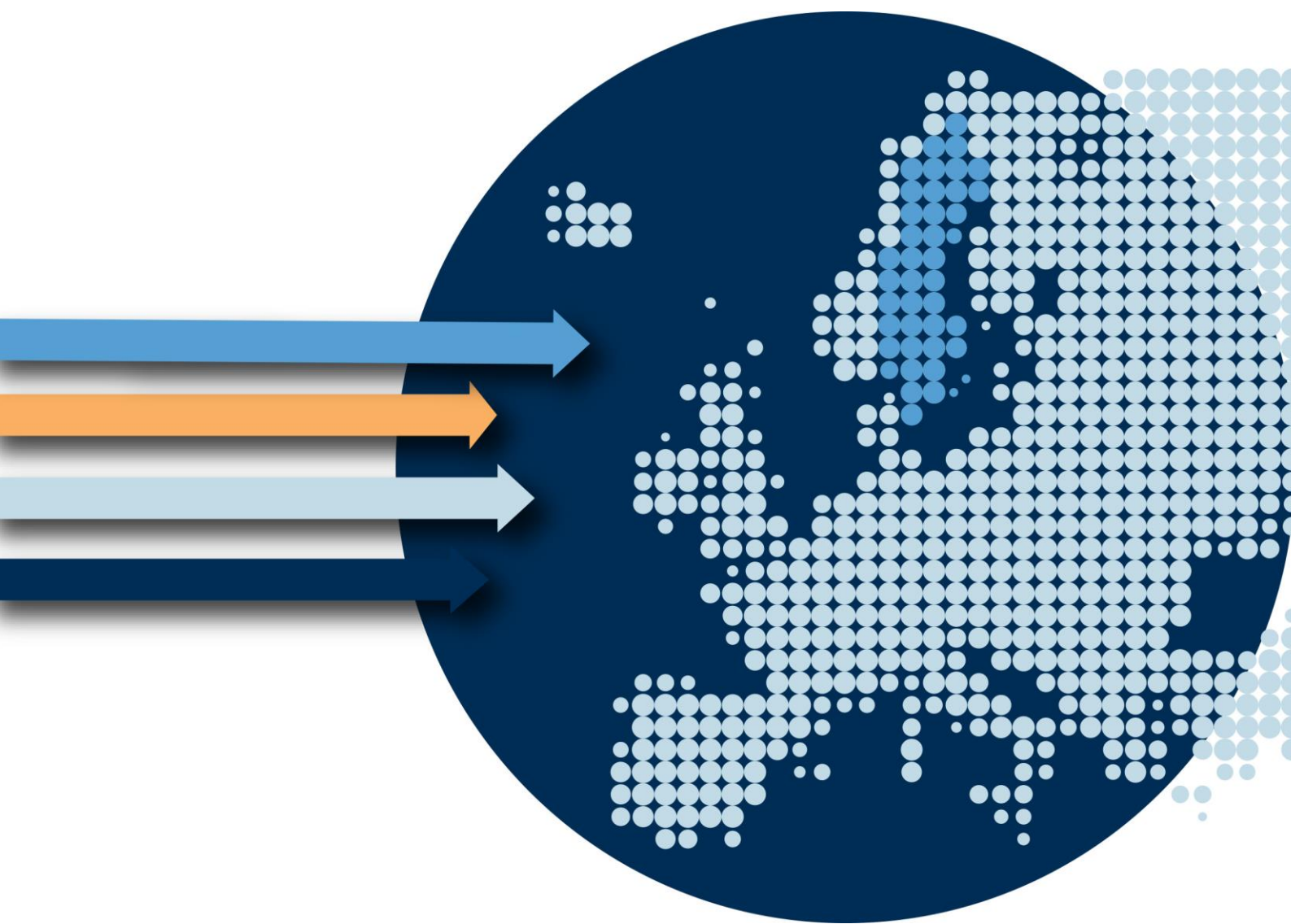


# QUALITY OF LIFE IN THE SWEDISH GENERAL POPULATION DURING COVID-19 – BASED ON MEASUREMENT PRE- AND POST PANDEMIC OUTBREAK



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**QUALITY-OF-LIFE IN THE SWEDISH GENERAL POPULATION DURING COVID-19**  
– BASED ON MEASUREMENT PRE- AND POST PANDEMIC OUTBREAK

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## Executive Summary

The outbreak of the pandemic COVID-19 (Corona Virus) has resulted in international and national strategies, such as social distancing and travel bans, which have mitigated the health loss due to the pandemic but also given rise to a severe economic crisis. Both factors, the pandemic, and the economic crisis, can be expected to have an impact on the quality-of-life of the population. The objective of this study was to estimate the impact on the quality-of-life of the Swedish adult population during the outbreak of the COVID-19 pandemic.

A web-based survey was sent to randomised samples of the adult Swedish population before the outbreak of the pandemic in Sweden in February 2020 (n=1,016) and during the outbreak of the pandemic in Sweden in April 2020 (n=1,003). Quality-of-life was measured using a Visual Analogue Scale (VAS) and the EQ-5D-5L (April survey only). The result from another study (Burström et al. 2020) was used as a baseline for the EQ-5D-5L measurement.

The result of the survey shows a reduction in average quality-of-life between February and April 2020 in the adult Swedish population of 0.07 based on VAS and 0.042 based on the EQ-5D-5L. The loss in quality-of-life appears to be primarily driven by economic worry. The total QALY loss during April 2020 amounts to around 29,000 QALYs based on the EQ-5D-5L measurement and around 42,000 QALYs based on the VAS measurement. The result of this study supports a wide public health perspective that consider health losses both as a consequence of the pandemic itself and as a consequence of the mitigation strategies.

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## Foreword

The Swedish Institute for Health Economics (IHE) has, in collaboration with researchers at the University of Southern California (USC), performed a study of the impact on the quality-of-life of the Swedish adult population during the outbreak of the COVID-19 pandemic (Corona). The study shows a reduction in quality-of-life that is primarily driven by economic worry, supporting the continuing use of a wide public health perspective where consideration is given to potential health losses both as a consequence of the pandemic itself and as a consequence of the mitigation strategies.

