Appendix A. Search strategy

MEDLINE (search conducted 11/05/2020)

#	Searches	Results
1	"Wounds and Injuries"/	76432
2	(injur* or trauma*).mp.	1376027
3	1 or 2	1376027
4	Substance-Related Disorders/ or Nonprescription drugs/ or Prescription drugs/ or Illicit drugs/ or Synthetic drugs/ or Alcoholic intoxication/ or Alcoholism/ or Alcohol drinking/ or Alcohol-related disorders/ or Binge drinking/	236020
5	((hazard* or harm* or behavior* or behaviour*) adj4 drink*).mp.	15852
6	(intoxicat* or alcohol* or inebriat*).mp.	457572
7	Amphetamine/ or Methamphetamine/ or Amphetamine-related disorders/ or Benzodiazepines/ or Cannabis/ or Cannabinoids/ or Medical marijuana/ or Marijuana smoking/ or Marijuana abuse/ or exp Cocaine/ or Cocaine-related disorders/ or Psychotropic drugs/ or Hallucinogens/ or Ketamine/ or Phencyclidine/ or Phencyclidine abuse/ or Narcotics/ or Opium/ or Analgesics, opioid/ or exp Opioid-related disorders/ or Inhalant abuse/	202380
8	(amphetamin* or methamphetamin* or benzodiazepin* or cannabi* or marijuana* or marihuana* or cocain* or hallucinogen* or psychotropic* or ketamin* or phencyclidin* or opioid* or opiate* or opium* or narcotic*).mp.	371688
9	4 or 5 or 6 or 7 or 8	868429
10	3 and 9	49435
11	exp "Wounds and Injuries"/et, ep	197709
12	10 and 11	4422
13	(inciden* or prevalen* or epidemiol* or surveillance or screening).mp.	3376999
14	10 and 13	14768
15	12 or 14	15932
16	exp animals/ not humans.sh.	4696997
17	15 not 16	15467
18	limit 17 to (english language and yr="2010 -Current")	7606
19	limit 18 to ("newborn infant (birth to 1 month)" or "infant (1 to 23 months)" or "preschool child (2 to 5 years)")	502
20	(pregnan* or childbirth or parturition* or gestation* or maternal or antenatal or prenatal or perinatal or postnatal or natal or gravidit* or gravida* or multigravid* or primigravid*).mp.	369763

21	(newborn* or neonat* or infant* or preschool* or toddler* or child or children or primary school aged).mp.	911558
22	19 or 20 or 21	1122158
23	18 not 22	6008
24	epidemiologic studies/ or case-control studies/ or retrospective studies/ or cohort studies/ or follow-up studies/ or longitudinal studies/ or prospective studies/ or cross-sectional studies/ or prevalence/ or incidence/	3112787
25	23 and 24	2815

Google Searches (conducted 25/08/2020)

1.	alcohol injury filetype:pdf
2.	(opioid OR opiate OR narcotic) injury filetype:pdf
3.	(cannabis OR marijuana) injury filetype:pdf
4.	cocaine injury filetype:pdf
5.	(amphetamine OR methamphetamine) injury filetype:pdf
6.	benzodiazepine injury filetype:pdf
7.	(Psychotropic OR psychoactive) injury filetype:pdf
8.	(ketamine OR phencyclidine) injury filetype:pdf
9.	hallucinogen injury filetype:pdf

