**SUPPLEMENTARY TABLES**

**Supplementary Table 1.**

WMH-ICS sample characteristics.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Number of participating universities** | **Total size of the universities** | **Number of first-year students eligible** | **Number of first-year students participated** | **Response Rate** | **Survey Field Dates** | **Sampling and procedures** |
| **Australia** | 1 public | ~ 45,000 | 13,752 | 1,202 | 8.7% | 2016-17 | All first-year students were invited to participate through e-mail. Five reminder emails were sent with personalized links to the survey. Conditional incentives were applied (movie passes). |
| **Belgium** | 1 public | ~ 45,000 | 13,103 | 5,844 | 44.6% | 2014-17 | All first-year students between 2014-2016 were invited for a psycho-medical check-up in the student mental health center. Surveys were completed in the waiting room. Students who did not show up for the psycho-medical check-up received up to eight reminder emails. Conditional incentives were applied (store credit coupons). In 2016-2017, all first-year students were invited to participate through e-mail (up to eight emails). |
| **Germany** | 2 public | ~ 40,000 | 11,210 | 1,757 | 15.7% | 2016-18 | All first-year students were invited to participate through e-mail. Six reminder emails were sent with personalized links to the survey. Conditional incentives were applied (store credit coupons). |
| **Hongkong** | 1 public | ~ 3,000 | 519 | 208 | 40.1% | 2017 | All first-year full-time students were invited to participate through email and campus posters with QR codes for electronically registering for participation by providing university email address. After verification by university research team of the email addresses being provided, individual survey links were sent to the students. Up to 5 reminder emails, each 1 week apart, were sent for non-responding or incomplete surveys. All respondents who completed surveys were given HKD100 (=USD 12.8) shopping coupons as incentives. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Mexico** | 5 private/4 public | ~ 28,000 | 10,747 | 8,076 | 75.1% | 2016-18 | All first-year students were eligible for the survey. Initial contact differed by university: survey included in an obligatory health evaluation (2 universities), as part of obligatory group tutoring sessions (1 university), or as part of required classes (3 universities) or teacher evaluations (2 universities) and direct invitations from university administrators (1). Two universities sent reminder emails (tutors sent out emails to their tutees; in a required class of personal development, reminders were sent out by faculty). No incentives were applied for baseline surveys. |
| **Northern- Ireland** | 1 public | ~ 25,000 | 4,359 | 739 | 17.0% | 2015 | All first-year students due to register were invited to participate. Following registration, ID numbers and links to the survey were provided. Five reminder emails/text messages were sent with personalized links to the survey. A 6th reminder involved a researcher telephoning non-responders. All responders were entered into a number of draws to win an iPad. |
| **South-Africa** | 1 public | ~ 30,000 | 5,338 | 686 | 12.9% | 2015 | All first-year students were invited to participate through e-mail. Eight reminder emails and one text message were sent with personalized links to the survey. Conditional incentives were applied (5x R1000 draw). |
| **Spain** | 5 public | ~ 96,000 | 16,332 | 2,118 | 13.0% | 2014-15 | All first-year students were eligible for the survey. Initial contact differed by university (information stands, information sessions in classrooms, through the university's website). Four reminder emails were sent with personalized links to the survey. Conditional monetary incentives were applied. Additionally, an end-game strategy was implemented by selecting a random proportion of non-respondents and offering all of them a monetary incentive. |
| **United States** | 3 private | ~ 21,800 | 4,382 | 739 | 16.9% | 2015-16 | All first-year students were invited to participate through e-mail. Three reminder emails were sent with personalized links to the survey. Conditional incentives were applied (gift cards). |
| **Total** | 8 private/ 16 public | ~ 333,800 | 79,746 | 21,369 | 45.6%\* | 2014-18 |  |

Note: \* weighted by achieved sample size.

