**Additional File 1**

**Table S1. Parameter estimates for the models run**

| Model | Estimate | SE |
|---|---|---|
| *(a)* GLM - ESS score as a continuous variable | | |
| (Intercept) | 0.6241 | 0.0475 |
| ESS Score | -0.0068 | 0.0009 |
| OSA without narcolepsy | -0.0221 | 0.0367 |
| OSA and narcolepsy | -0.1641 | 0.0627 |
| Age | 0.0006 | 0.0004 |
| CCI | -0.0353 | 0.0041 |
| Female | -0.0582 | 0.0119 |
| Married | 0.0287 | 0.0118 |
| Medium Income (20,000-39,999) | 0.0494 | 0.0124 |
| High Income (≥40,000) | 0.0525 | 0.0142 |
| BMI ≥25 | -0.0083 | 0.0136 |
| Former smoker | 0.0050 | 0.0120 |
| Current smoker | -0.0015 | 0.0142 |
| Drinks alcohol | 0.0506 | 0.0124 |
| Exercises | 0.1071 | 0.0104 |
| (Scale) | 0.061 [a] | 0.0018 |
| *(b)* GLM - US/RoW cutoffs (reference 0-10) | | |
| (Intercept) | 0.5909 | 0.0466 |
| Mild EDS (ESS, 11-12) | -0.0134 | 0.0174 |
| Moderate EDS (ESS, 13-15) | -0.0505 | 0.0165 |
| Severe EDS (ESS, 16-24) | -0.1132 | 0.0159 |
| OSA without narcolepsy | -0.0238 | 0.0367 |
| OSA and narcolepsy | -0.1667 | 0.0626 |

| | | |
|---|---|---|
| Age | 0.0006 | 0.0004 |
| CCI | -0.0354 | 0.0041 |
| Female | -0.0573 | 0.0119 |
| Married | 0.0301 | 0.0118 |
| Medium Income (20,000-39,999) | 0.0498 | 0.0124 |
| High Income (≥40,000) | 0.0538 | 0.0142 |
| BMI ≥25 | -0.0088 | 0.0136 |
| Former smoker | 0.0046 | 0.0120 |
| Current smoker | -0.0040 | 0.0142 |
| Drinks alcohol | 0.0503 | 0.0124 |
| Exercises | 0.1057 | 0.0104 |
| (Scale) | 0.061 [a] | 0.0018 |
| *(c)* GLM - UK cutoffs (reference 0-10) | | |
| Intercept | 0.5918 | 0.0466 |
| Mild EDS (ESS, 11-14) | -0.0268 | 0.0138 |
| Moderate EDS (ESS, 15-18) | -0.0789 | 0.0167 |
| Severe EDS (ESS, 19-24) | -0.1513 | 0.0236 |
| OSA without narcolepsy | -0.0275 | 0.0367 |
| OSA and narcolepsy | -0.1640 | 0.0626 |
| Age | 0.0007 | 0.0004 |
| CCI | -0.0354 | 0.0041 |
| Female | -0.0575 | 0.0119 |
| Married | 0.0295 | 0.0117 |
| Medium Income (20,000-39,999) | 0.0497 | 0.0124 |
| High Income (≥40,000) | 0.0538 | 0.0142 |
| BMI ≥25 | -0.0107 | 0.0136 |
| Former smoker | 0.0032 | 0.0120 |
| Current smoker | -0.0048 | 0.0142 |

| | | |
|---|---|---|
| Drinks alcohol | 0.0494 | 0.0124 |
| Exercises | 0.1068 | 0.0104 |
| (Scale) | 0.060 [a] | 0.0018 |
| *(d)* Piecewise linear with breakpoint at 11.29 | | |
| Intercept | 0.6084 | 0.0480 |
| ESS Slope 1 (ESS, <11.29) | -0.0028 | 0.0018 |
| ESS Slope 2 (ESS, >11.29) | -0.0134 | 0.0031 |
| OSA without narcolepsy | -0.0262 | 0.0368 |
| OSA and narcolepsy | -0.1621 | 0.0628 |
| Age | 0.0006 | 0.0004 |
| CCI | -0.0353 | 0.0041 |
| Female | -0.0579 | 0.0119 |
| Married | 0.0295 | 0.0118 |
| Medium Income (20,000-39,999) | 0.0496 | 0.0124 |
| High Income ($\geq$40,000) | 0.0534 | 0.0143 |
| BMI $\geq$25 | -0.0094 | 0.0137 |
| Former smoker | 0.0045 | 0.0121 |
| Current smoker | -0.0028 | 0.0142 |
| Drinks alcohol | 0.0495 | 0.0125 |
| Exercises | 0.1061 | 0.0104 |
| *(e)* Linear spline with breakpoint at 11 | | |
| Intercept | 0.6080 | 0.0479 |
| ESS Slope 1 (ESS, 0-11) | -0.0026 | 0.0016 |
| ESS Slope 2 (ESS, 12-24) | -0.0131 | 0.0022 |
| OSA without narcolepsy | -0.0260 | 0.0368 |
| OSA and narcolepsy | -0.1622 | 0.0628 |
| Age | 0.0006 | 0.0004 |
| CCI | -0.0352 | 0.0041 |