Lund, October 2020

Peter Lindgren  
Managing Director

# 1. Background

The outbreak of the COVID-19 pandemic (Corona Virus) has resulted in unprecedented measures such as closed borders, travel bans, school closures, and wide scale social distancing including local and national lockdowns<sup>1</sup> (1). These measures have already had a large impact on the economy, resulting in a sharp decline in economic activity, rising absenteeism, rising unemployment, and falling stock markets. The response to the health crisis has given rise to an economic crisis. Although lockdowns have now been lifted in most countries to mitigate the economic consequences, but not all.

Unlike many other countries, including its neighbours Denmark, Norway and Finland, Sweden has chosen to apply a less restrictive strategy and has, as of yet, not implemented a full lockdown. A wider public health perspective has been used as an argument for, for instance, not closing schools, as school closures could lead to worsening of health and quality-of-life for children both in the short- and long term. In a recent study of the health economic consequences of different mitigation and suppression strategies for COVID-19 in Norway, a range of different wider public health outcomes are listed, for example, reduced physical activity, increased loneliness, and rising unemployment (2).

Although health consequences from a wider public health perspective are increasingly acknowledged, there are few studies that have estimated quality-of-life at the population level during the pandemic using standardized instruments for health economic studies (3, 4) and, to our knowledge, no study that has estimated the difference in quality-of-life compared to pre-pandemic measurements.

## 1.1 Objective

The purpose of this study is to estimate the impact of COVID-19 on quality-of-life in the Swedish adult population during the outbreak of the pandemic (April 2020) using a national survey.

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<sup>1</sup> Regulations/legislation regarding strict face-to-face social interaction: including the banning of any non-essential public gatherings, closure of educational and public/cultural institutions, ordering people to stay home apart from exercise and essential tasks (Flaxman et al. 2020).

## 2. Methods

### 2.1 Quality-Adjusted Life-Years (QALYs)

A quality-adjusted life-year (QALY) is the standard outcome measure in most health economic analyses. The measure can be used to measure health losses of varying types, for example, temporary pain to a fatal disease, and therefore allows comparison across different types of health losses. QALYs are calculated by multiplying the time in a specific health state with the quality-of-life measured in that health state. Time is expressed in terms of number of years, while quality-of-life is expressed using an index measure called utility, on a scale from 0 (representing death) to 1 (representing full health). One QALY is equal to full health for one year. Utility is measured using direct (visual analogue scale (VAS), standard gamble, time trade off) or indirect (e.g., EQ-5D) methods.

### 2.2 Survey

A web-based questionnaire was sent by Enkätfabriken (<https://www.enkatfabriken.se/>) to stratified, randomized samples of the adult general population in Sweden in internet panels<sup>2</sup> in February 2020 (before the start of the pandemic outbreak in Sweden) and April 2020 (during the pandemic outbreak in Sweden). The samples were stratified based on gender, age and place of residence (NUTS statistical regions) to be representative of the Swedish general population. The questionnaire included informed consent, background questions (age, sex, number of household members, education, occupation and income) and a question on quality-of-life using VAS, a rating scale from 0 (worst imaginable health state) to 100 (best imaginable health state) where the respondent is asked to rate their current health. The April survey also included the EQ-5D-5L (a questionnaire that can be used to indirectly derive health-related<sup>3</sup> quality-of-life using value sets from TTO surveys of the general population), the PHQ-4 (The four-item Patient Health Questionnaire for anxiety and depression) and questions related to perception and experience of COVID-19. Data was collected until 1,000 responses had been reached. The February survey (February, 18-25) was sent to 3,096 individuals and 1,016 (33%) completed the questionnaire. The April survey (April, 7-14) was sent to 4,792

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<sup>2</sup> An internet panel consists of individuals from the general population (total n ~ 200 000) who have agreed to answer to web-based questionnaires on a regular basis. The respondents are enrolled from randomized samples identified from population registries, and receive a small compensation based on fair market value and compliant with all applicable laws, codes of conduct applicable professional standards for their participation.

<sup>3</sup> The EQ-5D questionnaire focus on five dimensions related to health including mobility, self-care, performance of usual activities, pain/discomfort, and anxiety/depression.

individuals and 1,003 (21%) completed the questionnaire. The April survey was sent to a larger sample to take account of a lower response rate during Easter (April, 10-13).

## 2.3 Analysis

The loss in quality-of-life was estimated by using VAS and the EQ-5D index. The VAS comparison was based on the measurement in February and April 2020. To control for differences in sample characteristics, the impact of the pandemic based on VAS measurement was estimated by performing OLS regression with quality-of-life measured using VAS as a dependent variable and background variables and time of measurement as independent variables. The EQ-5D comparison was performed by using a baseline estimate from a survey in parts of Sweden (CDUST=Uppsala, Sörmland, Västmanland, Värmland and Örebro) in 2017 (5) as the EQ-5D was not included in the February survey. Since no EQ-5D index was reported for the 2017 survey, a weighted mean index was calculated. The weighted mean EQ-5D index was calculated by (i) multiplying the share of respondents (%) with a level below 1 on the EQ-5D-5L with the loss in quality-of-life according to the value set in Devlin et al. 2018 (6), (ii) summarizing the loss in quality-of-life, and (iii) subtracting the total weighted loss from 1. The number of QALYs lost was calculated for April 2020. At the population level, we calculated the loss by multiplying the loss in quality-of-life (difference between February and April 2020) by the population in each age group (7) and then divided it by 12 (months).



## 3. Results

### 3.1 Sample

The sample in the April 2020 measurement were younger, less educated and had a lower income compared to the sample in the February 2020 measurement. The 2017 sample from Burström et al. 2020 (5) was used as a baseline for the EQ-5D comparison. This sample had a higher mean age compared to the sample in the April 2020 measurement.

