**Supplemental material – S1.** Sample characteristics and distributions of variables in the study

**Table S1.1.** Sample characteristics (N=888)

| **Variables**  | **Frequency** | **Percent** |
| --- | --- | --- |
| **Age**  |  |  |
| Under 35 | 58 | 6.53 |
| 35-44 | 116 | 13.06 |
| 45-54 | 291 | 32.77 |
| 55-64 | 229 | 25.79 |
| 65 or above | 164 | 18.47 |
| Missing  | 30 | 3.38 |
| **Gender**  |  |  |
| Men | 287 | 32.32 |
| Women | 554 | 62.39 |
| Missing | 47 | 5.29 |
| **Birthplace** |  |  |
| Mainland China | 810 | 91.22 |
| Other | 47 | 5.29 |
| Missing | 31 | 3.49 |
| **Language**  |  |  |
| Mandarin | 790 | 88.96 |
| Other | 63 | 7.09 |
| Missing | 35 | 3.94 |
| **Province** |  |  |
| Ontario | 759 | 85.47 |
| Other | 95 | 10.70 |
| Missing | 34 | 3.83 |
| **Length in Canada** |  |  |
| Under 6 years | 91 | 10.25 |
| 6 to less than 15 years | 269 | 30.29 |
| At least 15 years | 495 | 55.74 |
| Missing  | 33 | 3.72 |
| **Marital status** |  |  |
| Married/Common law | 735 | 82.77 |
| Other  | 120 | 13.51 |
| Missing | 33 | 3.72 |
| **Living status** |  |  |
| With family | 758 | 85.36 |
| Other | 83 | 9.35 |
| Missing | 47 | 5.29 |
| **Highest educational status** |  |  |
| Under university  | 201 | 22.64 |
| University  | 371 | 41.78 |
| Master/PhD | 284 | 31.98 |
| Missing | 32 | 3.60 |
| **Employment status** |  |  |
| Employed | 351 | 39.53 |
| Self-employed | 160 | 18.02 |
| Unemployed | 116 | 13.06 |
| Other  | 229 | 25.79 |
| Missing  | 32 | 3.60 |
| **Work in healthcare** |  |  |
| Yes | 71 | 8.00 |
| No | 766 | 86.26 |
| Missing | 51 | 5.74 |
| **Work requiring public contact** |  |  |
| Yes | 147 | 16.55 |
| No | 691 | 77.82 |
| Missing | 50 | 5.63 |
| **Financial status** |  |  |
| Dissatisfied  | 197 | 22.18 |
| Neutral | 344 | 38.74 |
| Satisfied  | 299 | 33.67 |
| Missing  | 48 | 5.41 |
| **Health status** |  |  |
| Poor | 41 | 4.62 |
| Fair | 336 | 37.84 |
| Good | 452 | 50.90 |
| Missing | 59 | 6.64 |
| **Covid-19 infectious history** |  |  |
| Yes | 4 | 0.45 |
| No | 884 | 99.55 |
| **Fear of Covid-19** |  |  |
| Yes | 568 | 63.96 |
| No | 214 | 24.10 |
| Missing | 106 | 11.94 |
| **Discriminate** |  |  |
| Perceived/experienced | 320 | 36.04 |
| No | 506 | 56.98 |
| Missing | 62 | 6.98 |
| **Delay** |  |  |
| Yes | 634 | 71.40 |
| Non-response about delay | 254 | 28.60 |
| **CPDI** |  |  |
| Normal (<28) | 419  | 47.18 |
| Mild to severe (≥28) | 327 | 36.82 |
| Missing | 142 | 15.99 |
| **Social Loneliness Score** |  |  |
| Observed | 730 |  |
| Mean ± SD | 17.45 ± 3.19 |  |
| MissingAbbreviations: Delay. Delayed access to treatment/health assessment; CPDI. COVID-19 Peritraumatic Distress Index; SD, Standard deviation | 158 |  |

**Supplemental material – S2. Selection models and sensitivity analysis**

We used proc hpgenselect with selection method = lasso (choose=aic stop=aic) to select the best variables for the final model.