**Supplementary Table 2.**

Associations between sociodemographic characteristics and non-suicidal self-injury in the WMH-ICS.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Predictor distributiona | **Onset:**  Lifetime NSSIb among entire sample | **Recency Model1**:  12-month NSSIc among sample with lifetime NSSI | **Recency Model2:**  12-month NSSIc among sample with lifetime NSSI | **Severity Model1:**  5+ frequency criteriond among sample with 12-month NSSI | **Severity Model2:**  5+ frequency criteriond among sample with 12-month NSSI |
|  | %(SE) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) |
| Being female | 54.7 (0.4) | 1.6 (1.4-1.7)\* | 0.8 (0.7-1.0)\* | 0.8 (0.7-1.0)\* | 1.3 (1.0-1.7)\* | 1.3 (1.0-1.6) |
| Age at interview 18 | 57.6 (0.4) | (ref) | (ref) | - | (ref) | - |
| Age at interview 19 | 24.6 (0.3) | 1.0 (0.9-1.1) | 1.1 (0.9-1.4) | - | 0.8 (0.6-1.1) | - |
| Age at interview 20+ | 17.8 (0.3) | 0.8 (0.7-0.9)\* | 0.9 (0.7-1.1) | - | 0.9 (0.6-1.2) | - |
| F(ndf,ddf)[p value]e |  | 10.63(2,5260) [0.00]\* | 2.32(2,35399) [0.10] |  | 1.01(2,207638) [0.36] |  |
| Parental education high | 55.9 (0.5) | (ref) | (ref) | (ref) | (ref) | (ref) |
| Parental education medium | 25.1 (0.4) | 1.1 (0.9-1.2) | 0.9 (0.8-1.2) | 0.9 (0.8-1.2) | 0.9 (0.6-1.2) | 0.9 (0.6-1.3) |
| Parental education low | 19.0 (0.4) | 1.0 (0.9-1.1) | 0.7 (0.6-0.9)\* | 0.7 (0.6-0.9)\* | 0.9 (0.6-1.3) | 0.9 (0.6-1.3) |
| F(ndf,ddf)[p value]e |  | 0.47(2,150) [0.63] | 4.78(2,211) [0.01]\* | 4.61(2,197) [0.01]\* | 0.58(2,224) [0.56] | 0.50(2,198) [0.61] |
| Parents not married or parent(s) deceased | 24.6 (0.4) | 1.2 (1.1-1.3)\* | 0.9 (0.7-1.1) | 0.9 (0.7-1.1) | 1.1 (0.8-1.5) | 1.1 (0.8-1.5) |
| Christian | 70.6 (0.4) | (ref) | (ref) | (ref) | (ref) | (ref) |
| No religion | 25.2 (0.4) | 1.4 (1.3-1.6)\* | 1.2 (1.0-1.5)\* | 1.2 (1.0-1.5) | 1.3 (0.9-1.7) | 1.3 (1.0-1.7) |
| Another religion | 4.2 (0.2) | 1.3 (1.1-1.6)\* | 1.3 (0.9-1.8) | 1.3 (0.9-1.9) | 1.2 (0.7-2.2) | 1.2 (0.7-2.2) |
| F(ndf,ddf)[p value]e |  | 23.16(2,139) [0.00]\* | 2.64(2,224)  [0.07] | 2.33(2,221) [0.10] | 1.44(2,426) [0.24] | 1.65(2,392) [0.19] |
| Heterosexual - not attracted to same gender | 76.2 (0.4) | (ref) | (ref) | (ref) | (ref) | (ref) |
