

Table S1. WHO criteria distribution among the identified cohort of confirmed mTBI cases

(N=351).

GCS =13-14 (N=117)	LOC ≤ 30 mins (N=185)	Amnesia < 24 hrs (N=229)	Confusion/ disorientation (N=97)	Intracranial injuries (N=31)	N (N=351)	%
✓	✓	✓	✓	✓	2	0.9
✓	✓	✓	✓		18	5.1
✓	✓	✓		✓	5	1.4
✓	✓	✓			10	2.8
✓	✓		✓		6	1.7
✓	✓				6	1.7
✓		✓	✓	✓	4	1.1
✓		✓	✓		32	9.1
✓		✓		✓	2	0.6
✓		✓			17	4.8
✓			✓		2	0.6
✓					13	3.7
	✓	✓	✓	✓	1	0.3
	✓	✓	✓		9	2.6
	✓	✓		✓	1	0.3
	✓	✓			51	14.4
	✓		✓	✓	1	0.3
	✓		✓		4	1.1

✓			✓	3	0.8
✓				68	19.4
	✓	✓	✓	1	0.3
	✓	✓		8	2.3
	✓		✓	2	0.6
	✓			66	18.7
		✓		10	2.8
			✓	9	2.6

WHO: World Health Organization; TBI: Traumatic brain injury; GCS: Glasgow Coma Scale;

LOC: Loss of consciousness.

Table S2. Confirmed mTBI patients (N=351) with documented PTA (N=260) based on the summary PTA-related mTBI designation, accounting for any documented PTA manifestations: observed/self-reported amnesia or confusion/disorientation fulfilling the WHO criteria, behavioural change or acute cognitive impairment on PTA testing.

Summary PTA- related mTBI designatio n (N=260)	Observed/self -reported Amnesia < 24 hrs [WHO criteria] (N=229)	Observed/self -reported Confusion/ disorientatio n [WHO criteria] (N=97)	Observed Behavioura l changes (N=61)	PTA testing administere d (N=182)	N (N=351)	%
✓	✓	✓	✓	✓	27	7.7
✓	✓	✓	✓	-	6	1.7
✓	✓	✓	-	✓	24	6.8
✓	✓	✓	-	-	18	5.1
✓	✓	-	✓	✓	16	4.6
✓	✓	-	✓	-	6	1.7
✓	✓	-	-	✓	75	21. 4
✓	✓	-	-	-	57	16. 2
✓	-	✓	✓	✓	4	1.1
✓	-	✓	-	✓	6	1.7
✓	-	✓	-	-	12	3.4

✓	-	-	✓	✓	1	0.3
✓	-	-	✓		1[^]	0.3
✓	-	-	-	✓	7	2
-	-	-	-	✓§	20#	5.8
-	-	-	-	-	71#	20.
						2

TBI: Traumatic brain injury; WHO: World Health Organization; PTA: Post-traumatic amnesia

Note: in **bold** are confirmed mTBI (N=9) based only on reported behavioural changes and/or cognitive impairment at PTA testing (i.e. PTA documented). All, except one ([^]), met other mTBI WHO criteria (i.e. LOC ≤ 30 mins, GCS=13-14, intracranial injuries).

Confirmed mTBI (N=91) with no documented positive findings for PTA manifestations.

§ Individuals who were tested for PTA and obtained optimal scores (i.e. not in PTA), in the absence of PTA manifestations documented in other sources.

Table S3. Full list of ED diagnosis codes (SNOWMED codes) and ED diagnosis codes indicative of mTBI, for the overall mTBI cohort (confirmed mTBI cases, N=351; indeterminate mTBI, N=180).

SNOWMED Codes	Diagnosis Description	N	%
	Injury of head (disorder)	145	26.3
	Motor vehicle accident victim (finding)	49	8.9
	Minor head injury (disorder)	39	7.1
	Traumatic injury (disorder)	37	6.7
	Falls (finding)	35	6.4
	Concussion (disorder)	26	4.7
	Headache (finding)	11	2.0
	Facial laceration (disorder)	10	1.8
	Victim of physical assault (finding)	9	1.6
	Alcohol intoxication (disorder)	8	1.5
	Falling injury (finding)	8	1.5
	Fractured nasal bones (disorder)	8	1.5
	Laceration of head (disorder)	8	1.5
	Postconcussion syndrome (disorder)	7	1.3
	Injury of face (disorder)	6	1.1
	Subarachnoid hemorrhage (disorder)	6	1.1
	Neck pain (finding)	5	0.9
	Backache	4	0.7
	Intracranial injury without skull fracture (disorder)	4	0.7
	Laceration of forehead (disorder)	4	0.7
	Closed fracture of clavicle (disorder)	3	0.5