*Table 1. Respondent characteristics*

| Variable                                    | Sweden<br>February 2020<br>(n=1,016) | Sweden<br>April 2020<br>(n=1,003) | p-value | Sweden<br>(CDUST)<br>2017(5)<br>(n=25,867) |
|---|--------------------------------------|-----------------------------------|---------|--|
| Mean age (SD)                               | 50,0 (17.6)                          | 47.8 (17.1)                       | 0.0040  | 64.3 (16.0)                                |
| Female                                      | 56.1%                                | 50.6%                             | 0.0140  | 52.6%                                      |
| One adult in household                      | 34.7%                                | 38.0%                             | 0.1301  | -  |
| Child(ren) in household                     | 30.5%                                | 31.4%                             | 0.6642  | -  |
| University education (at least 3 years)     | 35.4%                                | 30.6%                             | 0.0212  | 33.6% <sup>a</sup>                         |
| Employed                                    | 56.2%                                | 51.2%                             | 0.0446  | -  |
| Self-employed                               | 2.5%                                 | 4.8%                              | 0.0051  | -  |
| Mean household income per month in SEK (SD) | 45,950 (22,259)                      | 40,034 (22,022)                   | 0.0000  | -  |

<sup>a</sup>"High education"

### 3.2 Quality-of-life Using VAS

The mean quality-of-life measured on a VAS scale was 77.1 (SD: 17.7) in February 2020 and 68.7 (SD: 68.7) in April 2020, resulting in a reduction of 8.4 percentage points between the pre- and post-pandemic outbreak measurements ( $p < 0.000$ ). Adjusting for differences in respondent characteristics, resulted in a reduction of 7.0 percentage points ( $p < 0.000$ ), see pooled sample (i.e. February + April sample) in regression 3, Table 2. Worry about COVID-19 related to the economy had a larger and more significant impact on the quality-of-life in April 2020 compared to worry about COVID-19 related to health (regression 2, Table 2). Being employed also had a larger impact on quality-of-life in April (regression 2, Table 2) compared to in February (regression 1, Table 2). Being female or

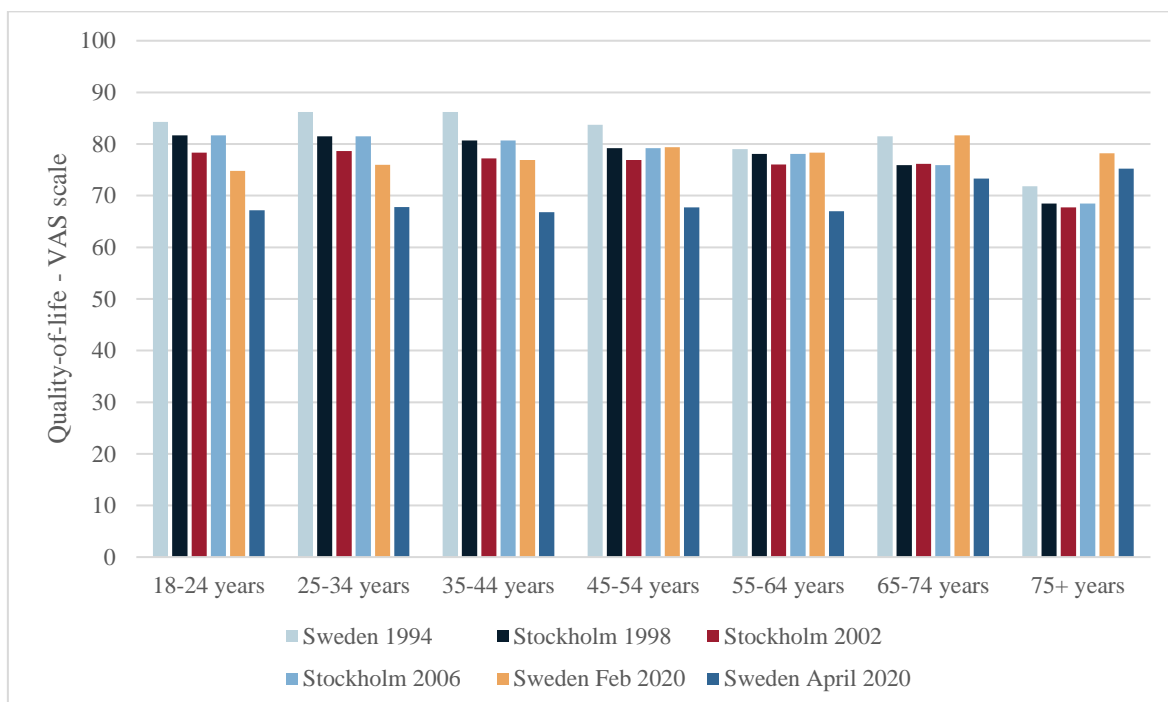
only adult in household had a significant impact on QoL in April (regression 2, Table 2) but no impact on QoL in February (regression 1, Table 2).

