***Supplementary material***

The less depressive state of Denmark

following the second wave of the COVID-19 pandemic

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THE DANISH MENTAL HEALTH AND WELL-BEING SURVEY 2016

The Danish Mental Health and Well-Being Survey 2016 (DMHWBS 2016)1 is a random representative sample of Danish men and women aged 16 years and above. Statistics Denmark sent an electronic letter to the sampled individuals in October 2016 with information about the study and an invitation to participate. After a week, a reminder letter was sent, and after yet another week, a final reminder was sent. A total of 1,656 men and 1,852 women (mean age = 47.0 years) responded to the web-based survey resulting in a response rate of 34%. The survey was registered with the Danish Data Protection Agency via its agreement with University of Southern Denmark.

**SUPPLEMENTARY TABLE 1.** WHO-5 observations and individuals in the DMHWBS 2016 and the five CCDPS 2020 waves.

|  |  |  |
| --- | --- | --- |
|  | **DMHWBS 2016** | **CCDPS 2020** |
|  | **Individuals** | **Individuals** | **Observations over five waves** |
| All | 3508 | 1195 | 5975 |
| Men  | 1656 | 649 | 3245 |
| Women | 1852 | 546 | 2730 |
| Age 18-24 | 222 | 66 | 330 |
| Age 25-34 | 282 | 149 | 745 |
| Age 35-44 | 453 | 154 | 770 |
| Age 45-54 | 667 | 255 | 1275 |
| Age 55-64 | 825 | 200 | 1000 |
| Age 65-74 | 720 | 279 | 1395 |
| Age 75+ | 241 | 92 | 460 |

**SUPPLEMENTARY FIGURE 1.** WHO-5 mean values (with 95% CI) at DMHWBS 2016 and at wave one to five of the CCDPS 2020. Stratified by age and gender.





**SUPPLEMENTARY FIGURE 2.** Changes in mean WHO-5 total scores (with 95% CI) from DMHWBS 2016 to the five waves of the CCDPS 2020. Stratified by age and sex.





**SUPPLEMENTARY FIGURE 3.** Changes in mean WHO-5 total scores (with 95% CI) from wave four to wave five of the CCDPS 2020. Stratified by age and sex.





**SUPPLEMENTARY TABLE 2.** Difference in mean WHO-5 total scores from DMHWBS 2016 as well as from wave four to wave five of the CCDPS 2020. Stratified by sex and age.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sex** | **Age** | **Comparing** | **Difference in mean total score** | **95% CI** |
| Men | 18-24 | Wave 5 vs DMHWBS 2016 | 2.63 | -7.23 to | 12.50 |
| Wave 5 vs wave 4  | 6.29 | -2.71 to | 15.29 |
| 25-34 | Wave 5 vs DMHWBS 2016 | 1.83 | -4.24 to | 7.90 |
| Wave 5 vs wave 4  | 2.39 | -0.76 to | 5.54 |
| 35-44 | **Wave 5 vs DMHWBS 2016** | **-7.44** | **-13.06 to** | **-1.82** |
| Wave 5 vs wave 4  | 0.12 | -4.50 to | 4.74 |
| 45-54 | Wave 5 vs DMHWBS 2016 | 3.82 | -1.10 to | 7.75 |
| **Wave 5 vs wave 4**  | **3.74** | **1.49 to** | **5.99** |
| 55-64 | Wave 5 vs DMHWBS 2016 | 0.97 | -3.00 to | 4.93 |
| **Wave 5 vs wave 4**  | **3.86** | **1.06 to** | **6.66** |
| 65-74 | Wave 5 vs DMHWBS 2016 | 2.36 | -0.91 to | 5.62 |
| **Wave 5 vs wave 4**  | **3.13** | **0.69 to** | **5.57** |
| 75+ | **Wave 5 vs DMHWBS 2016** | **7.38** | **1.68 to** | **13.07** |
| **Wave 5 vs wave 4**  | **3.16** | **0.42 to** | **5.89** |
| Women | 18-24 | Wave 5 vs DMHWBS 2016 | -3.54 | -10.51 to | 3.44 |
| Wave 5 vs wave 4  | 4.23 | -1.09 to | 9.55 |
| 25-34 | Wave 5 vs DMHWBS 2016 | -1.83 | -7.44 to | 3.78 |
| **Wave 5 vs wave 4**  | **5.74** | **1.58 to** | **9.91** |
| 35-44 | Wave 5 vs DMHWBS 2016 | -5.08 | -10.49 to | 0.32 |
| Wave 5 vs wave 4  | 0.83 | -3.65 to | 5.31 |
| 45-54 | Wave 5 vs DMHWBS 2016 | 2.60 | -1.84 to | 7.04 |
| Wave 5 vs wave 4  | 1.39 | -1.48 to | 4.26 |
| 55-64 | Wave 5 vs DMHWBS 2016 | 3.84 | -0.95 to | 8.62 |
| **Wave 5 vs wave 4**  | **6.96** | **3.77 to** | **10.15** |
| 65-74 | Wave 5 vs DMHWBS 2016 | 0.37 | -3.58 to | 4.32 |
| Wave 5 vs wave 4  | 3.03 | -0.09 to | 6.16 |
| 75+ | Wave 5 vs DMHWBS 2016 | 0.03 | -8.34 to | 8.39 |
| Wave 5 vs wave 4  | 3.17 | -2.51 to | 8.85 |

