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Mental Health Disorders and Comorbid Substance Use Disorder as Risk Factors for Ophthalmic Trauma

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Abstract

Background/Objectives: Ophthalmic trauma is a leading cause of monocular blindness, yet psychosocial risk factors remain poorly characterised. We evaluated whether preexisting mental health disorders (MHD) and comorbid substance use disorder (SUD) raise the risk of ocular and orbital injury.

Subjects/Methods: Retrospective cohort study of de-identified records from 111 healthcare organisations in the TriNetX network, January 2010 to January 2025. Adults aged ≥ 18 with a documented general adult medical examination were identified by ICD-10 codes; those with prior ocular malignancy, major ocular surgery or the study outcomes were excluded. The primary analysis compared patients with MHD and comorbid SUD against patients with MHD alone; the secondary compared patients with MHD against matched controls, stratified by sex. After one-to-one propensity score matching, hazard ratios (HRs) with 95% confidence intervals (CIs) were calculated at 6 months, 1 year and 1.5 years.

Results: The substance use comparison matched 3.87 million patients per cohort, the sex stratified comparison 2.39 million males and 3.03 million females. At 1.5 years, comorbid SUD raised risk across all five categories, from HR 1.161 (95% CI 1.124–1.199) for corneal abrasion to 1.485 (1.170–1.885) for penetrating wound with foreign body. Preexisting MHD raised risk in both sexes at every interval, largest for contusion of eyeball and orbital tissue, 2.894 (2.640–3.173) in males and 2.643 (2.439–2.863) in females.

Conclusions: Preexisting MHD is associated with increased risk of ocular and orbital injury, and comorbid SUD confers additional risk. Screening and timely referral may reduce ocular injury burden in at-risk populations.

What was known before

Epidemiologic work on ocular trauma has focused on mechanism, occupation and demographics, and psychosocial risk factors have drawn far less attention. Mental illness raises injury risk in other organ systems, and alcohol and other substances are strongly tied to penetrating ocular trauma. Studies linking mental illness to eye trauma have been confined to single centres or single mechanisms, and most work has examined the psychiatric consequences of eye injury rather than the reverse.

What this study adds

In a propensity matched cohort drawn from 111 healthcare organisations, preexisting mental health disorders raised the risk of all five categories of ocular and orbital injury in both sexes and at every follow-up interval. Comorbid substance use disorder conferred risk beyond mental health disorder alone, with the largest increment for penetrating injury. The relative effect of a mental health disorder was similar in men and women despite higher absolute injury counts in men, which supports screening and referral in both sexes.

Introduction

Ocular trauma is a leading cause of monocular blindness and visual impairment worldwide. Global Burden of Disease estimates place the annual incidence near 60 million eye injuries, a burden that falls heaviest on working age adults.[1] In the United States, ophthalmic trauma drives more than 7 million emergency department visits per decade, and the injured population skews towards young, male, and lower income groups.[2] Contusions and corneal abrasions are the most common presentations, while open globe and penetrating injuries are rarer but cause most admissions and the greatest long term visual loss.[3,4]

Most epidemiologic work has focused on mechanism, occupation, and demographics. Psychosocial risk factors have drawn far less attention, even though mental illness is a well established driver of injury in other organ systems. Patients with psychiatric disorders carry a higher risk of traumatic brain injury, with reported odds roughly double that of the general population.[5] Population surveys show the same pattern across other injury types, where mood, anxiety, psychotic, and personality disorders all raise injury risk.[6] Severe mental illness magnifies this further. Meta analytic data showed that people with schizophrenia die from injury and accidents at roughly three times the general rate.[7] The eye itself is not spared. Self inflicted ocular injury, including self enucleation, occurs almost exclusively in the setting of untreated psychosis and severe psychiatric illness, and it produces devastating penetrating and orbital trauma.[8,9]

Substance use disorder adds a distinct and overlapping layer of ophthalmic risk. Alcohol and other substances are strongly tied to penetrating ocular trauma, including a large share of open globe injuries.[10] Alcohol associated eye injuries are far more likely to result from physical assault than injuries without alcohol involvement.[11] Because substance use disorder frequently coexists with mental health disorders (MHD), the two together may compound injury risk beyond either alone.

Prior research has mostly examined the reverse relationship, the psychiatric consequences of eye injury, and has typically excluded patients with preexisting psychiatric illness.[12] The smaller body of work linking mental illness to eye trauma itself has been confined to single centres or single mechanisms, such as personality disorders among patients with violent open globe injury.[13,14] No large scale study has examined whether preexisting mental health disorders, alone or with comorbid substance use, raise the risk of specific categories of ocular and orbital injury. We evaluated five injury categories across two arms. The first compared patients with MHD and comorbid substance use disorder against patients with MHD alone, which isolates the incremental contribution of substance use. The second compared patients carrying any qualifying MHD, defined to include substance use disorder (F10 to F19) together with psychotic, mood, anxiety and personality disorders, against matched controls within each sex.