*Table 2. Regressions of QoL on VAS scale*

| Variable                                | (1)<br>February 2020 | (2)<br>April 2020 | (3)<br>Pooled sample<br>(February + April) |
|---|----------------------|-------------------|--|
| 25-34 yrs vs. 18-24 yrs                 | -5.839*              | -2.998            | -4.089*                                    |
|   | (3.051)              | (2.871)           | (2.106)                                    |
| 35-44 yrs vs. 18-24 yrs                 | -6.360**             | -2.975            | -4.959**                                   |
|   | (3.125)              | (2.969)           | (2.154)                                    |
| 45-54 yrs vs. 18-24 yrs                 | -4.153               | -1.991            | -3.704*                                    |
|   | (3.124)              | (2.824)           | (2.094)                                    |
| 55-64 yrs vs. 18-24 yrs                 | -3.218               | -1.055            | -2.706                                     |
|   | (3.073)              | (2.953)           | (2.132)                                    |
| 65-74 yrs vs. 18-24 yrs                 | 1.361                | 9.830***          | 5.791***                                   |
|   | (2.973)              | (2.999)           | (2.114)                                    |
| 75 yrs+ vs. 18-24 yrs                   | 2.193                | 12.35***          | 7.109***                                   |
|   | (3.239)              | (3.686)           | (2.419)                                    |
| Female=1                                | -1.787               | -3.328**          | -2.833***                                  |
|   | (1.267)              | (1.363)           | (0.937)                                    |
| One adult in household=1                | 0.0707               | -5.110***         | -2.075*                                    |
|   | (1.512)              | (1.625)           | (1.114)                                    |
| Child(ren) in household=1               | -0.912               | -0.389            | -0.393                                     |
|   | (1.670)              | (1.642)           | (1.171)                                    |
| University education=1                  | 2.103                | 0.0184            | 1.291                                      |
|   | (1.348)              | (1.573)           | (1.042)                                    |
| Employed=1                              | 6.450***             | 11.02***          | 9.253***                                   |
|   | (1.810)              | (1.731)           | (1.250)                                    |
| Self-employed=1                         | -4.451               | -3.432            | -3.470                                     |
|   | (3.925)              | (3.174)           | (2.450)                                    |
| Income                                  | 0.000138***          | 5.45e-05          | 0.000102***                                |
|   | (3.74e-05)           | (4.03e-05)        | (2.76e-05)                                 |
| <b>April=1</b>                          | -                    |                   | <b>-7.046***</b>                           |
|   |                      |                   | <b>(0.935)</b>                             |
| Worry about COVID-19 related to health  | -                    | -0.606**          |  |
|   |                      | (0.303)           |  |
| Worry about COVID-19 related to economy | -                    | -0.846***         |  |
|   |                      | (0.305)           |  |
| Constant                                | 70.41***             | 70.24***          | 70.02***                                   |
|   | (3.138)              | (3.219)           | (2.276)                                    |
| Observations                            | 816                  | 888               | 1,704                                      |
| R-squared                               | 0.075                | 0.150             | 0.134                                      |

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The pre-pandemic outbreak measurement in February 2020 (77.1) was similar to the mean VAS score in a large-scale study of the Swedish population in 2017 (76.1) (5). Comparing the pre-pandemic outbreak measurement in February 2020 to population norms from 1994 (8), 1998 (9), 2002 (10), and 2006 (11) suggests a decline in quality-of-life among the younger age groups (Figure 1). The older age groups (65 years+) have a higher quality-of-life in February 2020 compared to previous population norms.