Bold text marks statistically significant difference with a p-value <0.05.

**SUPPLEMENTARY FIGURE 4.** Proportions (with 95% CI) with WHO-5 total scores <50 at wave 1 to 5 of the CCDPS 2020. Stratified by age. **B.** Changes in the proportion (with 95% CI) with WHO-5 total scores <50 from DMHWBS 2016 to the five waves of the CCDPS 2020. Stratified by age. **C.** Changes in the proportion (with 95% CI) with WHO-5 total scores <50 from wave four to wave five of the CCDPS 2020. Stratified by age.

**A.**

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**B.**

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**C.**

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**SUPPLEMENTARY TABLE 3.** Difference in proportions with WHO-5 total scores <50 from DMHWBS 2016 as well as from wave four to wave five of the CCDPS 2020.

|  |  |  |  |
| --- | --- | --- | --- |
| **Age** | **Comparing** | **Difference in proportions** | **95% CI** |
| 18-24 | Wave 5 vs DMHWBS 2016 | 0.03 | -0.10 to | 0.16 |
| **Wave 5 vs wave 4**  | **-0.12** | **-0.24 to** | **0.00** |
| 25-34 | Wave 5 vs DMHWBS 2016 | -0.03 | -0.11 to | 0.06 |
| **Wave 5 vs wave 4**  | **-0.08** | **-0.15 to** | **0.00** |
| 35-44 | **Wave 5 vs DMHWBS 2016** | **0.09** | **0.01 to** | **0.17** |
| Wave 5 vs wave 4  | 0.00 | -0.08 to | 0.08 |
| 45-54 | **Wave 5 vs DMHWBS 2016** | **-0.07** | **-0.13 to** | **-0.01** |
| Wave 5 vs wave 4  | -0.05 | -0.10 to | 0.00 |
| 55-64 | Wave 5 vs DMHWBS 2016 | -0.04 | -0.10 to | 0.02 |
| **Wave 5 vs wave 4**  | **-0.07** | **-0.13 to** | **-0.01** |
| 65-74 | Wave 5 vs DMHWBS 2016 | 0.00 | -0.04 to | 0.05 |
| Wave 5 vs wave 4  | -0.01 | -0.05 to | 0.03 |
| 75+ | Wave 5 vs DMHWBS 2016 | -0.06 | -0.13 to | 0.02 |
| Wave 5 vs wave 4  | -0.02 | -0.08 to | 0.04 |

Bold text marks statistically significant difference with a p-value <0.05.

**SUPPLEMENTARY FIGURE 5.** Individual WHO-5 item scores\* at wave one to five of the CCDPS 2020, stratified by age.



\* The item scores were multiplied by four to match the total scores reported in the manuscript and elsewhere in the supplement. The total score on the WHO-5 is calculated by adding the individual item scores and multiplying by four (hypothetical range: 0-100).

**SUPPLEMENTARY TABLE 4.** Difference in individual WHO-5 item scores from wave four to five of the CCDPS 2020, stratified by age.