Methods

This retrospective cohort study used data from TriNetX, a health research database with de-identified electronic medical records from 111 healthcare organisations worldwide. TriNetX is able to comply with the Health Insurance Portability and Accountability Act and receive a waiver from the Western Institutional Review Board by only providing cumulative counts of de-identified patient data. Informed consent was neither obtained nor required for this retrospective study as patients consented to provide their healthcare information to the TriNetX database while meeting their healthcare provider. This study was conducted in accordance with the principles of the Declaration of Helsinki. All diagnoses on the TriNetX medical database are classified by the International Classification of Diseases (ICD), Tenth Revision, Clinical Modification (ICD-10-CM) code set, which is a modified version of the World Health Organization ICD, Tenth Revision, standard. Current Procedural Terminology coding was also utilised during this study to minimise ICD-10-CM coding ambiguity. The data for this study were collected on May 20, 2026. The study analysed the database for electronic medical records from January 1, 2010, to January 1, 2025.

Study Sample

The eTable 1 provides the diagnostic codes for exclusion and inclusion criteria in our study. All included patients were required to be aged 18 years or older and to have an encounter for general adult medical examination without abnormal findings (ICD-10: Z00.00) between January 1, 2010, and January 1, 2025. Qualifying MHD diagnoses comprised mental and behavioural disorders due to psychoactive substance use (SUD) (ICD-10: F10-F19), schizophrenia, schizotypal, delusional, and other non-mood psychotic disorders (ICD-10: F20-F29), mood [affective] disorders (ICD-10: F30-F39), anxiety, dissociative, stress-related, somatoform and other non-psychotic mental disorders (ICD-10: F40-F48), and disorders of adult personality and behaviour (ICD-10: F60-F69). The first wing of this study compared patients who had a mental health disorder with comorbid SUD against patients who had a mental health disorder without SUD. The second wing compared patients with any qualifying MHD diagnosis against controls without these diagnoses, stratified by sex. We observed outcomes at 6 months, 1 year, and 1.5 years of follow-up. All patients were required to not have a malignant neoplasm of eye and adnexa, personal history of malignant neoplasm of the eye, prior cataract removal or corneal transplant, repair of retinal detachment, aqueous shunt procedures on anterior sclera of the eye, or fistulisation of the sclera for glaucoma. Both wings used the same general medical examination requirement and the same exclusion criteria. Figure 1a and 1b illustrate the inclusion and exclusion criteria for study wing 1 and wing 2, respectively.

Covariates

The TriNetX platform was utilised to conduct a 1:1 propensity score matching for characteristics and comorbidities to ensure balance between cohorts. Matching was performed using a greedy nearest-neighbour matching algorithm with a caliper of 0.1 standard deviation, a technical standard widely accepted in published literature[12]. The matched factors included age at index event, sex, race, and ethnicity. In TriNetX, propensity score matching is limited by cohort size. Thus, each cohort was checked

on diagnoses and family history risk factors (such as hypertension, body mass index, congenital malformations of eye, ear, face and neck, etc) to ensure standardised mean difference (SMD) < 0.1 prior to matching. This allowed propensity score matching to be limited to only the factors shown to have unequal SMD prior to matching.

Statistical Analyses

The index date of each patient was specified as the date the patient met all inclusion criteria. Age at index was defined by TriNetX as the age on the index date, and the ≥ 18-year filter was applied at cohort creation. The risk of injury of conjunctiva and corneal abrasion without foreign body (ICD-10: S05.0), contusion of eyeball and orbital tissue (ICD-10: S05.1), ocular laceration without prolapse or loss of intraocular tissue (ICD-10: S05.3), penetrating wound of orbit with or without foreign body (ICD-10: S05.4) and penetrating wound with foreign body (ICD-10: S05.5) were the primary outcomes measured in this study. Patients with documentation of primary outcomes prior to index event were excluded from the study. Hazard ratios (HRs) with their respective 95% confidence intervals (CIs) were generated using TriNetX univariable analyses. Consistent with established methodology for large-scale database studies, we utilised univariable survival analysis following propensity score matching as the matching process effectively balanced baseline covariates to mimic a randomised environment[15]. The threshold for statistical significance, using 2-sided tests, was set at $p < 0.05$. Propensity score matching results were analysed using SMD, where a SMD < 0.1 between cohorts was considered effective matching. To address the concern regarding insufficient follow-up, our analysis utilised TriNetX's built-in Cox Proportional Hazards and Kaplan-Meier logic. Specifically, patients were censored on the day after the last clinical fact recorded in their electronic health record if they had not yet experienced the outcome. This approach ensures that 'late entrants' (e.g., those entering in January 2025) contribute data only for the duration of their observed follow-up and are appropriately censored before reaching the 6 month, 1-year, or 1.5-year marks if their record does not extend that far. No large language model or other generative artificial intelligence tool was used in the design, analysis or writing of this study.

