

## **Loneliness monetisation report**

### **Analysis for the Department for Digital, Culture, Media & Sport**

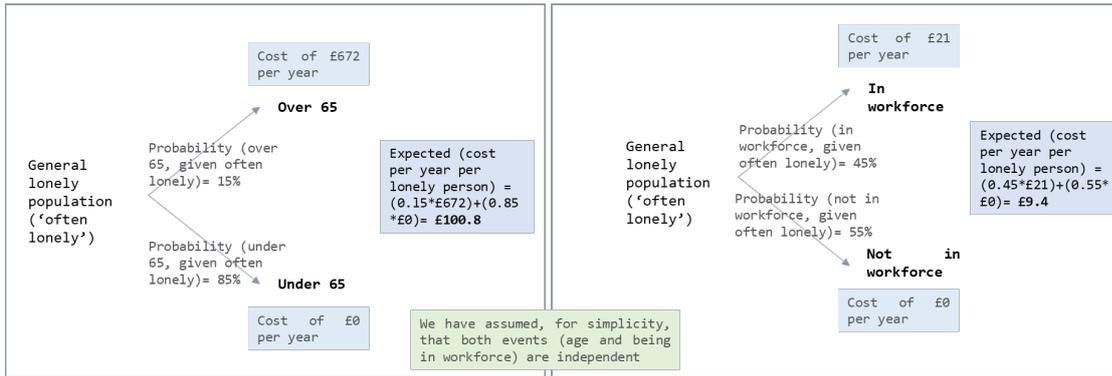
### **Technical Annex**

#### **1. Aggregation of impacts from several sources into a figure applicable to the general lonely population**

We have produced a figure that can be applied to a general 'lonely' population (a one-size-fits-all figure). For mild and moderate loneliness impacts, only the wellbeing impacts are relevant (due to lack of evidence on health and productivity impacts) and therefore we do not need to make adjustments for age and working status (wellbeing or its absence is a state that is relevant to *everyone*).

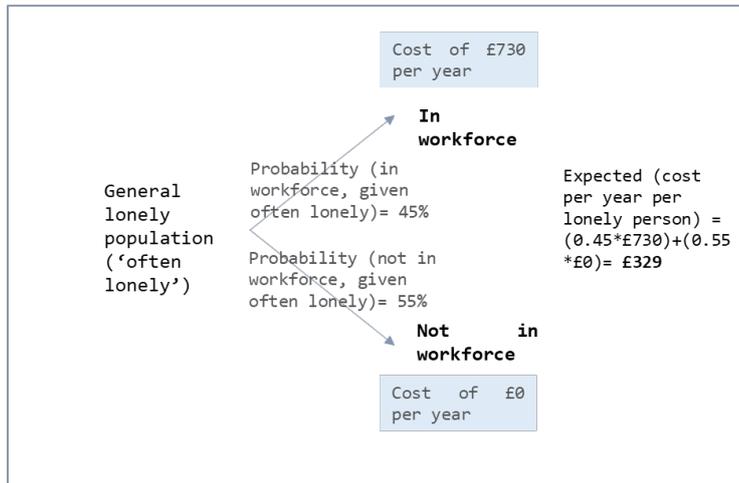
When considering the impacts of *severe* loneliness, we have to take into account that not all people with severe loneliness are in work (therefore liable to suffer from productivity impacts) or are over 65 (the only subset for which we have robust estimates of health impacts). The adjustments we detail here (and in the report) ensure that the final figure is the *average* cost for a person afflicted with severe loneliness. The probabilities featured in these probability trees are derived from Wave 9 of Understanding Society.

## Average health costs of loneliness (severe loneliness cohort)



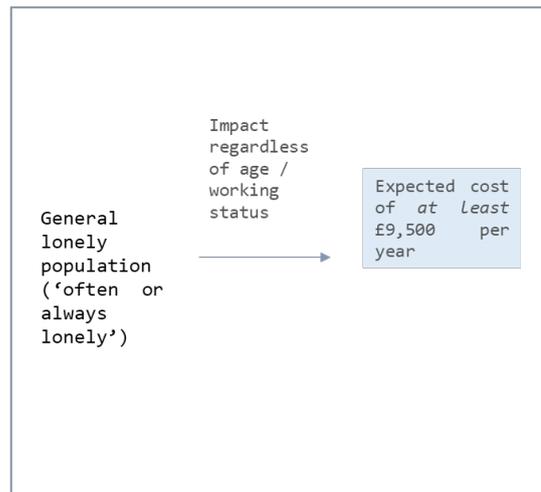
Expected health costs among a general cohort of 'often lonely' people: £109 (= £100.8+£9.4)

## Average productivity costs of loneliness (severe loneliness cohort)



Expected health costs among a general cohort of 'often lonely' people: £329

## Average wellbeing costs of loneliness (severe loneliness cohort)



Expected wellbeing costs among a general cohort of 'often lonely' people: £9,500

In order to apply figures to a specific context (for example, a cohort strictly composed of over-65s) the probabilities above can be modified thus deviating from a one-size-fits-all value.