| Heterosexual - somewhat or more attracted to same gender | 12.7 (0.3) | 2.0 (1.8-2.2)\* | 1.1 (0.9-1.4) | 1.1 (0.9-1.4) | 1.3 (0.9-1.8) | 1.3 (0.9-1.9) |
| Non-heterosexual - no same-gender sex | 6.9 (0.2) | 2.7 (2.4-3.1)\* | 2.1 (1.7-2.8)\* | 2.1 (1.7-2.8)\* | 1.6 (1.1-2.3)\* | 1.6 (1.1-2.3)\* |
| Non-heterosexual and/or same-gender sex | 4.2 (0.2) | 2.9 (2.5-3.3)\* | 1.7 (1.2-2.4)\* | 1.7 (1.2-2.4)\* | 1.6 (1.0-2.5)\* | 1.6 (1.0-2.6)\* |
| F(ndf,ddf)[p value]e |  | 119.90(3,112) [0.00]\* | 13.76(3,198) [0.00]\* | 13.59(3,188) [0.00]\* | 2.95(3,228) [0.03]\* | 3.03(3,237) [0.03]\* |
| Self-reported ranking high school top 10% | 46.4 (0.4) | - | (ref) | (ref) | (ref) | (ref) |
| Self-reported ranking high school top 30% to 10% | 29.2 (0.4) | - | 1.1 (0.9-1.3) | 1.1 (0.9-1.3) | 0.9 (0.7-1.2) | 0.9 (0.7-1.2) |
| Self-reported ranking high school bottom 70% | 24.4 (0.4) | - | 1.1 (0.9-1.3) | 1.1 (0.9-1.3) | 1.3 (0.9-1.8) | 1.3 (0.9-1.8) |
| F(ndf,ddf)[p value]e |  |  | 0.30(2,699)  [0.74] | 0.29(2,700) [0.75] | 2.41(2,289) [0.09] | 2.35(2,269) [0.10] |
| NSSI onset 11 or younger | 17.9 (0.7) | - | - | (ref) | - | (ref) |
| NSSI onset ages 12-14 | 36.5 (0.8) | - | - | 0.7 (0.5-1.0)\* | - | 0.8 (0.5-1.3) |
| NSSI onset ages 15-17 | 37.9 (0.8) | - | - | 0.6 (0.4-0.9)\* | - | 0.6 (0.3-1.1) |
| NSSI onset ages 18-19 | 6.6 (0.5) | - | - | 1.0 (0.6-1.7) | - | 0.3 (0.2-0.8)\* |
| NSSI onset ages 20 or older | 1.1 (0.2) | - | - | 0.6 (0.3-1.3) | - | 0.3 (0.1-1.3) |
| F(ndf,ddf)[p value]e |  |  |  | 3.58(4,26199) [0.01]\* |  | 1.82(4,45002) [0.12] |
| NSSI onset 8 or more years ago | 20.0 (0.7) | - | (ref) | (ref) | (ref) | (ref) |
| NSSI onset 6-7 years ago | 18.8 (0.7) | - | 0.8 (0.6-1.0) | 1.0 (0.7-1.3) | 0.5 (0.4-0.8)\* | 0.6 (0.4-1.0)\* |
| NSSI onset 4-5 years ago | 26.6 (0.8) | - | 0.8 (0.7-1.1) | 1.1 (0.8-1.5) | 0.6 (0.5-0.9)\* | 0.9 (0.5-1.4) |
| NSSI onset 2-3 years ago | 24.9 (0.7) | - | 1.0 (0.8-1.2) | 1.5 (1.0-2.1)\* | 0.4 (0.3-0.6)\* | 0.7 (0.4-1.2) |
| NSSI onset year before college | 9.7 (0.5) | - | 4.1 (2.9-5.6)\* | 5.0 (3.2-7.8)\* | 0.3 (0.2-0.5)\* | 0.7 (0.4-1.5) |
| F(ndf,ddf)[p value]e |  |  | 28.33(4,64406) [0.00]\* | 17.69(4,78378) [0.00]\* | 9.07(4,26568) [0.00]\* | 1.57(4,57157) [0.18] |