Results

Baseline Demographics

Wing One: With Versus Without Substance Use Disorder

After matching, each cohort included 3 871 162 patients. One cohort comprised patients with MHD in whom comorbid substance use disorder was permitted, and the other comprised patients with MHD with substance use disorder excluded. Mean age at index was 48.9 years in both groups. Each group was 69.8% female and 30.2% male, 77.2% White, 11.2% Black or African American, and 2.7% Asian. All matched characteristics reached a standardised mean difference below 0.1.

Baseline Demographics

Wing Two: Prior MHD Diagnosis Versus Control, Stratified by Sex

The exposure cohort in this wing comprised patients with any qualifying MHD diagnosis, which included substance use disorder along with psychotic, mood, anxiety, and personality disorders. After propensity score matching, the male arm included 2 390 031 patients in the exposure group and 2 390 031 matched controls. Mean age at index was 49.8 years in the exposure group and 49.7 years in controls. The matched groups were 76.2% and 76.8% White, 13.0% and 12.4% Black or African American, and 2.3% each Asian. The female arm included 3 028 120 patients per group. Mean age at index was 48.2 years in the exposure group and 47.7 years in controls. The matched groups were 70.6% and 70.2% White, 16.0% and 16.3% Black or African American, and 2.9% and 2.7% Asian. All matched characteristics reached a standardised mean difference below 0.1.

Follow-up Time Across Cohorts

Mean follow-up reflects the observed time at risk after matching, which fell short of each full window because of staggered enrolment and censoring. Median follow-up reached the full window in every cohort, at 180 days for the 6-month analysis, 365 days for the 1-year analysis, and 540 days for the 1.5-year analysis.

In the substance use arm, the cohort with comorbid substance use had a mean follow-up of 171 days (SD 35) at 6 months, 338 days (SD 83) at 1 year, and 486 days (SD 137) at 1.5 years. The cohort without substance use was followed for 171 days (SD 36), 336 days (SD 86), and 482 days (SD 140). Follow-up was nearly identical between these two cohorts at every interval.

In the male arm, the MHD cohort had a mean follow-up of 169 days (SD 40) at 6 months, 332 days (SD 92) at 1 year, and 476 days (SD 148) at 1.5 years. The matched controls were followed for 161 days (SD 53), 319 days (SD 113), and 459 days (SD 174) across the same intervals.

In the female arm, the MHD cohort had a mean follow-up of 172 days (SD 33) at 6 months, 340 days (SD 80) at 1 year, and 490 days (SD 131) at 1.5 years. The matched controls were followed for 163 days (SD 49), 323 days (SD 107), and 465 days (SD 166).

These means represent the available observation windows after matching rather than a fixed follow-up duration, and patients whose records did not reach the full window were censored.

Risk of Developing Observed Outcomes, Wing One

Among patients with MHD, comorbid substance use disorder was associated with increased risk across all five injury categories. At 1.5 years the hazard ratios were 1.161 for conjunctival and corneal abrasion, 1.254 for contusion, 1.279 for ocular laceration, 1.337 for penetrating wound of orbit, and 1.485 for

penetrating wound with foreign body (all $p < 0.05$). The risk was smallest for the common surface injuries and largest for the penetrating injuries. The 1 year estimates were also significant across all five categories (all $p < 0.05$). At 6 months the effect was weaker and not uniform. Conjunctival abrasion (1.159) and contusion (1.270) were significant, but ocular laceration (1.237), penetrating wound of orbit (1.408), and penetrating wound with foreign body (1.425) were not. Full estimates appear in Table 1, and the 1.5-year estimates are shown in Fig. 2.

Table 1
Hazard ratios (95% CI) for ocular and orbital injury across five categories at 6 months, 1 year, and 1.5 years.