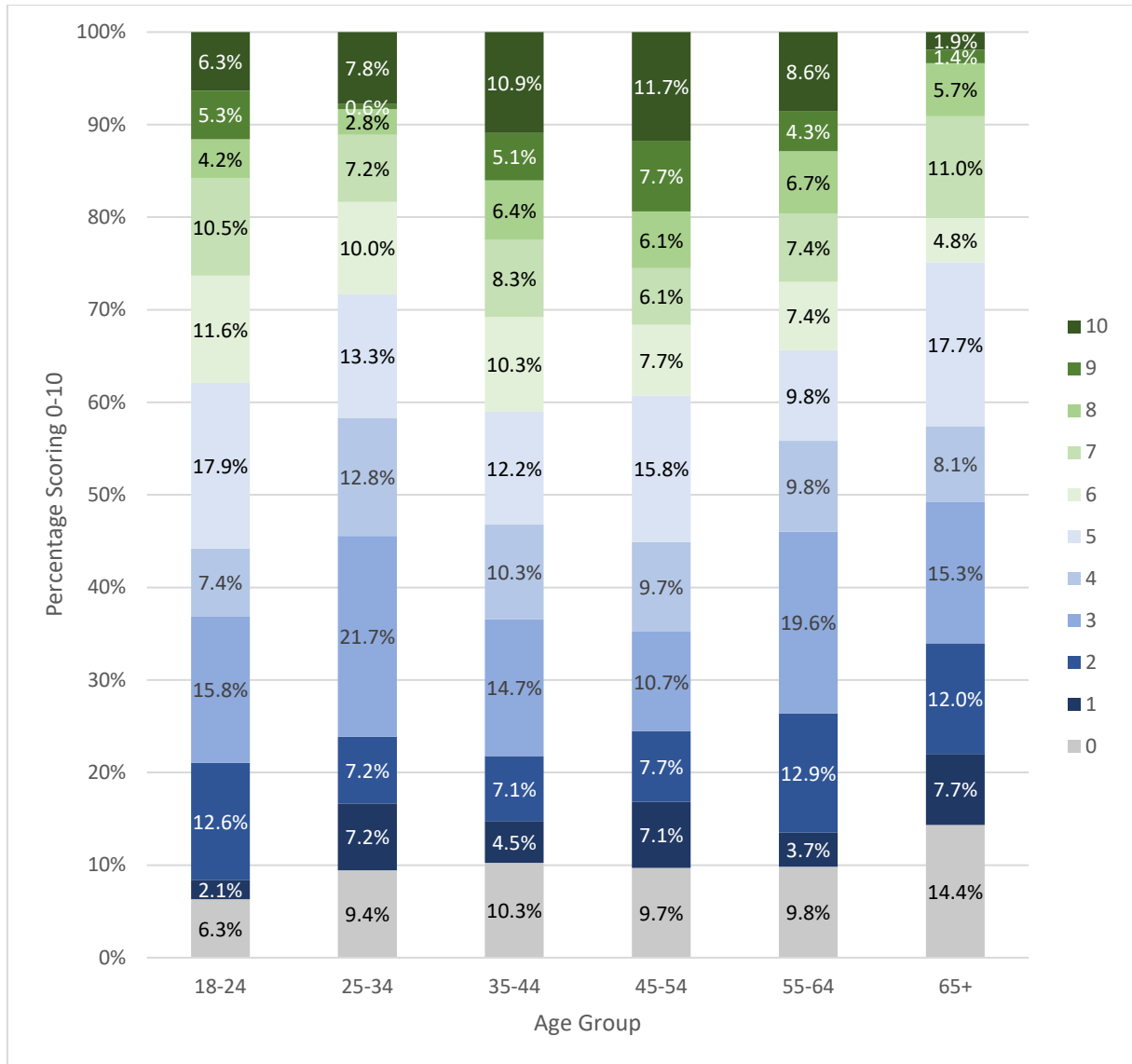


**Figure 1.** Quality-of-life by age and over time, VAS scale

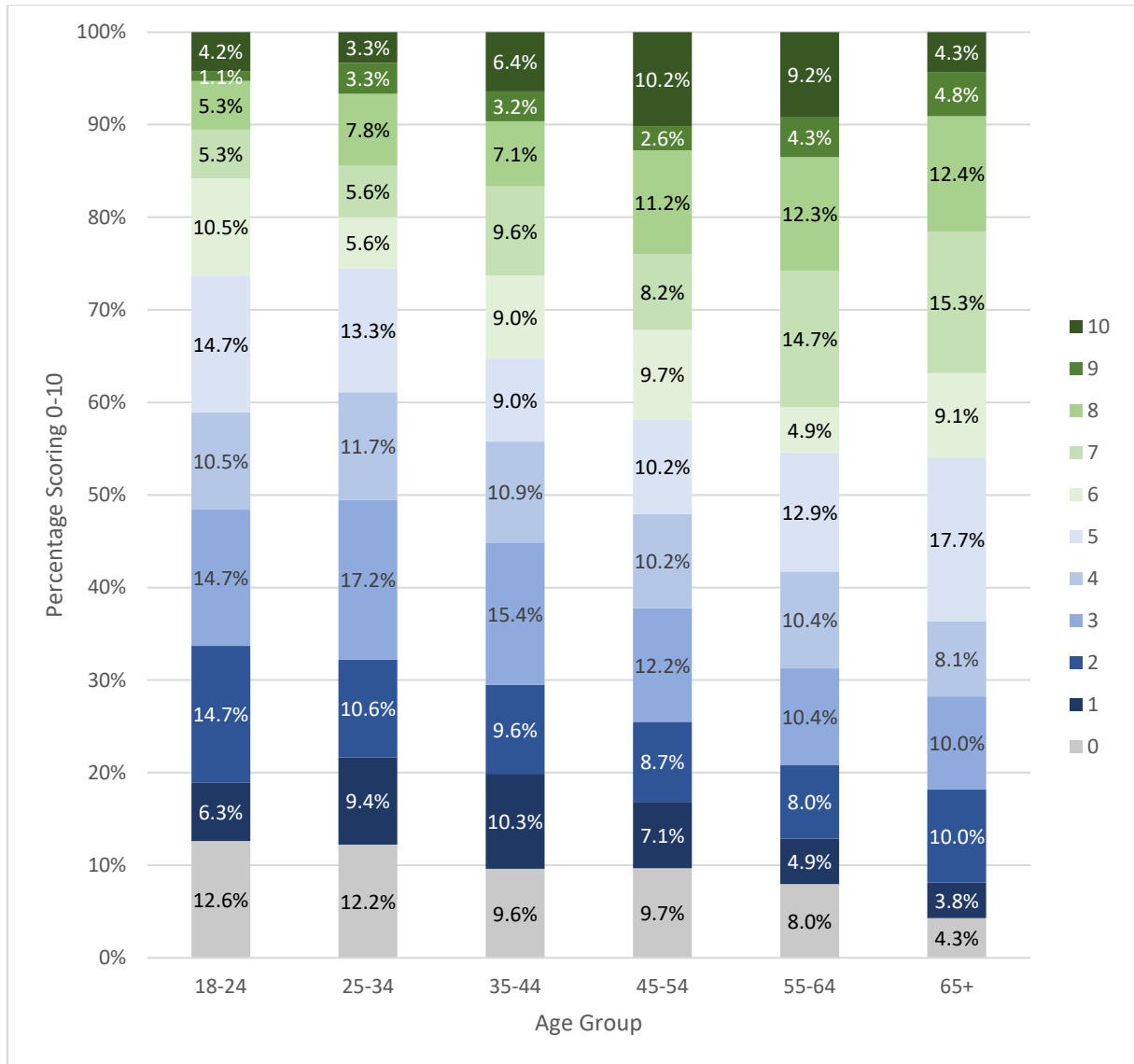
The reduction in quality-of-life was larger among younger respondents, and only significant for respondents in the working age group (<65 years), Table 3. Figure 2 also shows that respondents in the working age group were more worried about COVID-19 with respect to their own economy. For example, around 40% of respondents 35-44 years old rated worry about Covid-19 with respect to their own economic situation for the foreseeable future above 5 on a scale from 0 (not at all worried) to 10 (extremely worried), while the corresponding share for respondents 65 years old or older was only 25%. A larger reduction in quality-of-life was shown in respondents in households with one adult compared to other households, which might suggest that loneliness and less socializing also contribute to a lower quality-of-life.