Dizziness (finding)	3	0.5
Fracture of maxilla (disorder)	3	0.5
Fracture of rib (disorder)	3	0.5
Injury of neck (disorder)	3	0.5
Laceration - injury (disorder)	3	0.5
Soft tissue injury (disorder)	3	0.5
Subdural hematoma (disorder)	3	0.5
-	2	0.4
Abrasion of face (disorder)	2	0.4
Abrasion of head (disorder)	2	0.4
Alcohol abuse (disorder)	2	0.4
Brief loss of consciousness (finding)	2	0.4
Closed fracture of facial bone (disorder)	2	0.4
Fracture of cervical spine (disorder)	2	0.4
Fracture of face bones (disorder)	2	0.4
Fracture of phalanx of finger (disorder)	2	0.4
Fracture of vertebral column without spinal cord injury (disorder)	2	0.4
Hematoma of face (disorder)	2	0.4
Laceration of lip (disorder)	2	0.4
Motor vehicle accident passenger (finding)	2	0.4
Scalp laceration (disorder)	2	0.4
Superficial laceration of face (disorder)	2	0.4
Blunt injury (disorder)	1	0.2
Cerebral hemorrhage (disorder)	1	0.2
Closed fracture carpal bone (disorder)	1	0.2

Closed fracture of base of skull (disorder)	1	0.2
Closed fracture of multiple ribs (disorder)	1	0.2
Closed fracture of of navicular bone of wrist (disorder)	1	0.2
Closed fracture of one or more phalanges of hand (disorder)	1	0.2
Closed fracture of orbital floor (blow-out) (disorder)	1	0.2
Closed fracture of rib (disorder)	1	0.2
Closed fracture of shaft of fibula (disorder)	1	0.2
Closed fracture of upper end of tibia (disorder)	1	0.2
Compression fracture of vertebral column (disorder)	1	0.2
Contusion (disorder)	1	0.2
Contusion of cerebrum (disorder)	1	0.2
Contusion of shoulder region (disorder)	1	0.2
Crushing injury of skull and intracranial contents (disorder)	1	0.2
Did not wait for treatment (finding)	1	0.2
Elbow fracture (disorder)	1	0.2
Epidural hemorrhage (disorder)	1	0.2
Finding related to falls (finding)	1	0.2
Floaters in visual field (finding)	1	0.2
Foot swelling (finding)	1	0.2
Fracture of distal end of radius (disorder)	1	0.2
Fracture of lumbar spine (disorder)	1	0.2
Fracture of mandible closed (disorder)	1	0.2
Fracture of multiple ribs (disorder)	1	0.2
Fracture of orbit (disorder)	1	0.2
Fracture of orbital roof (disorder)	1	0.2

Fracture of pelvis (disorder)	1	0.2
Fracture of pubis (disorder)	1	0.2
Fracture of skull (disorder)	1	0.2
Fracture of sternum (disorder)	1	0.2
Fracture of thoracic spine (disorder)	1	0.2
Fracture of upper jaw closed (disorder)	1	0.2
Fracture of vertebral column (disorder)	1	0.2
Hematoma (disorder)	1	0.2
Injury of facial nerve (disorder)	1	0.2
Injury of kidney (disorder)	1	0.2
Injury of pancreas (disorder)	1	0.2
Injury of shoulder region (disorder)	1	0.2
Intervertebral disc prolapse (disorder)	1	0.2
Intracranial hemorrhage (disorder)	1	0.2
Laceration of eye region (disorder)	1	0.2
Loss of consciousness (finding)	1	0.2
Migraine (disorder)	1	0.2
Motor vehicle accident driver (finding)	1	0.2
Multiple fractures (disorder)	1	0.2
Muscle strain (disorder)	1	0.2
Neck sprain (disorder)	1	0.2
Open fracture of nasal bones (disorder)	1	0.2
Open fracture of patella (disorder)	1	0.2
Open fracture of tibia AND fibula (disorder)	1	0.2
Open wound of lower leg (disorder)	1	0.2