Injury category (ICD-10)	Group	6 months	1 year	1.5 years
Wing 1. With versus without comorbid substance use disorder among psychiatric patients				
Injury of conjunctiva and corneal abrasion without foreign body (S05.0)	Male	1.668 (1.554 to 1.791)	1.643 (1.564 to 1.727)	1.619 (1.553 to 1.688)
	Female	1.787 (1.664 to 1.920)	1.799 (1.709 to 1.894)	1.799 (1.723 to 1.878)
Contusion of eyeball and orbital tissue (S05.1)	Male	3.294 (2.807 to 3.865)	2.839 (2.547 to 3.165)	2.894 (2.640 to 3.173)
	Female	2.673 (2.343 to 3.051)	2.729 (2.478 to 3.005)	2.643 (2.439 to 2.863)
Ocular laceration without prolapse (S05.3)	Male	2.208 (1.623 to 3.005)	2.098 (1.699 to 2.590)	1.871 (1.565 to 2.236)
	Female	1.586 (1.082 to 2.326)	1.656 (1.260 to 2.176)	1.625 (1.281 to 2.063)
Penetrating wound of orbit with or without foreign body (S05.4)	Male	1.461 (1.071 to 1.992)	1.554 (1.218 to 1.982)	1.532 (1.244 to 1.887)
	Female	NR	3.367 (1.898 to 5.974)	2.931 (1.866 to 4.601)
Penetrating wound with foreign body of eyeball (S05.5)	Male	2.462 (1.565 to 3.873)	1.969 (1.457 to 2.661)	1.906 (1.466 to 2.477)
	Female	NR	3.460 (2.158 to 5.546)	2.967 (2.005 to 4.391)
Wing 2. Psychiatric diagnosis versus matched control, by sex				
Injury of conjunctiva and corneal abrasion without foreign body (S05.0)	With vs without SUD	1.159 (1.098 to 1.222)	1.155 (1.111 to 1.200)	1.161 (1.124 to 1.199)
Contusion of eyeball and orbital tissue (S05.1)	With vs without SUD	1.270 (1.163 to 1.387)	1.247 (1.169 to 1.329)	1.254 (1.188 to 1.324)
Ocular laceration without prolapse (S05.3)	With vs without SUD	1.237 (0.956 to 1.602)*	1.350 (1.123 to 1.624)	1.279 (1.088 to 1.503)

CI, confidence interval; HR, hazard ratio; ICD-10, International Classification of Diseases, Tenth Revision; NR, not reported because counts fell below the reporting threshold; SUD, substance use disorder. Wing 1 hazard ratios compare patients with a qualifying psychiatric diagnosis, which by definition includes substance use disorder, against matched controls within each sex. Wing 2 hazard ratios compare psychiatric patients with versus without comorbid substance use disorder. All estimates were statistically significant (CI excluding 1) except those marked with an asterisk. Values were generated using TriNetX univariable survival analysis after 1:1 propensity score matching.

Injury category (ICD-10)	Group	6 months	1 year	1.5 years
Wing 1. With versus without comorbid substance use disorder among psychiatric patients				
Penetrating wound of orbit with or without foreign body (S05.4)	With vs without SUD	1.408 (1.000 to 1.982)*	1.355 (1.042 to 1.761)	1.337 (1.068 to 1.673)
Penetrating wound with foreign body of eyeball (S05.5)	With vs without SUD	1.425 (0.989 to 2.053)*	1.475 (1.120 to 1.942)	1.485 (1.170 to 1.885)

CI, confidence interval; HR, hazard ratio; ICD-10, International Classification of Diseases, Tenth Revision; NR, not reported because counts fell below the reporting threshold; SUD, substance use disorder. Wing 1 hazard ratios compare patients with a qualifying psychiatric diagnosis, which by definition includes substance use disorder, against matched controls within each sex. Wing 2 hazard ratios compare psychiatric patients with versus without comorbid substance use disorder. All estimates were statistically significant (CI excluding 1) except those marked with an asterisk. Values were generated using TriNetX univariable survival analysis after 1:1 propensity score matching.

Risk of Developing Observed Outcomes, Wing Two

A preexisting MHD diagnosis raised the risk of every injury category in both sexes at every time point, and the effect held steady across follow-up. In males at 1.5 years, the hazard ratios were 1.619 for injury of conjunctiva and corneal abrasion without foreign body, 2.894 for contusion of eyeball and orbital tissue, 1.871 for ocular laceration without prolapse, 1.532 for penetrating wound of orbit, and 1.906 for penetrating wound with foreign body of the eyeball (all $p < 0.05$). In females at 1.5 years, the hazard ratios were 1.799 for conjunctival and corneal abrasion, 2.643 for contusion, 1.625 for ocular laceration, 2.931 for penetrating wound of orbit, and 2.967 for penetrating wound with foreign body (all $p < 0.05$). The 6-month and 1-year estimates were consistent in direction and magnitude and were all significant (all $p < 0.05$), with the complete grid shown in Table 1 and the 1.5-year estimates shown in Fig. 3. Female penetrating injury counts at 6 months fell below the reporting threshold, so those two estimates are reported from 1 year onward. Males recorded higher absolute injury counts than females across all five categories, consistent with prior ocular trauma literature. The relative effect of an MHD diagnosis was not higher in males than in females since the confidence intervals for the two sexes overlapped across injury types.

