 2.38 &lt;0.001</td>
<td>1.79 1.00 – 3.20 0.010</td>
</tr>
<tr>
<td><strong>Alcohol intake</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.17 0.86 – 1.55 0.168</td>
<td>1.08 0.66 – 1.78 0.680</td>
</tr>
<tr>
<td><strong>Hospitalization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.42 1.09 – 1.84 0.001</td>
<td>1.03 0.59 – 1.81 0.887</td>
</tr>
<tr>
<td>EQ5D5L</td>
<td>0.50 0.31 – 0.81 &lt;0.001</td>
<td>0.59 0.23 – 1.51 0.146</td>
</tr>
<tr>
<td><strong>Frailty status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefrail</td>
<td>1.31 1.00 – 1.72 0.010</td>
<td>1.45 0.86 – 2.45 0.065</td>
</tr>
<tr>
<td>Frail</td>
<td>1.60 1.16 – 2.21 &lt;0.001</td>
<td>2.82 1.49 – 5.34 &lt;0.001</td>
</tr>
</tbody>
</table>

HR, hazard ratio; CI, confidence interval; EQ5D5L, measure for health-related quality of life; *expressed as change per 5-unit increase; preventable attrition (attrition due to refusals and loss of contact) non-preventable attrition (attrition due to death and cognitive impairment)