From the output for 20 selected models, we decided to exclude working requiring public contact variable in the model based on the frequency of selection and coefficient strength. **Table S2.1** presents variables selected across 20 imputed datasets. Eight variables: (a) age, (b) length in Canada, (c) highest educational status, (d) financial status, (e) fear of Covid-19, (f) delay, (g) social loneliness score, and (h) current health status chosen in most models are appropriate variables for the final model. Working requiring public contact were chosen in five models, which might indicate its lower consistency across imputed datasets. Regarding coefficient strength, the coefficient magnitude of working requiring public contact is significantly lower than that of other variables, suggesting that this variable had a lower impact on the final model compared to other variables. Moreover, we examined the final models with and without working requiring public contact (**Table S2.2**). There are no differences between two models.

**Table S2.1.** Model selection from logistic LASSO regression with imputed data

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fit statistics** | **Imputed****1** | **Imputed****2** | **Imputed****3** | **Imputed****4** | **Imputed****5** | **Imputed****6** | **Imputed****7** | **Imputed****8** | **Imputed****9** | **Imputed 10** |
| AIC | 812.84 | 812.42 | 812.01 | 809.15 | 806.12 | 810.14 | **805.60** | 812.83 | 809.77 | 813.03 |
| BIC | 854.37 | 858.57 | 853.54 | 855.29 | 847.65 | 851.68 | **847.13** | 854.37 | 851.30 | 854.56 |
| **Variables** | **Parameter estimates** |
| Age | 0.1006 | 0.1016 | 0.1047 | 0.1085 | 0.1114 | 0.1080 | 0.1080 | 0.1016 | 0.1068 | 0.1030 |
| Length in Canada | 0.0810 | 0.0852 | 0.0788 | 0.0892 | 0.0863 | 0.0848 | 0.0892 | 0.0795 | 0.0885 | 0.0931 |
| Highest educational status | 0.0453 | 0.4723 | 0.0485 | 0.0520 | 0.0547 | 0.0507 | 0.0540 | 0.0444 | 0.0471 | 0.0499 |
| Financial status | 0.1247 | 0.1240 | 0.1369 | 0.1206 | 0.1159 | 0.1166 | 0.1183 | 0.1284 | 0.1214 | 0.1154 |
| Fear of Covid-19 | 0.6783 | 0.6715 | 0.6433 | 0.6749 | 0.6714 | 0.6648 | 0.6828 | 0.6618 | 0.6646 | 0.6795 |
| Delay | 0.2122 | 0.2191 | 0.1936 | 0.2206 | 0.2271 | 0.2253 | 0.2228 | 0.2235 | 0.2243 | 0.2262 |
| Social Loneliness Score | -0.3257 | - 0.3280 | -0.3256 | -0.3328 | -0.3334 | -0.3295 | -0.3331 | -0.3255 | -0.3291 | -0.3217 |
| Work requiring public contact | - | 0.0027 | - | 0.0037 | - | - | - | - | - | - |
| Current health status | 0.0144 | 0.0090 | 0.0155 | 0.0121 | 0.0117 | 0.0131 | 0.0052 | 0.0077 | 0.0046 | 0.0122 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fit statistics** | **Imputed****11** | **Imputed****12** | **Imputed****13** | **Imputed****14** | **Imputed****15** | **Imputed****16** | **Imputed****17** | **Imputed****18** | **Imputed****19** | **Imputed 20** |
| AIC | 807.07 | 808.00 | 805.86 | 810.61 | 808.65 | 809.62 | 808.80 | 807.97 | 808.78 | 808.63 |
| BIC | 848.60 | 849.53 | 847.40 | 852.14 | 850.10 | 855.77 | 854.95 | 849.50 | 843.70 | 854.78 |
| **Variables** | **Parameter estimates** |
| Age | 0.1075 | 0.1105 | 0.1151 | 0.1071 | 0.1086 | 0.1059 | 0.1104 | 0.1062 | 0.1058 | 0.1112 |
| Length in Canada | 0.0924 | 0.0852 | 0.0936 | 0.0852 | 0.0818 | 0.0896 | 0.0896 | 0.0830 | 0.0855 | 0.0815 |
| Highest educational status | 0.0535 | 0.0535 | 0.0572 | 0.0522 | 0.0431 | 0.0449 | 0.0537 | 0.0513 | 0.0445 | 0.0542 |
| Financial status | 0.1194 | 0.1196 | 0.1234 | 0.1231 | 0.1323 | 0.1212 | 0.1166 | 0.1297 | 0.1222 | 0.1279 |
| Fear of Covid-19 | 0.6898 | 0.6695 | 0.6862 | 0.6679 | 0.6713 | 0.6735 | 0.6794 | 0.6695 | 0.6613 | 0.6758 |
| Delay | 0.2274 | 0.2308 | 0.2303 | 0.2264 | 0.2176 | 0.2201 | 0.2217 | 0.2204 | 0.2208 | 0.2240 |
| Social Loneliness Score | -0.3276 | -0.3324 | -0.3302 | -0.3291 | -0.3292 | -0.3308 | -0.3326 | -0.3306 | -0.3317 | -0.3328 |
| Work requiring public contact | - | - | - | - | - | 0.0022 | 0.0030 | - | - | 0.0014 |
| Current health status | 0.0091 | 0.0131 | 0.0101 | 0.0066 | 0.0060 | 0.0111 | 0.0075 | 0.0028 | - | 0.0052 |