Discussion

Prior work has largely run in the opposite direction, examining the psychiatric consequences of ocular trauma rather than MHD illness as a cause, and the few studies linking mental illness to eye injury have been small or limited to single mechanisms.[12,13,14] To our knowledge, this is the first large scale, propensity matched cohort study to evaluate preexisting mental health disorders and comorbid substance use disorder as risk factors for incident ocular and orbital injury across multiple injury categories. The effect was consistent in both sexes and stable across 6-month, 1-year, and 1.5-year follow up. The strongest signal appeared for contusion of the eyeball and orbital tissue, where risk roughly tripled in males and nearly tripled in females.

Several mechanisms likely drive this association. Mental illness impairs attention, judgement, and reaction time, which raises the risk of falls and blunt trauma. It also raises exposure to interpersonal violence and to self-directed harm. In its most severe form, psychosis produces self-inflicted ocular injury and self-enucleation, which account for some of the gravest penetrating and orbital trauma seen in ophthalmic practice.[16,17] Substance use compounds these pathways. Acute intoxication slows protective reflexes and degrades eye movement control, which raises the chance of accidental and assault related injury.[18] Substance use also worsens or precipitates mental health disorders and vice versa, creating a vicious cycle. Substance use is also overrepresented among patients with self-injurious and penetrating trauma.[19] These mechanisms fit our finding that the added risk from substance use was largest for penetrating injuries.

The pattern matches broader injury data. Comorbid psychiatric conditions raise injury risk in a stepwise way as conditions accumulate, and the presence of substance use accentuates complications after trauma.[20,21] Trauma populations carry a high burden of unrecognised alcohol and drug use, much of it tied to assaultive mechanisms.[22] Alcohol associated eye injuries in particular are far more likely to stem from physical assault than non-alcohol injuries, which aligns with the larger substance use effect we observed for penetrating wounds.[11]

Males had higher absolute injury counts in every category, consistent with the established male predominance in ocular trauma.[2,3,23,24] Yet the relative effect of an MHD was similar across sexes, with overlapping confidence intervals. This suggests that MHD raises ocular injury risk through pathways that operate in both men and women, even though men sustain more injuries overall. The high penetrating injury hazard ratios in women with MHD, though based on smaller counts and wider intervals, point to a vulnerable subgroup that warrants attention. Excess accidental injury in severe mental illness is well documented and is only partly explained by substance use, which supports a direct contribution from the MHD itself.[25,26]

These findings carry clear clinical implications. Ophthalmologists and emergency clinicians who evaluate ocular and orbital trauma should recognise that a history of MHD, and especially comorbid substance use, marks elevated risk. Screening for mental health disorders and substance use at presentation, paired with referral to mental health and substance use services at discharge, offers a path to reduce repeat injury.[27] Trauma settings are well suited to this kind of case finding and brief intervention.[22]

Several limitations are inherent to the TriNetX platform and to retrospective analysis of administrative data, and we addressed them as fully as the data allowed. The temporal relationship between MHD and injury can run in both directions, since injury can itself precede new MHD diagnoses.[28,29] We reduced this concern by requiring the MHD diagnosis and the qualifying medical examination before the injury window and by excluding patients with the outcome before the index event, but residual reverse causation remains possible. Diagnostic accuracy and documentation also vary across institutions

because the data rely on ICD-10 coding. Such variability is likely non differential between cohorts and would bias results towards the null, which makes the observed associations conservative.

The platform also cannot capture several trauma relevant confounders. Patients with MHD and substance use disorder have more frequent healthcare contact, so their injuries are more likely to be recorded, which could inflate the observed associations through detection bias. We could not account for socioeconomic status, housing instability, exposure to violence, seizure or neurocognitive disorders, baseline visual impairment, or use of sedating medications, all of which may independently raise injury risk. We could not capture injury mechanism, severity, or visual outcome, so we cannot say which share of injuries arose from assault, falls, self-harm, or accident. We mitigated measured confounding with propensity score matching and verified that candidate comorbidities such as hypertension and diabetes were already balanced before matching, an approach consistent with prior TriNetX cohort studies of psychiatric populations.[30] The propensity model therefore retained the demographic factors that were imbalanced, using accepted matching methods.[31] A structural point also bears noting. The exposure cohort in the sex stratified comparison included substance use codes, so that comparison reflects any MHD, whereas the substance use comparison isolates the added contribution of comorbid substance use. Finally, staggered enrolment means some patients contributed less than the full window, though censoring handled this and the estimates stayed stable across intervals.

Future work should pair this database signal with clinical detail. Prospective studies that capture injury mechanism, visual acuity, and psychiatric status at the time of injury would clarify causal pathways and identify which patients benefit most from screening.

Declarations

Conflict of interests:

The authors declare that they have no conflict of interest.