**Table 3. Regression estimates for April by subgroup**

| Variable               | Subgroup                        | n    | Coefficient for April<br>(Percentage points, VAS) | p-value |
|------------------------|---------------------------------|------|---|---------|
| Age                    | 18-24 years                     | 123  | -12.59  | 0.003   |
|                        | 25-34 years                     | 293  | -7.91   | 0.001   |
|                        | 35-44 years                     | 298  | -7.71   | 0.001   |
|                        | 45-54 years                     | 328  | -5.85   | 0.008   |
|                        | 55-64 years                     | 261  | -8.92   | 0.000   |
|                        | 65-74 years                     | 261  | -3.59   | 0.125   |
|                        | 75 years +                      | 144  | -3.05   | 0.272   |
| Sex                    | Female                          | 874  | -8.21   | 0.000   |
|                        | Male                            | 834  | -5.78   | 0.000   |
| Household members      | One adult in household          | 642  | -8.87   | 0.000   |
|                        | Two or more adults in household | 1066 | -6.13   | 0.000   |
|                        | Child(ren) in household         | 534  | -7.09   | 0.000   |
|                        | No child(ren) in household      | 1174 | -7.10   | 0.000   |
| Education              | University education            | 587  | -7.33   | 0.000   |
|                        | No university education         | 1121 | -6.56   | 0.000   |
| Occupation             | Employed                        | 885  | -6.49   | 0.000   |
|                        | Self-employed                   | 65   | -3.80   | 0.553   |
|                        | Retired                         | 425  | -3.88   | 0.036   |
|                        | Student                         | 128  | -8.70   | 0.026   |
|                        | Unemployed                      | 60   | -10.42  | 0.076   |
| Household income (SEK) | >19,999 per month               | 311  | -9.94   | 0.001   |
|                        | 20,000-29,999 per month         | 291  | -2.74   | 0.251   |
|                        | 30,000-39,999 per month         | 286  | -5.06   | 0.039   |
|                        | 40,000-49,999 per month         | 222  | -10.08  | 0.000   |
|                        | 50,000-59,999 per month         | 185  | -8.43   | 0.001   |
|                        | 60,000-60,999 per month         | 130  | -4.68   | 0.076   |
|                        | 70,000-79,999 per month         | 126  | -5.69   | 0.086   |
|                        | 80,000+ per month               | 157  | -9.25   | 0.000   |
| Region                 | Southern Sweden                 | 246  | -0.49   | 0.848   |
|                        | Småland and the Islands         | 143  | -8.34   | 0.018   |
|                        | Western Sweden                  | 313  | -8.89   | 0.000   |
|                        | Stockholm                       | 400  | -8.74   | 0.000   |
|                        | Eastern Middle Sweden           | 287  | -9.58   | 0.000   |
|                        | Northern Middle Sweden          | 150  | -9.02   | 0.019   |
|                        | Middle Norrland                 | 73   | 2.19  | 0.673   |
|                        | Upper Norrland                  | 92   | -9.94   | 0.024   |



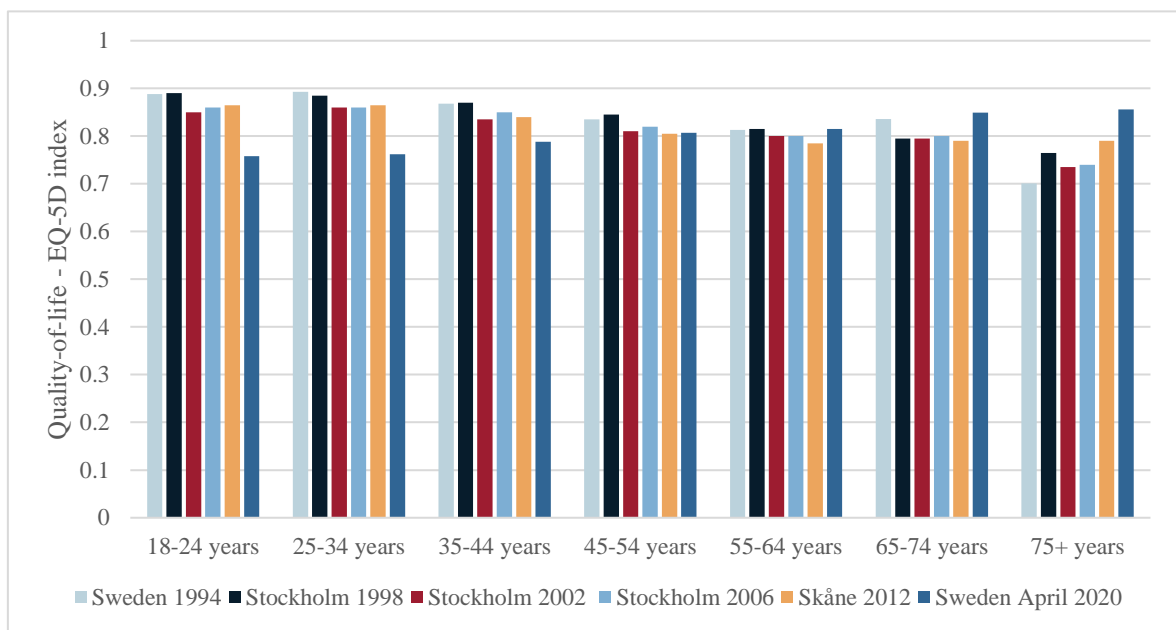
**Figure 2.** Fear of COVID-19 Impact on Own Economic Situation for the Foreseeable Future (0 (not at all worried)-10 (extremely worried))