Abbreviations: Delay. Delayed access to treatment/health assessment; AIC, Akaike information criterion; BIC, Bayesian information criterion

**Table S2.2.** Multivariate logistic regression

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Completed cases analysis** |  | **Imputed cases analysisa** |  | **Imputed cases analysisb** |
|  | OR | 95% CI | p-value |  | OR | 95% CI | p-value |  | OR | 95% CI  | p-value |
| **Age**  |  |  |  |  |  |  |  |  |  |  |  |
| Under 35 | 1.946 | 0.858 – 4.411 | 0.3016 |  | 1.317 | 0.734 – 2.363 | 0.3551 |  | 1.301 | 0.726 - 2.332 | 0.3770 |
| 35-44 | 1.534 | 0.802 – 2.934 | 0.7602 |  | 1.111 | 0.723 – 1.706 | 0.6307 |  | 1.108 | 0.720 - 1.704 | 0.6418 |
| 45-54 | 1.510 | 0.897 – 2.540 | 0.7458 |  | 1.065 | 0.780 – 1.455 | 0.6899 |  | 1.067 | 0.781 - 1.458 | 0.6823 |
| 55-64 | 1.343 | 0.771 – 2.339 | 0.7201 |  | 0.952 | 0.666 – 1.361 | 0.7867 |  | 0.948 | 0.663 - 1.355 | 0.7678 |
| 65 or above | ref |  |  |  | ref |  |  |  | ref |  |  |
| **Length in Canada** |  |  |  |  |  |  |  |  |  |  |  |
| Under 6 years | 1.339 | 0.771 – 2.339 | 0.6733 |  | 1.108 | 0.759 – 1.616 | 0.5961 |  | 1.110 | 0.761 - 1.621 | 0.5875 |
| 6 to less than 15 years | 1.403 | 0.924 – 2.129 | 0.3770 |  | 1.120 | 0.844 – 1.486 | 0.4307 |  | 1.119 | 0.843 - 1.485 | 0.4372 |
| At least 15 years | ref |  |  |  | ref |  |  |  | ref |  |  |
| **Highest educational status** |  |  |  |  |  |  |  |  |  |  |  |
| Under university  | 1.303 | 0.793 – 2.143 | 0.2299 |  | 1.170 | 0.880 – 1.556 | 0.2797 |  | 1.158 | 0.870 - 1.542 | 0.3133 |
| University  | 0.999 | 0.661 – 1.510 | 0.4690 |  | 0.943 | 0.743 – 1.196 | 0.6263 |  | 0.945 | 0.744 - 1.199 | 0.6414 |
| Master/PhD | ref |  |  |  | ref |  |  |  | ref |  |  |
| **Financial status** |  |  |  |  |  |  |  |  |  |  |  |
| Dissatisfied  | 1.314 | 0.803 – 2.150 | 0.3736 |  | 1.133 | 0.852 – 1.507 | 0.3910 |  | 1.136 | 0.854 - 1.511 | 0.3809 |
| Neutral | 1.168 | 0.776 – 1.758 | 0.9176 |  | 1.004 | 0.792 – 1.272 | 0.9757 |  | 1.000 | 0.789 - 1.267 | 1.0000 |
| Satisfied  | ref |  |  |  | ref |  |  |  | ref |  |  |
| **Fear of Covid-19** |  |  |  |  |  |  |  |  |  |  |  |
| Yes | 2.617 | 1.694 – 4.041 | <.0001 |  | 1.604 | 1.293 – 1.989 | <.0001 |  | 1.605 | 1.294 - 1.991 | <.0001 |
| No | ref |  |  |  | ref |  |  |  | ref |  |  |
| **Delay** |  |  |  |  |  |  |  |  |  |  |  |
| Yes | 1.900 | 1.184 – 3.048 | 0.0078 |  | 1.362 | 1.078 – 1.720 | 0.0095 |  | 1.357 | 1.075 - 1.715 | 0.0103 |
| Non-response about delay | ref |  |  |  | ref |  |  |  | ref |  |  |
| **Social Loneliness Score** | 1.384 | 1.291 – 1.483 | <.0001 |  | 1.408 | 1.314 – 1.508 | <.0001 |  | 1.406 | 1.313 - 1.507 | <.0001 |
| **Work requiring public contact** |  |  |  |  |  |  |  |  | ref |  |  |
| Yes | 1.245 | 0.782 – 1.982 | 0.3563 |  | - | - | - |  | 1.109 | 0.879 - 1.400 | 0.3816 |
| No | ref |  |  |  | - | - | - |  | ref |  |  |
| **Current health status** |  |  |  |  |  |  |  |  |  |  |  |
| Poor | - | - | - |  | 1.529 | 0.815 – 2.869 | 0.1860 |  | 1.505 | 0.803 - 2.820 | 0.2022 |
| Fair | - | - | - |  | 0.782 | 0.544 – 1.124 | 0.1838 |  | 0.789 | 0.549 - 1.134 | 0.2008 |
| Good | - | - | - |  | ref |  |  |  | ref |  |  |