Ethics approval:

This study was conducted in accordance with the tenets of the Declaration of Helsinki. The University of Texas Medical Branch Institutional Review Board reviewed the project prior to initiation and determined that it did not constitute human subjects research, because only de-identified, aggregate data obtained through the TriNetX Research Network were analysed. No identifiable private information was accessed and no direct interaction with individuals occurred, so informed consent was not required. TriNetX holds a waiver from the Western Institutional Review Board because its federated design shares only aggregated, de-identified summary data, and no protected health information is exchanged.

Supplementary information

eTable 1 is available at the journal's website.

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Author Contributions:

Ethan Jarrett was responsible for study design, cohort construction and data extraction, statistical analysis, preparation of the figures and tables, and drafting the manuscript. Qiancheng Wang contributed to study design, interpretation of the results and critical revision of the manuscript. Praveena K. Gupta conceived the study, supervised the analysis and interpretation, and revised the manuscript. All authors reviewed and approved the final version and agree to be accountable for the work.

Data Availability:

The data analysed in this study were obtained from the TriNetX Research Network (TriNetX LLC, Cambridge, MA, USA). TriNetX holds the licence to these data, which are not publicly available but raw data can be accessed through TriNetX. The aggregate, de-identified estimates generated during the study are presented in the manuscript and its supplementary files, and further aggregate output is available from the corresponding author on reasonable request. Investigators with an institutional TriNetX subscription can reproduce the analyses using the cohort definitions and the diagnostic and procedural codes listed throughout the manuscript and available in eTable 1.