**Figure 3.** Fear of COVID-19 Impact on Own Health (0 (not at all worried)-10 (extremely worried))

### 3.3 Quality-of-life Using EQ-5D

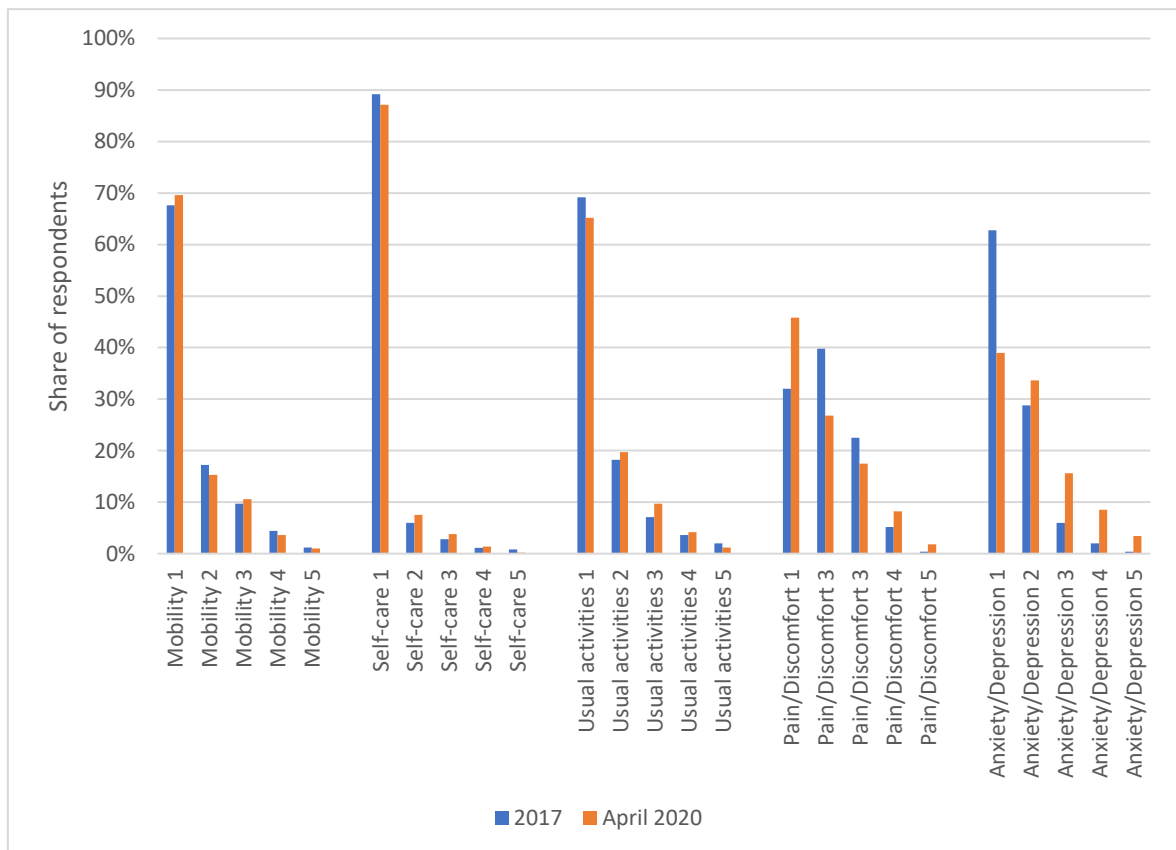
The mean health-related quality-of-life measured using the EQ-5D-5L was 0.802 (SD: 0.208) in April 2020. Since the EQ-5D-5L was not included in the February survey, we need another source for the baseline estimate. The post-pandemic outbreak measurement in April 2020 is compared to previous population norms based on the EQ-5D-3L (9-12) in Figure 4. This comparison shows a decline in health-related quality-of-life for respondents between 18 and 44 years old. However, these comparisons should be interpreted with caution as the EQ-5D-3L is not directly comparable to the EQ-5D-5L<sup>4</sup>.



**Figure 4.** Health-related Quality-of-life by age and over time, EQ-5D index (April 2020 = EQ-5D-5L, Before April 2020 = EQ-5D-3L)

<sup>4</sup> The value set for the EQ-5D-3L generates lower health-related quality-of-life compared to the value set for the EQ-5D-5L (Devlin et al. 2018).

The only measurement using EQ-5D-5L in Sweden is a survey in 2017 (5). The 2017 survey showed a much lower share of respondents with anxiety or depression compared to the post pandemic outbreak measurement in April 2020 (Figure 5). The publication for the 2017 survey did not present any EQ-5D index. By using the respondent distribution across EQ-5D dimensions and levels, we can estimate a weighted mean. This would result in a baseline average health-related quality-of-life of 0.838 (Table 4). Comparing this to the health-related quality-of-life in April 2020 estimated using the same procedure (0.796), results in an average loss in health-related quality-of-life of 0.042.



**Figure 5.** Comparison of response to EQ-5D-5L dimensions in 2017 (Burström et al. 2020) and in April 2020 (post pandemic outbreak)



**Table 4. Weighted mean EQ-5D-5L index for 2017 and April 2020**

| Dimension – Level  | (A)<br>Share of<br>respondents<br>2017 (5) | (B)<br>Share of<br>respondents<br>April 2020 | (C)<br>Reduction in<br>QoL, Devlin<br>et al. 2018<br>(6) | (A x C)<br>Mean<br>reduction<br>2017 <sup>a</sup> | (B x C)<br>Mean<br>reduction<br>April 2020 <sup>b</sup> |
|--|--|--|--|---|---|
| Mobility 1   | 68%  | 70%  | 0.000  | 0.0000  | 0.0000  |
| Mobility 2   | 17%  | 15%  | 0.058  | 0.0100  | 0.0089  |
| Mobility 3   | 10%  | 11%  | 0.076  | 0.0074  | 0.0081  |
| Mobility 4   | 4%   | 4%   | 0.207  | 0.0091  | 0.0075  |
| Mobility 5   | 1%   | 1%   | 0.274  | 0.0033  | 0.0027  |
|  |  |  |  |   |   |
| Self-care 1  | 89%  | 87%  | 0.000  | 0.0000  | 0.0000  |
| Self-care 2  | 6%   | 8%   | 0.050  | 0.0030  | 0.0038  |
| Self-care 3  | 3%   | 4%   | 0.080  | 0.0022  | 0.0030  |
| Self-care 4  | 1%   | 1%   | 0.164  | 0.0018  | 0.0023  |
| Self-care 5  | 1%   | 0%   | 0.203  | 0.0016  | 0.0004  |
|  |  |  |  |   |   |
| Usual activities 1   | 69%  | 65%  | 0.000  | 0.0000  | 0.0000  |
| Usual activities 2   | 18%  | 20%  | 0.08   | 0.0146  | 0.0158  |
| Usual activities 3   | 7%   | 10%  | 0.063  | 0.0045  | 0.0061  |
| Usual activities 4   | 4%   | 4%   | 0.162  | 0.0058  | 0.0068  |
| Usual activities 5   | 2%   | 1%   | 0.184  | 0.0037  | 0.0022  |
|  |  |  |  |   |   |
| Pain/Discomfort 1  | 32%  | 46%  | 0.000  | 0.0000  | 0.0000  |
| Pain/Discomfort 3  | 40%  | 27%  | 0.063  | 0.0251  | 0.0169  |
| Pain/Discomfort 3  | 23%  | 18%  | 0.084  | 0.0189  | 0.0147  |
| Pain/Discomfort 4  | 5%   | 8%   | 0.276  | 0.0144  | 0.0226  |
| Pain/Discomfort 5  | 0%   | 2%   | 0.335  | 0.0013  | 0.0060  |
|  |  |  |  |   |   |
| Anxiety/Depression 1   | 63%  | 39%  | 0.000  | 0.0000  | 0.0000  |
| Anxiety/Depression 2   | 29%  | 34%  | 0.078  | 0.0225  | 0.0262  |
| Anxiety/Depression 3   | 6%   | 16%  | 0.104  | 0.0062  | 0.0162  |
| Anxiety/Depression 4   | 2%   | 9%   | 0.285  | 0.0057  | 0.0242  |
| Anxiety/Depression 5   | 0%   | 3%   | 0.289  | 0.0012  | 0.0098  |
|  |  |  |  |   |   |
| <b>TOTAL mean reduction<br/>in quality-of-life<br/>(weighted mean)</b> |  |  |  | <b>0.1622</b>                                     | <b>0.2042</b>   |
| <b>Mean quality-of-life<br/>(weighted mean)<sup>c</sup></b>            |  |  |  | <b>0.8378</b>                                     | <b>0.7958</b>   |