| | | |
|---|---|---|
| Female | -0.0579 | 0.0119 |
| Married | 0.0295 | 0.0118 |
| Medium Income (20,000-39,999) | 0.0496 | 0.0124 |
| High Income (≥40,000) | 0.0534 | 0.0143 |
| BMI ≥25 | -0.0095 | 0.0137 |
| Former smoker | 0.0045 | 0.0121 |
| Current smoker | -0.0028 | 0.0142 |
| Drinks alcohol | 0.0496 | 0.0124 |
| Exercises | 0.1060 | 0.0104 |

a. Maximum likelihood estimate.

BMI: body mass index; CCI: Charlson Comorbidity Index; EDS: excessive daytime sleepiness; ESS: Epworth Sleepiness Scale; OSA: obstructive sleep apnoea; SE: standard error; RoW: rest of world; UK: United Kingdom; US: United States.

**Table S2. Parameter estimates for linear spline regression model: estimation sample**

| | Estimate | Std. Error | Difference from full sample |
|---|---|---|---|
| Intercept | 0.6163 | 0.0541 | 0.0083 |
| ESS, 0-11 | -0.0019 | 0.0018 | 0.0007 |
| ESS, 12-24 | -0.0126 | 0.0025 | 0.0005 |
| OSA without narcolepsy | -0.0304 | 0.0415 | -0.0043 |
| OSA and narcolepsy | -0.1600 | 0.0699 | 0.0022 |
| Age | 0.0006 | 0.0005 | <0.0001 |
| CCI | -0.0366 | 0.0046 | -0.0013 |
| Female | -0.0618 | 0.0134 | -0.0039 |
| Married | 0.0193 | 0.0133 | -0.0102 |
| Medium Income (20,000-39,999) | 0.0506 | 0.0139 | 0.0009 |
| High Income (≥40,000) | 0.0533 | 0.0160 | -0.0001 |
| BMI ≥25 | -0.0102 | 0.0154 | -0.0007 |
| Former smoker | 0.0101 | 0.0135 | 0.0056 |
| Current smoker | 0.0006 | 0.0158 | 0.0034 |
| Drinks alcohol | 0.0430 | 0.0139 | -0.0066 |
| Exercises | 0.1069 | 0.0117 | 0.0009 |

BMI: body mass index; CCI: Charlson Comorbidity Index; EDS: excessive daytime sleepiness; ESS: Epworth

Sleepiness Scale; OSA: obstructive sleep apnoea; SE: standard error

**Table S3. Fit statistics of estimation sample: overall and by EQ-5D quartile**

| R2 | RMSE | MAE | Prediction Error |
|---|---|---|---|
| 0.181 | 0.244 | 0.186 | 0.358 |

| Quartile | RMSE | Minimum EQ-5D | Maximum EQ-5D |
|---|---|---|---|
| 1st | 0.382 | -0.358 | 0.536 |
| 2nd | 0.100 | 0.536 | 0.755 |
| 3rd | 0.159 | 0.755 | 0.887 |
| 4th | 0.239 | 0.887 | 1.000 |

EQ-5D: EuroQoL- 5 Dimensions; MAE: mean absolute error; RMSE: root mean square error.

