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Generating Patient-Relevant Outcomes for Loneliness Interventions: A Novel Approach to Quantifying Loneliness Over Time

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Introduction

Loneliness is a public health concern with negative effects on physical and mental well-being. The De Jong Gierveld Loneliness Scale (DJGLS) is a widely used instrument for measuring loneliness[1,2]. To our best knowledge, there is no method to quantify loneliness over time. This study introduces a novel approach to quantify longitudinal data on loneliness by converting DJGLS scores into loneliness-free days (LFD).

Figure 1. Assignment of the DJGLS states to loneliness utility values

Methods

Loneliness is assessed at several time points instead of every day. DJGLS scores indicate being:

- 0-2 "not lonely"
- 3-8 "moderately lonely"
- 9-11 "strongly lonely"[1,2]

We followed the approach of estimating depression-free days from the Patient Health questionnaire[3]. DJGLS scores are weighted by the time between assessment points. LFD are calculated as the area under the loneliness-utility curve.
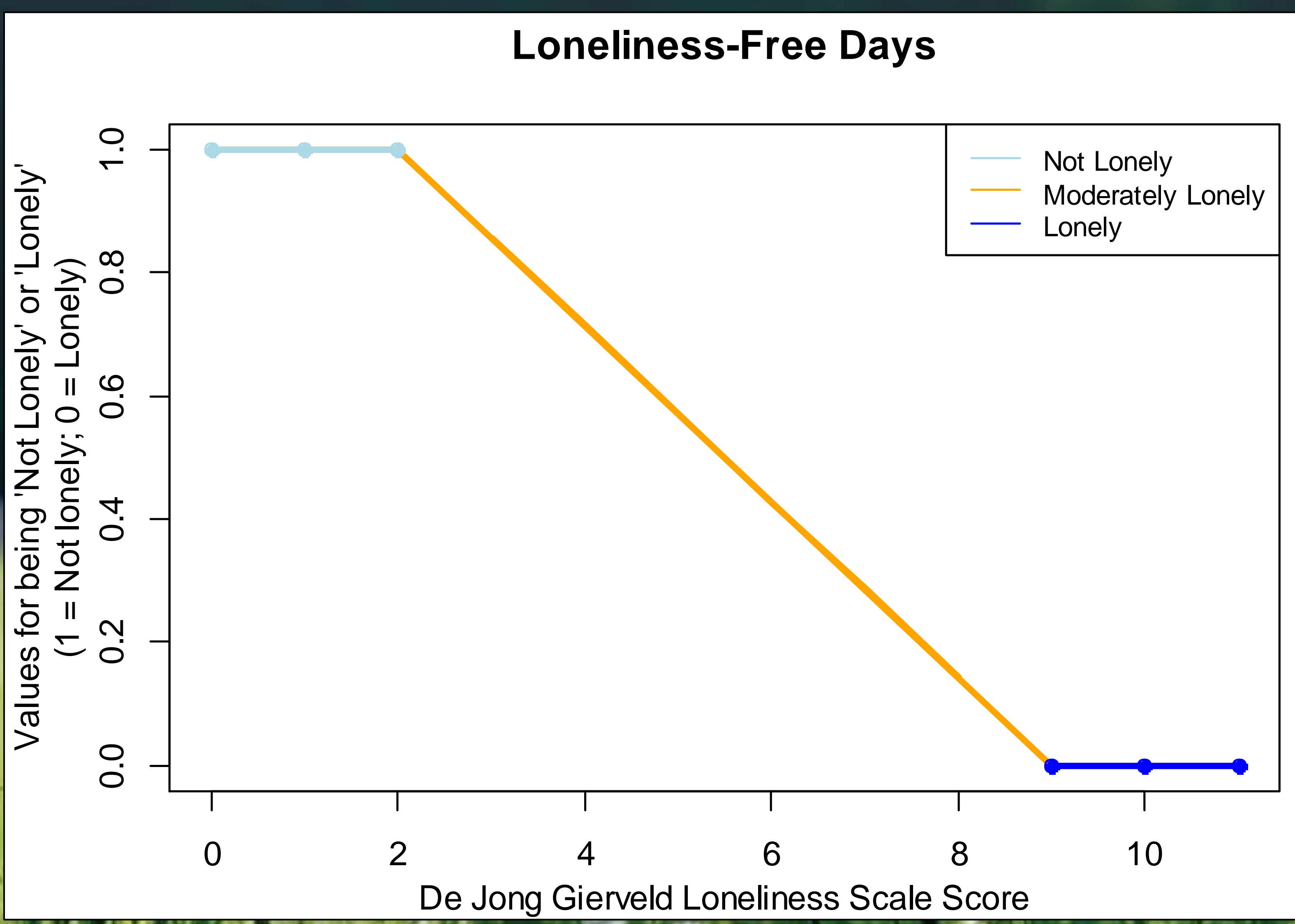
Results

Figure 1 shows the assignment of DJGLS states to loneliness utility values:

- "not lonely": 1
- "strongly lonely": 0
- "moderately lonely": 0 - 1 by linear interpolation

Multiplying the mean loneliness utility value between two time points with the corresponding days and summing up the estimations for each interval, results in total LFD over the assessment period. A hypothetical example is shown in Table 1 and Figure 2 calculating LFD as area under the loneliness-utility curve.