Pins and needles (finding)	1	0.2
Recurrent falls (finding)	1	0.2
Shoulder pain (finding)	1	0.2
Sprain of wrist (disorder)	1	0.2
Strain of neck muscle (disorder)	1	0.2
Superficial injury of face (disorder)	1	0.2
Superficial injury of head (disorder)	1	0.2
Syncope (disorder)	1	0.2
Transient global amnesia (finding)	1	0.2
Traumatic dislocation of clavicle (disorder)	1	0.2
Traumatic subdural hemorrhage (disorder)	1	0.2
Unexplained falls (finding)	1	0.2
Victim of trauma with multiple injuries (finding)	1	0.2
Vomiting (disorder)	1	0.2
Wound discharge (finding)	1	0.2

Table S4. Significant differences ($p < .05$) between people with and without recorded mTBI diagnosis in Emergency Department (ED) records and/or ED discharge codes indicative of mild traumatic brain injury (mTBI), among confirmed mTBI cases (N=351).

Confirmed mTBI cases (N=351)						
	Cases with no recorded mTBI diagnosis (N=269)	Cases with recorded mTBI diagnosis (N=81)	Statistical comparison p value\$	Cases with no ED discharge codes indicative of mTBI (N=314)	Cases with ED discharge codes indicative of mTBI (N=37)	Statistical comparison p value\$
	N (%)	N (%)		N (%)	N (%)	
Non-traffic-related injury	186 (69.1)	66 (81.5)	0.03	93 (30.6)	3 (8.1)	0.004
Discharge destination			0.0005			0.01
Discharged home	104 (38.7)	29 (35.8)		119 (37.9)	14 (37.8)	

Admitted to ED	104 (38.7)	17 (21)		115 (36.6)	6 (16.2)	
Admitted to ward	61 (22.7)	35 (43.2)		80 (25.5)	17 (46)	
Intracranial injuries on head CT	4 (2)	26 (42.6)	<0.0001	16 (6.7)	14 (50)	<0.0001
Headache	103 (38.3)	46 (56.8)	0.009	127 (40.5)	22 (59.5)	0.03
Concentration problems	0 (0)	4 (4.9)	0.001	2 (0.6)	2 (5.4)	0.01
Follow-up recommendations	83 (30.9)	44 (54.3)	0.0003	106 (33.8)	22 (59.5)	0.002
PTA measured	125 (46.5)	56 (69.1)	0.0003	-	-	-
Recorded mTBI diagnosis in the ED records	-	-	-	85 (27.1)	16 (43.2)	0.04

§ χ^2 , z-test, t-test.

Table S5. Significant differences ($p < .05$) between people tested for Post-traumatic Amnesia (PTA) versus those not tested, among confirmed mild traumatic brain injury (mTBI) (N=351) and indeterminate cases (N=180).

	Confirmed mTBI cases (N=351)			Indeterminate mTBI cases (N=180)		
	Confirmed mTBI not tested for PTA (N=169)	Confirmed mTBI tested for PTA (N=182)	Statistical comparison	Indeterminate mTBI not tested for PTA (N=134)	Indeterminate mTBI tested for PTA (N=46)	Statistical comparison
	N (%)	N (%)	p values§	N (%)	N (%)	p values§
Transported to ED by ambulance	108 (63.9)	142 (78)	0.004	30 (22.4)	26 (56.5)	<0.0001
Traffic-related injury	32 (18.9)	67 (36.8)	0.0002	23 (17.2)	21 (45.7)	0.0001
Discharge destination			<0.0001			<0.0001
Discharged home	98 (58)	35 (19.2)		106 (79.1)	21 (45.7)	
Admitted to ED	43 (25.4)	78 (42.9)		21 (15.7)	15 (32.6)	
Admitted to ward	28 (16.6)	69 (37.9)		7 (5.2)	10 (21.7)	

LOC reported	49 (34.8)	85 (53.1)	0.005	-	-	-
Amnesia reported	85 (71.4)	140 (91.5)	<0.0001	-	-	-
Brain CT performed	116 (68.6)	150 (82.4)	0.003	-	-	-
Intracranial injuries on head CT	2 (1.7)	28 (18.6)	<0.0001	-	-	-
§ χ^2 , z-test, t-test						

Figure S1. Percent of screened ED presentations aged 18-65 years with confirmed or indeterminate mTBI (total 30 479 screened, 351 confirmed mTBI (1.15%), 180 indeterminate mTBI (0.6%).