<sup>a</sup>Share of respondents 2017 x Reduction in QoL, Devlin et al. 2018.

<sup>b</sup>Share of respondents April 2020 x Reduction in QoL, Devlin et al. 2018.

<sup>c</sup>1-TOTAL mean reduction in quality-of-life.

### 3.4 Total QALY Loss in the Swedish Adult Population During One Month with COVID-19

The total QALY loss in April 2020 sum to 41,729 QALYs using the VAS measurement and 28,515 QALYs using the EQ-5D index measurement (Table 5). This can be compared to the total QALY loss due to road traffic injuries during an entire year in Sweden, which sum to 59,367 QALYs (13).

Due to limitations in the data available for the baseline EQ-5D estimation, the EQ-5D comparison is only performed at the population level and not for different age groups.

*Table 5. QALY loss in April 2020*

| Age              | Population <sup>a</sup> | QoL loss                 | QALY-loss per year | QALY-loss per month |
|------------------|-------------------------|--------------------------|--------------------|---------------------|
| 18-24 år         | 810,921                 | 0.1259 <sup>b</sup>      | 102,095            | 8,508               |
| 25-34 år         | 1,455,587               | 0.0791 <sup>b</sup>      | 115,137            | 9,595               |
| 35-44 år         | 1,281,861               | 0.0771 <sup>b</sup>      | 98,831             | 8,236               |
| 45-54 år         | 1,344,847               | 0.0585 <sup>b</sup>      | 78,674             | 6,556               |
| 55-64 år         | 1,188,498               | 0.0892 <sup>b</sup>      | 106,014            | 8,835               |
| 65-74 år         | 1,100,463               | 0.0359 <sup>bc</sup>     | -                  | -                   |
| 75 år +          | 964,904                 | 0.0305 <sup>bc</sup>     | -                  | -                   |
| <b>ALL VAS</b>   | <b>8,147,081</b>        | <b>0.061<sup>d</sup></b> | <b>500,751</b>     | <b>41,729</b>       |
|                  |                         |                          |                    |                     |
| <b>ALL EQ-5D</b> | <b>8,147,081</b>        | <b>0.042<sup>e</sup></b> | <b>342,177</b>     | <b>28,515</b>       |

<sup>a</sup>SCB, 2019.

<sup>b</sup>Regression coefficient for VAS scale April vs Feb 2020.

<sup>c</sup>Not significant.

<sup>d</sup>Weighted mean based on Population and QoL loss

<sup>e</sup>Based on comparison of weighted means.

## 4. Discussion

This study shows that the Swedish adult population has experienced a loss in quality-of-life during COVID-19. The loss was only significant for respondents in the working age population (under 65 years old) and economic worry appears to be a primary driver for the loss in quality-of-life.

The loss in quality-of-life was estimated using two approaches, VAS scale and the EQ-5D-5L. The strength of the measurement using VAS is that it was used in both the February and the April survey, thus making it possible to control for confounding factors such as time and sample characteristics. The limitation of the VAS measurement is that it is not a preference-based measure of quality-of-life. As no trade-off is required, research usually show that VAS results in lower quality-of-life compared to preference-based methods such as TTO and SG. However, a study comparing VAS and TTO for different health states generated by the EQ-5D-5L shows a similar slope (5), suggesting that changes between health states may not be overestimated using VAS.

The strength of the measurement using the EQ-5D-5L is that it is indirectly based on a preference-based measure of quality-of-life, the TTO. The limitations of the EQ-5D-5L measurement is that it was compared to a survey from 2017 as the EQ-5D-5L was not included in the February survey. Since no individual data was available for the 2017 survey, it was not possible to control for confounding factors such as respondent characteristics. Moreover, since the 2017 survey did not present any EQ-5D index, this had to be estimated using a weighted mean. Finally, as the EQ-5D is designed to capture the impact on health-related quality-of-life it may not be as responsive to non-health related changes such as economic worry. However, the measures using EQ-5D VAS may have been able to capture the additional underlying traits not measured by the EQ-5D system. As indicated in the findings, the mean quality-of-life losses measured using the VAS were greater than those measured using the EQ-5D-5L.

In summary, this study implies that there is a reduction in the quality-of-life in the Swedish adult population due to the economic crisis following the measures implemented to mitigate the COVID-19 pandemic. This suggests that it is important to consider a wider public health perspective where losses both due to COVID-19 and due to mitigation strategies are included. Future research should continue monitoring quality-of-life throughout the pandemic to see how it changes with the pandemic and the mitigation strategies.

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