**Table S4. Slope estimates for piecewise linear regression model with breakpoint of ESS score 11.00:**

**estimation sample**

| | Estimate | SE | t-value | 95% CI |
|---|---|---|---|---|
| Slope 1 (ESS, 0-11) | -0.0019 | 0.0021 | -0.943 | [-0.006; 0.0021] |
| Slope 2 (ESS, 12-24) | -0.0126 | 0.0035 | -3.603 | [-0.0194; -0.0057] |

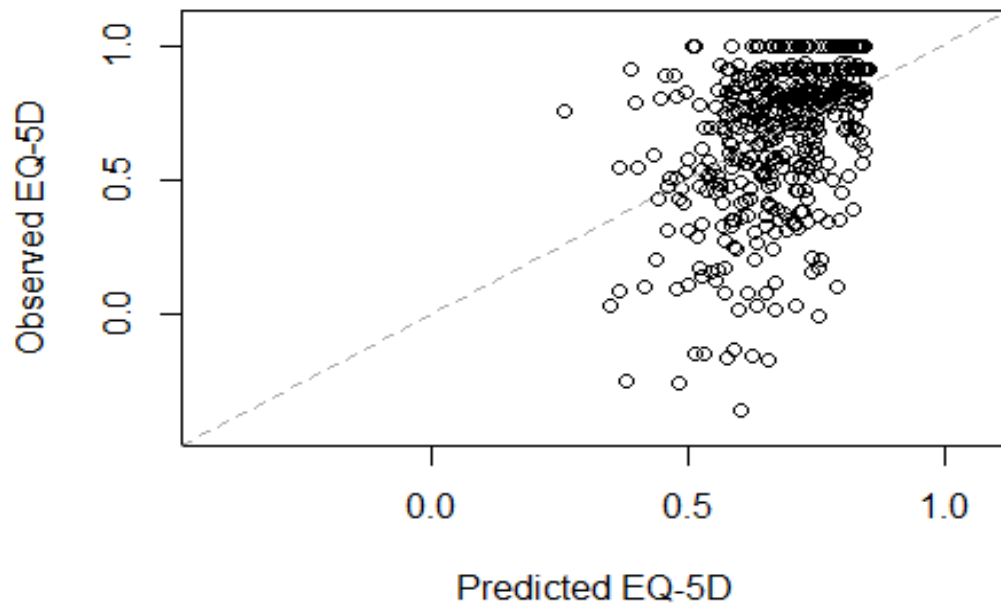CI: confidence interval; ESS: Epworth Sleepiness Scale; SE: standard error.

**Figure S1. Observed versus predicted EQ-5D utility: estimation sample**
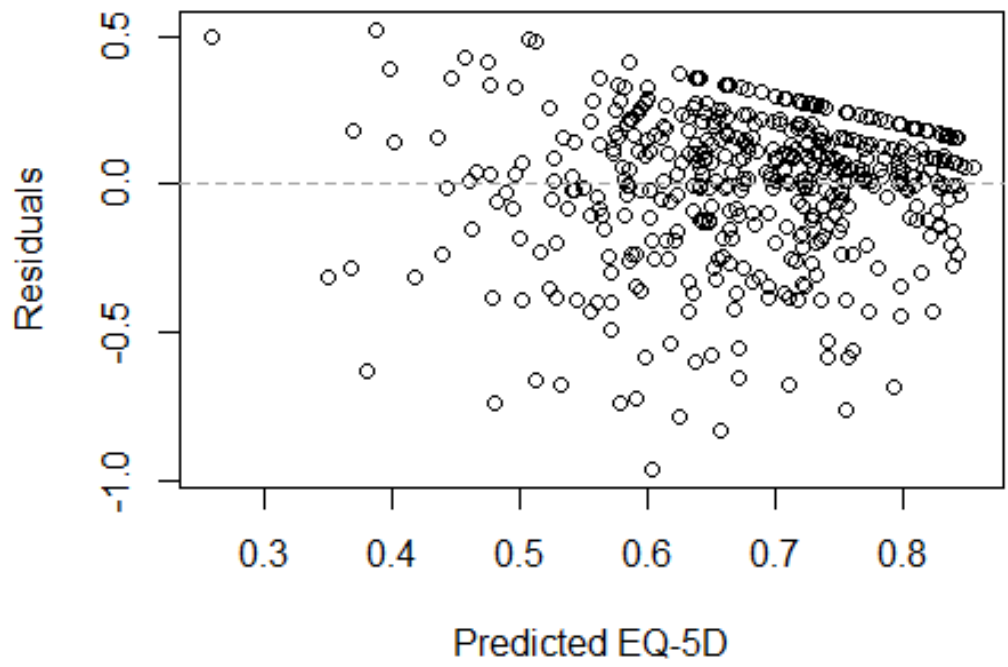EQ-5D: EuroQoL- 5 Dimensions.

**Figure S2. Residual plot for observed versus predicted EQ-5D utility: estimation sample**
EQ-5D: EuroQoL- 5 Dimensions.