Note: a estimates among entire sample except for age-of-onset and time since onset of NSSI, b NSSI at least once in lifetime, c NSSI at least once in past 12-months, d NSSI at least 5 times in past 12-months, e F-test to evaluate joint significance of categorical predictor levels across 20 imputed datasets. Each column displays the result of a separate multivariate model analyzed within a person-period survival (onset model) or person-level time-order (recency and severity models) framework, with all variables specified in the rows as predictors. All models control country membership and the onset model also controls person-year. Empty cells indicate the predictor specified in the row was not included in the model. The recency and severity model 1 include age and time since onset but exclude age-of-onset. The recency and severity model 2 include age-of-onset and time since onset but exclude age. NSSI = Non-Suicidal Self-Injury, ndf = numerator degrees of freedom, ddf = denominator degrees of freedom.

\*Significant at the .05 level, two-sided test.

**Supplementary Table 3**.

Multivariate associations between temporally prior non-suicidal self-injury and onset of DSM-IV mental disorders in the WMH-ICS.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Onset Major depressive disorder** | **Onset Generalized anxiety disorder** | **Onset Panic disorder** | **Onset Bipolar disorder** | **Onset Alcohol use disorder** | **Onset Drug use disorder** |
| **Temporally prior predictors** | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) |
| Non-suicidal self-injury | 1.3 (1.1-1.5)\* | 1.4 (1.3-1.6)\* | 1.7 (1.4-2.1)\* | 2.0 (1.6-2.5)\* | 1.8 (1.5-2.3)\* | 1.8 (1.5-2.3)\* |
| Major depressive disorder | - | 4.0 (3.5-4.6)\* | 3.0 (2.3-4.1)\* | - | 1.3 (1.0-1.6)\* | 2.1 (1.5-2.9)\* |
| Generalized anxiety disorder | 2.8 (2.4-3.2)\* | - | 4.4 (3.2-6.0)\* | 4.6 (3.7-5.7)\* | 1.3 (0.9-1.9) | 1.3 (0.8-2.3) |
| Panic disorder | 1.6 (1.0-2.4)\* | 3.9 (3.0-5.1)\* | - | 3.5 (2.1-5.9)\* | 1.7 (1.1-2.4)\* | 1.6 (1.1-2.5)\* |
| Bipolar disorder | - | 3.9 (3.1-4.9)\* | 3.8 (2.5-5.8)\* | - | 2.4 (1.8-3.2)\* | 2.6 (1.7-4.0)\* |
| Alcohol use disorder | 1.4 (1.0-2.0)\* | 2.3 (1.7-3.0)\* | 1.7 (1.0-2.9) | 3.1 (2.0-4.8)\* | - | 5.0 (3.7-6.7)\* |
| Drug use disorder | 1.3 (0.8-2.0) | 1.3 (0.9-2.0) | 1.5 (0.8-2.8) | 1.9 (1.1-3.3)\* | 2.3 (1.6-3.4)\* | - |
| **Number of temporally prior mental disorders** |  |  |  |  |  |  |
| None or exactly one mental disorder | (ref) | (ref) | (ref) | (ref) | (ref) | (ref) |
| Two or more mental disorders | 0.4 (0.2-0.7)\* | 0.5 (0.3-0.7)\* | 0.4 (0.2-0.5)\* | 0.5 (0.3-0.9)\* | 0.6 (0.4-1.0) | 0.7 (0.4-1.4) |

Note: Each column displays the result of a separate multivariate model within a person-period survival framework, with temporally prior non-suicidal self-injury and mental disorders in the table as predictors controlling for the following covariates: gender, age, education, marital status parents, religion, sexual orientation, and person-year (not shown here). \*Significant at the .05 level, two-sided test.

**Supplementary Table 4**.

Multivariate associations between temporally prior non-suicidal self-injury and recency of DSM-IV mental disorders in the WMH-ICS.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Recency Major depressive disorder** | **Recency Generalized anxiety disorder** | **Recency Panic disorder** | **Recency Bipolar disorder** | **Recency Alcohol use disorder** | **Recency**  **Drug use disorder** |
| **Temporally prior predictors** | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) | Multivariate aOR (95%CI) |
| Non-suicidal self-injury | 1.1 (0.7-1.5) | 1.6 (1.1-2.3)\* | 1.1 (0.4-2.8) | 4.6 (1.4-15.4)\* | 1.2 (0.6-2.5) | 1.0 (0.6-1.8) |
| Major depressive disorder | - | 1.0 (0.6-1.5) | 1.2 (0.3-4.4) | - | 1.5 (0.6-3.7) | 1.2 (0.6-2.6) |
| Generalized anxiety disorder | 1.0 (0.7-1.5) | - | 1.1 (0.3-4.2) | 0.9 (0.4-2.3) | 2.6 (0.9-7.3) | 1.0 (0.5-2.3) |
| Panic disorder | 1.8 (0.6-5.5) | 1.8 (0.6-4.8) | - | / | 1.2 (0.3-5.4) | 0.9 (0.4-2.4) |
| Bipolar disorder | - | 4.9 (1.2-19.1)\* | 2.2 (0.3-17.6) | - | 1.2 (0.5-3.3) | 1.6 (0.6-4.2) |
| Alcohol use disorder | 1.9 (0.6-5.9) | 0.9 (0.3-2.9) | / | 1.1 (0.2-6.1) | - | 1.8 (0.9-3.4) |
| Drug use disorder | 1.3 (0.4-4.2) | 1.6 (0.4-7.4) | 0.8 (0.1-5.0) | 0.3 (0.0-3.6) | 0.5 (0.2-1.4) | - |
| **Number of temporally prior mental disorders** |  |  |  |  |  |  |
| None or exactly one mental disorder | (ref) | (ref) | (ref) | (ref) | (ref) | (ref) |
| Two or more mental disorders | 1.1 (0.2-5.3) | 0.8 (0.2-3.4) | 0.5 (0.1-3.1) | 8.9 (0.7-112.8) | 0.5 (0.1-2.2) | 1.0 (0.3-3.1) |

Note: Each column displays the result of a separate multivariate model within a person-level time-order framework, with temporally prior non-suicidal self-injury and mental disorders in the table as predictors controlling for the following covariates: gender, age, education, marital status parents, religion, sexual orientation, and high-school ranking (except for panic disorder as the model did not converge), age-of-onset, and time since onset (not shown here). / effect could not be estimated.

\*Significant at the .05 level, two-sided test.