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Figures

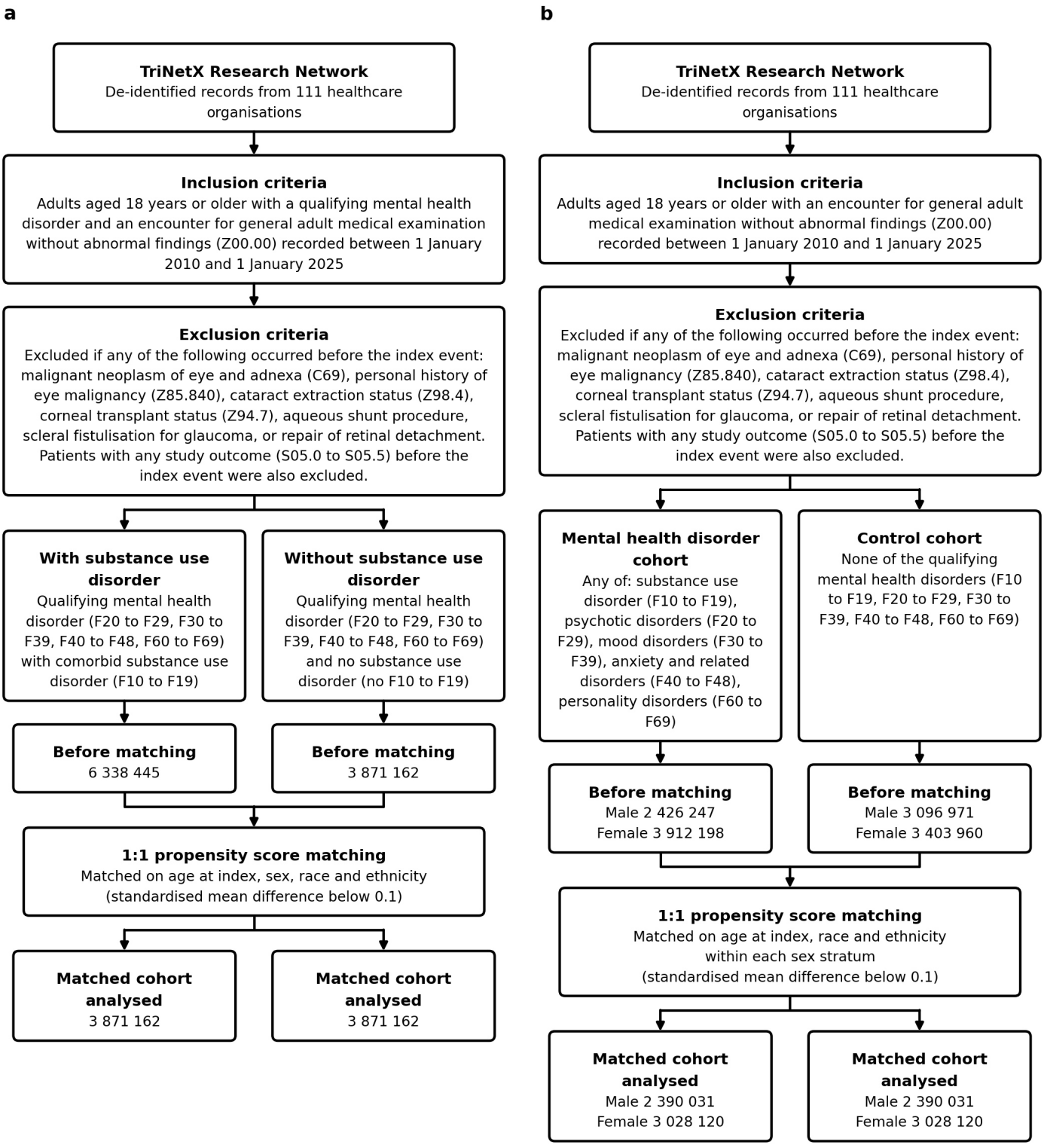


Figure 1

Cohort derivation. (a) Primary comparison, with versus without comorbid substance use disorder among patients with a mental health disorder. (b) Secondary comparison, mental health disorder versus matched control, stratified by sex. Eligible adults were identified as shown and then matched 1:1, on age at index, sex, race and ethnicity in panel a, and on age at index, race and ethnicity within each sex

stratum in panel b. Counts are shown before and after matching. Full inclusion and exclusion criteria appear in the boxes, and the corresponding diagnostic and procedural codes in eTable 1.

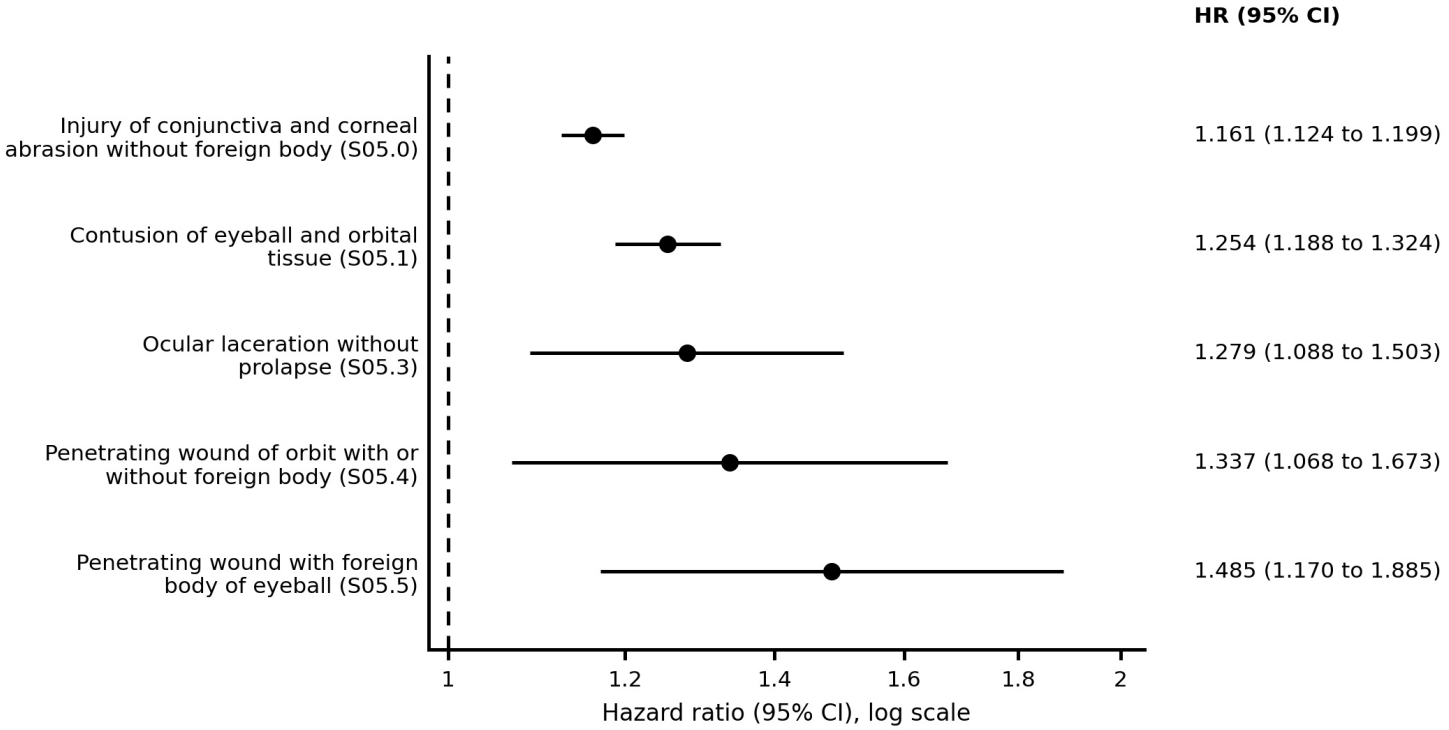


Figure 2

Hazard ratios for ocular and orbital injury with versus without comorbid substance use disorder among patients with a mental health disorder, at 1.5 years. Points are hazard ratios and lines are 95% confidence intervals across five injury categories. The dashed line marks a hazard ratio of 1. All estimates shown were significant. Estimates at all three intervals appear in Table 1.