|  |  |  |  |
| --- | --- | --- | --- |
| **Age** | **Items** | **Difference in mean score** | **95% CI** |
| 18-24 | Happy | -0,39 | -1,72 to | 0,95 |
| Relaxed | -0,40 | -1,64 to | 0,83 |
| **Vigorous** | **1,55** | **0,07 to** | **3,03** |
| **Rested** | **1,54** | **0,48 to** | **2,61** |
| **Interesting** | **2,75** | **1,44 to** | **4,06** |
| 25-34 | Happy | 0,63 | -0,04 to | 1,30 |
| Relaxed | -0,30 | -0,98 to | 0,38 |
| **Vigorous** | **1,29** | **0,42 to** | **2,15** |
| Rested | 0,46 | -0,37 to | 1,29 |
| **Interesting** | **1,70** | **1,02 to** | **2,39** |
| 35-44 | Happy | 0,31 | -0,43 to | 1,04 |
| Relaxed | -0,32 | -1,14 to | 0,50 |
| Vigorous | 0,47 | -0,38 to | 1,32 |
| Rested | -0,16 | -1,05 to | 0,73 |
| Interesting | 0,16 | -0,67 to | 1,00 |
| 45-54 | Happy | 0,37 | -0,04 to | 0,77 |
| Relaxed | 0,03 | -0,45 to | 0,52 |
| **Vigorous** | **0,87** | **0,31 to** | **1,44** |
| Rested | 0,26 | -0,35 to | 0,86 |
| **Interesting** | **1,15** | **0,61 to** | **1,69** |
| 55-64 | **Happy** | **0,79** | **0,27 to** | **1,31** |
| Relaxed | 0,40 | -0,24 to | 1,03 |
| **Vigorous** | **1,23** | **0,67 to** | **1,79** |
| **Rested** | **1,25** | **0,65 to** | **1,86** |
| **Interesting** | **1,85** | **1,28 to** | **2,42** |
| 65-74 | **Happy** | **0,58** | **0,13 to** | **1,04** |
| Relaxed | -0,16 | -0,57 to | 0,26 |
| **Vigorous** | **1,15** | **0,52 to** | **1,78** |
| Rested | 0,07 | -0,47 to | 0,60 |
| **Interesting** | **1,44** | **0,92 to** | **1,97** |
| 75+ | Happy | 0,59 | -0,21 to | 1,39 |
| Relaxed | 0,26 | -0,53 to | 1,05 |
| **Vigorous** | **1,06** | **0,32 to** | **1,80** |
| Rested | -0,15 | -0,93 to | 0,63 |
| **Interesting** | **1,40** | **0,60 to** | **2,20** |

Bold text marks statistically significant difference with a p-value <0.05.

**SUPPLEMENTARY FIGURE 6.** Symptoms of anxiety and depression at wave one to five of the CCDPS 2020, stratified by age.



**SUPPLEMENTARY TABLE 5.** Difference in symptoms of anxiety and depression from wave four to five of the CCDPS 2020. Stratified by age.

|  |  |  |  |
| --- | --- | --- | --- |
| **Age** | **Items** | **Difference in mean score** | **95% CI** |
| 18-24 | Worried | 0.06 | -0.61 to | 0.73 |
| Nervous | -0.16 | -0.92 to | 0.59 |
| Anxious | -0.26 | -0.94 to | 0.41 |
| Depressed | -0.54 | -1.36 to | 0.28 |
| **Hopeless** | **-0.93** | **-1.75 to** | **-0.11** |
| Guilty | 0.21 | -0.57 to | 1.00 |
| 25-34 | Worried | -0.17 | -0.62 to | 0.28 |
| Nervous | -0.12 | -0.55 to | 0.32 |
| Anxious | -0.11 | -0.52 to | 0.29 |
| **Depressed** | **-0.58** | **-1.00 to** | **-0.16** |
| **Hopeless** | **-0.61** | **-1.06 to** | **-0.16** |
| Guilty | -0.19 | -0.55 to | 0.17 |
| 35-44 | Worried | -0.35 | -0.78 to | 0.08 |
| Nervous | -0.11 | -0.51 to | 0.30 |
| Anxious | -0.14 | -0.49 to | 0.22 |
| **Depressed** | **-0.50** | **-0.92 to** | **-0.09** |
| **Hopeless** | **-0.49** | **-0.90 to** | **-0.07** |
| Guilty | 0.09 | -0.26 to | 0.45 |
| 45-54 | Worried | -0.28 | -0.61 to | 0.04 |
| Nervous | -0.23 | -0.52 to | 0.05 |
| **Anxious** | **-0.27** | **-0.52 to** | **-0.01** |
| **Depressed** | **-0.42** | **-0.72 to** | **-0.12** |
| **Hopeless** | **-0.49** | **-0.79 to** | **-0.18** |
| Guilty | -0.08 | -0.36 to | 0.21 |
| 55-64 | **Worried** | **-0.78** | **-1.12 to** | **-0.44** |
| Nervous | -0.25 | -0.54 to | 0.03 |
| **Anxious** | **-0.36** | **-0.62 to** | **-0.10** |
| **Depressed** | **-0.53** | **-0.84 to** | **-0.22** |
| **Hopeless** | **-0.41** | **-0.73 to** | **-0.09** |
| Guilty | 0.15 | -0.12 to | 0.41 |
| 65-74 | **Worried** | **-0.78** | **-1.08 to** | **-0.49** |
| Nervous | -0.15 | -0.42 to | 0.11 |
| **Anxious** | **-0.43** | **-0.67 to** | **-0.20** |
| **Depressed** | **-0.28** | **-0.54 to** | **-0.02** |
| **Hopeless** | **-0.47** | **-0.73 to** | **-0.21** |
| Guilty | 0.08 | -0.12 to | 0.29 |
| 75+ | **Worried** | **-1.12** | **-1.60 to** | **-0.64** |
| **Nervous** | **-0.59** | **-1.02 to** | **-0.16** |
| **Anxious** | **-0.58** | **-1.02 to** | **-0.15** |
| **Depressed** | **-0.62** | **-1.08 to** | **-0.15** |
| **Hopeless** | **-0.86** | **-1.38 to** | **-0.33** |
| Guilty | -0.15 | -0.42 to | 0.12 |