## 2. Wellbeing Valuation Method

A full development of the Wellbeing Valuation method is available in:

*Fujiwara, Daniel (2013) A general method for valuing non-market goods using wellbeing data: three-stage wellbeing valuation. CEP Discussion Papers (CEPD1233). Centre for Economic Performance, London School of Economics and Political Science, London, UK.*

The wellbeing value for alleviating loneliness is expressed as the 'compensating surplus'. From the above paper, it is given by the following:

$$CS = e^{\left[ \frac{-g'_Q}{f'_M} + \ln(M^0) \right]} - M^0$$

Where:

- $M^0$  is the reference income,
- $g'_Q$  is the marginal impact of loneliness on life satisfaction, *and*
- $f'_M$  is the impact of annual income on life satisfaction.

Ensuring consistency across other Wellbeing Valuation estimates, we use a reference income of £30,000 per year.

In order to arrive to the estimates described in paper (the compensating surplus or willingness to pay in £), the formula above should be applied using the following inputs:

- $M^0$ : A reference income of £30,000 per year
- $g'_Q$ : A marginal impact of loneliness from the regression tables below (for example, 0.266 for going from 'hardly ever' to 'never' lonely based on the Community Life Survey regression)
- $f'_M$ : The impact of annual income on life satisfaction equal to 1.103 according the latest estimate from the Fujiwara paper cited above.

### 3. Effect of loneliness on wellbeing: regression outputs

#### 2.1 Community Life Survey

Control variables: Year of interview, household size, log-equivalised household income, male, age, age squared, marital status, ethnicity, living in urban area, housing tenure, economic status, government office region, face-to-face survey, neighbourhood belonging and liking the local area.

#### Community Life Survey regression: marginal impacts on life satisfaction and p-value

Variables	Coefficient (Marginal impact on life satisfaction [1-7])
Loneliness = 1, [1] Often/always vs. [5] Never	-1.964
	0
Loneliness = 2, [2] Some of the time vs. [5] Never	-1.038
	0
Loneliness = 3, [3] Occasionally vs. [5] Never	-0.688
	0
Loneliness = 4, [4] Hardly ever vs. [5] Never	-0.266
	0
Year of interview = 2014	0.0607
	0.0209

Year of interview = 2015	0.108
	2.34e-05
Year of interview = 2016	0.108
	0.000182
Year of interview = 2017	0.107
	0.000500
Year of interview = 2018	0.0934
	0.00211
Year of interview = 2019	0.0743
	0.0429
Household size	0.0126
	0.0362
Log-equivalised household income	0.119
	0
Male	-0.110
	0
Age	-0.0443
	0
Age squared	0.000419
	0
Marital status = 2, [2] married or in same sex civil partnership and living with partner	0.133
	0
Marital status = 3, [3] separated, but still legally married	-0.0110
	0.783
Marital status = 4, [4] divorced	0.0915
	0.000289
Marital status = 5, [5] widowed	0.130
	5.27e-05
Ethnicity = 2, [2] Asian	0.0643
	0.00333
Ethnicity = 3, [3] Black	0.0776
	0.0500
Ethnicity = 4, [4] Mixed/Other	-0.0294
	0.430
Urban	0.00177
	0.908
Housing_tenure = 2, [2] Rent	-0.0888
	1.19e-08
Housing_tenure = 3, [3] Other	-0.0289
	0.298
Respondent economic status 3 categories = 2, [2] Unemployed	-0.352
	0
Respondent economic status 3 categories = 3, [3] Economically Inactive	0.0221
	0.171
Region (former Government Office Region) = 2, [2] North West	-0.0363
	0.296
Region (former Government Office Region) = 3, [3] Yorkshire and Humberside	-0.0501

	0.163
Region (former Government Office Region) = 4, [4] East Midlands	-0.0321
	0.381
Region (former Government Office Region) = 5, [5] West Midlands	-0.0807
	0.0237
Region (former Government Office Region) = 6, [6] East of England	-0.0767
	0.0263
Region (former Government Office Region) = 7, [7] London	-0.113
	0.000850
Region (former Government Office Region) = 8, [8] South East	-0.0772
	0.0202
Region (former Government Office Region) = 9, [9] South West	-0.0114
	0.742
Face to face interview	0.279
	0
Neighbourhood_belonging = 2, [2] not very strongly	-0.193
	0
Neighbourhood_belonging = 3, [3] not at all strongly	-0.348
	0
Like local area = 2, [2] neither satisfied nor dissatisfied	-0.325
	0
Like local area = 3, [3] fairly/very dissatisfied	-0.537
	0
Constant	5.770
	0
Observations	30,538
R-squared	0.319

## 2.2 Understanding Society

Control variables: life satisfaction in previous wave, any friends, neighbourhood belonging, economic status, male, age, age squared, marital status, number of children in household, ethnicity, degree, house owned, wants to move house, survey wave, interview season, log-equivalised household income, subjective health status, living in urban area, government office region, being a carer.

Weight used: Cross-sectional adult self-completion interview weight.