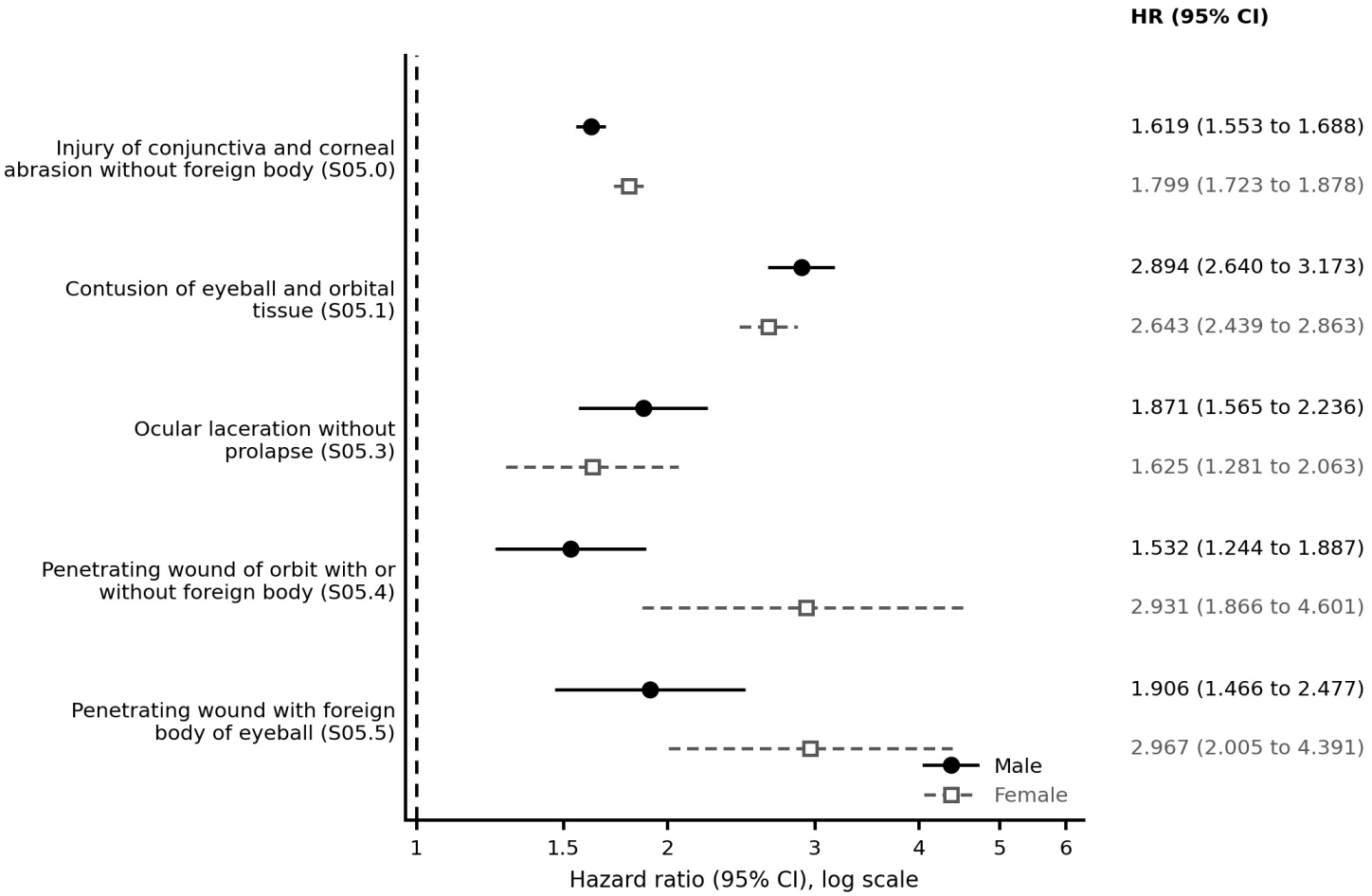


Figure 3

Hazard ratios for ocular and orbital injury with a mental health disorder versus matched controls at 1.5 years, by sex. Points are hazard ratios and lines are 95% confidence intervals for males and females across five injury categories; navy circles with solid lines denote males and orange squares with dashed lines denote females. The dashed vertical line marks a hazard ratio of 1. All estimates shown were significant. Estimates at all three intervals appear in Table 1.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- eTable1.xlsx