Bold text marks statistically significant difference with a p-value <0.05.

**SUPPLEMENTARY TABLE 6.** Correlation between changes in symptoms of anxiety/depression and changes in psychological well-being (WHO-5 total scores) from wave four to wave five of the CCDPS 2020.

|  |  |  |
| --- | --- | --- |
| **Age (years)** | **Symptom** | **Pearson’s R** |
| 18-24 | **Worried** | **-0.47 (p=0.004)** |
| **Nervous** | **-0.60 (p<0.001)** |
| **Anxious** | **-0.52 (p=0.001)** |
| **Depressed** | **-0.60 (p<0.001)** |
| **Hopeless** | **-0.67 (p<0.001)** |
| **Guilty** | **-0.37 (p=0.006)** |
| 25-34 | **Worried** | **-0.50 (p<0.001)** |
| **Nervous** | **-0.27 (p=0.004)** |
| **Anxious** | **-0.36 (p<0.001)** |
| **Depressed** | **-0.51 (p<0.001)** |
| **Hopeless** | **-0.51 (p<0.001)** |
| **Guilty** | **-0.41 (p<0.001)** |
| 35-44 | **Worried** | **-0.50 (p<0.001)** |
| **Nervous** | **-0.39 (p<0.001)** |
| **Anxious** | **-0.40 (p<0.001)** |
| **Depressed** | **-0.55 (p<0.001)** |
| **Hopeless** | **-0.53 (p<0.001)** |
| **Guilty** | **-0.25 (p=0.006)** |
| 45-54 | **Worried** | **-0.46 (p<0.001)** |
| **Nervous** | **-0.45 (p<0.001)** |
| **Anxious** | **-0.36 (p<0.001)** |
| **Depressed** | **-0.51 (p<0.001)** |
| **Hopeless** | **-0.46 (p<0.001)** |
| **Guilty** | **-0.24 (p<0.001)** |
| 55-64 | **Worried** | **-0.42 (p<0.001)** |
| **Nervous** | **-0.39 (p<0.001)** |
| **Anxious** | **-0.32 (p<0.001)** |
| **Depressed** | **-0.46 (p<0.001)** |
| **Hopeless** | **-0.40 (p<0.001)** |
| **Guilty** | **-0.20 (p=0.013)** |
| 65-74 | **Worried** | **-0.40 (p<0.001)** |
| **Nervous** | **-0.47 (p<0.001)** |
| **Anxious** | **-0.36 (p<0.001)** |
| **Depressed** | **-0.48 (p<0.001)** |
| **Hopeless** | **-0.36 (p<0.001)** |
| **Guilty** | **-0.25 (p=0.003)** |
| 75+ | Worried | -0.15 (p=0.227) |
| **Nervous** | **-0.28 (p=0.005)** |
| Anxious | -0.18 (p=0.117) |
| **Depressed** | **-0.24 (p=0.012)** |
| **Hopeless** | **-0.28 (p<0.001)** |
| Guilty | -0.15 (p=0.177) |

Pearson's correlation coefficients for the association between changes in the six self-reported symptoms of anxiety and depression from wave 4 to wave 5 and changes in WHO-5 total scores from wave 4 to wave 5 of the CCDPS 2020. Observations: 63-276. Bold text marks statistically significant correlation with a p-value<0.05.

**References**

1. Nielsen L, Hinrichsen C, Santini ZI, Koushede V. The Danish Mental Health and Well-Being Survey 2016. Statens Institut for Folkesundhed, Copenhagen, Denmark. 2017.