a. The final multivariate logistic regression model contain age, length in Canada, highest educational status, financial status, fear of Covid-19, delay, social loneliness score, and current health status.

b. The final multivariate logistic regression model contain age, length in Canada, highest educational status, financial status, fear of Covid-19, delay, social loneliness score, working requiring public contact, and current health status.

Abbreviations: Delay. Delayed access to treatment/health assessment; CPDI. COVID-19 Peritraumatic Distress Index; 95% CI. 95% Confidence interval; OR, Odd ratios

**Table S3.3.** Check goodness-of-fit and ROC across unimputed and imputed models.

**Table S2.3.** Goodness-of-fit of the models

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Unimputed****dataset** | **Imputed****1** | **Imputed****2** | **Imputed****3** | **Imputed****4** | **Imputed****5** | **Imputed****6** | **Imputed****7** | **Imputed****8** | **Imputed****9** | **Imputed 10** |
| Hosmer & Lemeshow Goodness-of-Fit Testa | 0.5027 | 0.8316 | 0.8096 | 0.8010 | 0.6006 | 0.3361 | 0.4058 | 0.3859 | 0.6962 | 0.4555 | 0.8546 |
| ROC curveb | 0.7960 | 0.8061 | 0.8072 | 0.8067 | 0.8087 | 0.8090 | 0.8070 | 0.8096 | 0.8057 | 0.8067 | 0.8-58 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Imputed****11** | **Imputed****12** | **Imputed****13** | **Imputed****14** | **Imputed****15** | **Imputed****16** | **Imputed****17** | **Imputed****18** | **Imputed****19** | **Imputed 20** |
| Hosmer & Lemeshow Goodness-of-Fit Testa | 0.4830 | 0.4766 | 0.3833 | 0.6913 | 0.2882 | 0.7156 | 0.4404 | 0.5662 | 0.5688 | 0.3627 |
| ROC curveb | 0.8088 | 0.8080 | 0.8090 | 0.8065 | 0.8080 | 0.8089 | 0.8089 | 0.8081 | 0.8075 | 0.8089 |

a. p-value > 0.05 indicates that the model has a goodness-of-fit. (David et al. (2013), p 165)

b. Area Under the Receiver Operating Characteristics Curve indicates the ability of the fitted model to discriminate between individuals with and without outcome of interest (David et al. (2013), p.174-178)

* 0.7 ≤ ROC < 0.8: indicates an acceptable discrimination.
* 0.8 ≤ ROC < 0.9: indicates an excellent discrimination.

**References**

Hosmer D.W., Lemeshow S., & Sturdivant R.X. (2013, April). Applied Logistic Regression. John Wiley & Sons. ISBN: 978-0-470-58247-3