Table 1. Hypothetical example

Timepoint (t)	DJGLS Score	Loneliness Utility Value
0 (at baseline)	10	0
1 (after 90 days)	9	0
2 (after 180 days)	6	0.4
3 (after 360 days)	2	1

LFD = 90days * (0+0)/2 + 90days * (0+0.4)/2 + 180days * (0.4+1)/2 = 144 days free of loneliness
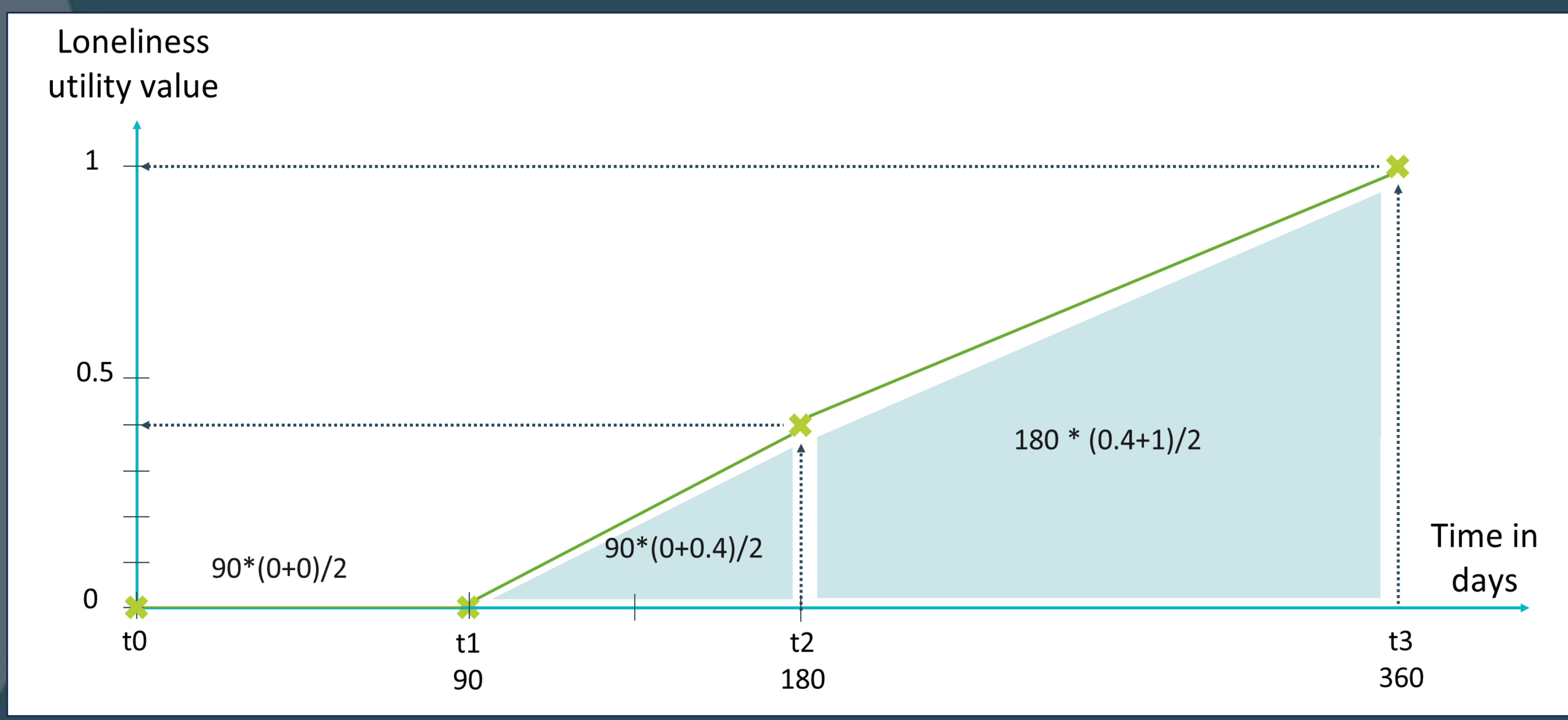

Figure 2. Calculation of total loneliness-free days (hypothetical example)

Conclusion

The conversion of DJGLS scores into corresponding loneliness utility values between 0 and 1 and transformation into LFD offers an approach to quantifying loneliness over time. Although the relationship between the DJGLS and loneliness utility values may be different from our linear assumption, LFD could be considered as a patient-relevant outcome indicator and used as denominator in cost-effectiveness analyses.

References:
1. de Jong-Gierveld, J. and T.G. van Tilburg. Manual of the Loneliness Scale (Updated from the printed version: 24-2-2022). 2022. Retrieved 03.05.2024 from https://home.fsw.vu.nl/tg.van.tilburg/manual_loneliness_scale_1999.html.
2. de Jong-Gierveld, J. and T.G. van Tilburg. Cut-off points for the De Jong Gierveld loneliness scale. 1999. Retrieved 03.05.2024 from https://home.fsw.vu.nl/tg.van.tilburg/Cut-off%20points%20for%20the%20De%20Jong%20Gierveld%20loneliness%20scale.pdf.
3. Vannoy, S.D., P. Arean, and J. Unützer. Advantages of Using Estimated Depression-Free Days for Evaluating Treatment Efficacy. Psychiatric Services, 2010. 61(2): p. 160-163.

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