### Understanding Society regression: marginal impacts on life satisfaction and p-value

Variables	Coefficient (Marginal impact on life satisfaction [1-7])
How often feels lonely = 2, [2] Some of the time (vs. Hardly ever/never)	-0.418
	0
How often feels lonely = 3, [3] Often (vs. Hardly ever/never)	-1.134
	0
Life satisfaction (1-7) in previous wave	0.315
	0
Any friends	0.196
	0.000340
Belong to neighbourhood? (agree/strongly agree)	0.219
	0
Unemployed	-0.200
	0.000917
Retired	0.230
	0
Student	0.0619
	0.267
Long term sick	-0.353
	2.90e-08
Other	0.0340
	0.473
Male	-0.0635
	0.000661
Age	-0.0210
	1.00e-08
Age squared	0.000202
	3.13e-08
Married or civil partner or living as a couple	0.0463
	0.149
Divorced or former civil partner	0.0617
	0.183
Widowed or surviving civil partner	0.0836
	0.104
Separated from husband / wife / civil partner	-0.0959
	0.249
Number of own children in household	0.00116
	0.930
Asian	-0.0844
	0.0607
Black	-0.151
	0.0884

Other ethnicity	-0.148
	0.0347
Degree of higher as highest qualification	0.0255
	0.177
House owned	-0.00660
	0.787
Respondent would prefer to move house	-0.138
	1.48e-10
Spring	0.00458
	0.858
Autumn	-0.0250
	0.317
Winter	-0.0478
	0.0596
Log equivalised household income (+1 correction)	0.0546
	0.000145
General health, good, very good or excellent (5-point)	0.582
	0
Rural	-0.0256
	0.230
GOR: North west	-0.0754
	0.172
GOR: Yorkshire and the Humber	-0.0824
	0.151
GOR: East midlands	0.0381
	0.499
GOR: West midlands	-0.00664
	0.907
GOR: East of England	-0.0242
	0.666
GOR: London	-0.114
	0.0542
GOR: South east	-0.0481
	0.370
GOR: South west	-0.0401
	0.470
GOR: Wales	-0.0803
	0.168
GOR: Scotland	-0.0793
	0.161
GOR: Northern Ireland	0.0558
	0.356
Cares for handicapped/other in household	-0.189
	2.70e-07
Constant	3.075

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	0
Observations	24,730
R-squared	0.359

## 2.2 Understanding Society – with job satisfaction as an added control

Control variables: job satisfaction, life satisfaction in previous wave, any friends, neighbourhood belonging, economic status, male, age, age squared, marital status, number of children in household, ethnicity, degree, house owned, wants to move house, survey wave, interview season, log-equivalised household income, subjective health status, living in urban area, government office region, being a carer.

Weight used: Cross-sectional adult self-completion interview weight.

### Understanding Society regression with job satisfaction as an added control: marginal impacts on life satisfaction and p-value

Variables	Coefficient (Marginal impact on life satisfaction [1-7])
How often feels lonely = 2, [2] Some of the time (vs. Hardly ever/never)	-0.406
	0
How often feels lonely = 3, [3] Often (vs. Hardly ever/never)	-1.115
	0
Life satisfaction in previous wave	0.308
	0
Any friends	0.195
	0.000362
Belong to neighbourhood? (agree/strongly agree)	0.213
	0
Unemployed	-0.280
	0.000102
Retired	0.163
	0.00260
Student	0.00584
	0.924
Long term sick	-0.450
	4.91e-09
Other	-0.0345
	0.552
Male	-0.0600
	0.00124
Age	-0.0209
	1.10e-08
Age squared	0.000199
	5.10e-08
Married or civil partner or living as a couple	0.0476
	0.136
Divorced or former civil partner	0.0604
	0.192

Widowed or surviving civil partner	0.0833
	0.104
Separated from husband / wife / civil partner	-0.0876
	0.285
Number of own children in household	3.93e-05
	0.998
Asian	-0.0933
	0.0390
Black	-0.147
	0.101
Other ethnicity	-0.145
	0.0373
Degree of higher as highest qualification	0.0269
	0.153
House owned	0.00212
	0.931
Respondent would prefer to move house	-0.122
	1.35e-08
Spring	0.00476
	0.852
Autumn	-0.0291
	0.243
Winter	-0.0471
	0.0629
Log equivalised household income (+1 correction)	0.0593
	4.08e-05
General health, good, very good or excellent (5-point)	0.568
	0
Rural	-0.0291
	0.170
GOR: North west	-0.0823
	0.133
GOR: Yorkshire and the Humber	-0.0875
	0.124
GOR: East midlands	0.0330
	0.556
GOR: West midlands	-0.0126
	0.823
GOR: East of England	-0.0280
	0.615
GOR: London	-0.120
	0.0405
GOR: South east	-0.0498
	0.349
GOR: South west	-0.0459
	0.406
GOR: Wales	-0.0869
	0.133
GOR: Scotland	-0.0852
	0.129
GOR: Northern Ireland	0.0408

	0.497
Cares for handicapped/other in household	-0.193
	1.49e-07
Satisfied with job	0.459
	0
Satisfied with job: Not applicable	0.487
	0
Constant	2.677
	0
Observations	24,712
R-squared	0.365