Appendix B. Risk of bias criteria

Item	Criteria
1.	**Was the sample frame appropriate to address the target population?** • **LOW** if inclusion and exclusion criteria are appropriate • **HIGH** if inclusion and exclusion criteria are not appropriate
2.	**Were study participants sampled in an appropriate way?** • **UNCLEAR** if recruitment methods are not reported • **LOW** if: 1) Everyone in the sample frame was assessed for eligibility 2) Random sampling was used for a defined subset of the population • **HIGH** for all other sampling methods
3.	**Was the sample size adequate?** • **N/A** since prevalence studies are descriptive[a]
4.	**Were the study subjects and the setting described in detail?** • **LOW** if age and sex are clearly reported • **HIGH** if age and sex are not clearly reported
5.	**Was the data analysis conducted with sufficient coverage of the identified sample?** • **UNCLEAR** if participants were excluded for missing AOD data • **LOW** if: **1)** All patients had AOD data or <10% of AOD data were missing; OR **2)** ≥10% of participants were missing AOD data, but no differences were reported between patients with and without AOD data • **HIGH** if ≥10% of participants were missing AOD data
6.	**Were valid methods used for the identification of the condition?** • **LOW** for all studies – to be included studies had to use an objective AOD test
7.	**Was the condition measured in a standard, reliable way for all participants?** • **UNCLEAR** if: 1) Timing of AOD testing was not reported. 2) Timing of AOD testing is only reported as "on admission" 3) It is a multi-centre study where there were protocols likely varied between sites. (e.g., difference in the routineness of testing or samples used for AOD testing) • **LOW** if: **1)** Timing of AOD testing (e.g., within 6h, a measure of time to AOD test is reported); AND **2)** The same measure was used for all patients; AND **3)** AOD testing was routinely performed for all patients • **HIGH** if: 1) Multiple measures were used for the same AOD (e.g., BAC was determined using either a blood or breath sample) 2) AOD testing was not routine (e.g., testing is performed at the discretion of clinicians)
8.	**Was there appropriate statistical analysis?** • **LOW** if appropriate (i.e., Percentage and 95% CI or a numerator and denominator are clearly reported) • **HIGH** if: 1) Numerator and denominator are not clearly reported; OR 2) Only percentages are reported (without a numerator and denominator) and there are no corresponding 95%CIs 3) There are inconsistencies in the numbers reported throughout the paper

	• **UNCLEAR** if the study does not report how specific variables were defined/measured (e.g., cut-off values for a positive AOD result are not reported)
9.	**Was the response rate adequate, and if not, was the low response rate managed appropriately?**[b] • **N/A** if the study was retrospective • **UNCLEAR** if: **1)** There are ≥25% refusals and included and excluded patients were not compared **2)** Reasons for exclusion/non-response were not reported • **LOW** if: 1) Refusals are <25% 2) Refusals are ≥25% but the study reports no significant differences between included and excluded patients • **HIGH** if there are ≥25% refusals and there were differences when included and excluded participants were compared

[a]Item 3 was deemed irrelevant for descriptive data following the methods of Ekegren (2018)[18]
[b]25% threshold for refusals was based on the methods of Hoy (2012)[19]

Appendix C. Additional characteristics of included studies.

First author (year)[ref]	Age (years)	Socioeconomic status	Non-acute AOD use
Albrecht (2018)[24]	**Blood Alcohol Concentration (BAC) = 0:** Mean (SD) = 51.5 (22.6), **BAC >0:** Mean (SD) = 43.5 (17.5)[a]	NR	**BAC=0:** Alcohol dependence, n (%): 24 (3.0), **BAC >0:** Alcohol dependence, n (%): 84 (29.3)[a]
Bakke (2016)[25]	Age range, n (%): 18-35 = 349 (35.0), 36-64 = 388 (39.0), ≥65 = 259 (26.0)	NR	NR
Banks (2019)[26]	Mean (SD) = 35 (18.5)	NR	NR
Benson (2018)[27]	Mean (SD) = 36 (15)	NR	NR
Bernier (2016)[28]	Age range, n (%): 18-30 = 4,164 (34.9), 31-50 = 3,883 (32.5), 51-70 = 1,896 (15.9), ≥71 = 2,000 (16.8)	NR	NR
Bjarko (2019)[29]	Mean (SD) = 46.9 (21.3)	NR	NR
Bogstrand (2011)[30]	Age range, n (%): <35 = 449 (35.3), 36-64 = 481 (37.8), ≥65 = 342 (26.9)	NR	NR
Chippendale (2017)[31]	Age range, n (%): 55-64 = 168 (23.6), 65-74 = 167 (23.4), 75-84 = 207 (29.1), ≥85 = 169 (23.8)	NR	NR
Chuang (2016)[32]	**Obese:** Mean (SD) = 60.6 (16.8), **Normal:** Mean (SD) = 65.7 (17.1)[a]	NR	NR
Cordovilla-Guardia (2017)[33]	Median (IQR) = 46 (32-61)	NR	NR
Cordovilla-Guardia (2018)[34]	Median (IQR) = 44 (16-69)	NR	NR
Dorji (2017)[35]	NR	NR	NR
Ekeh (2014)[36]	**Substance use:** Mean (SD) = 74.9 (7.6), **No substance use:** Mean (SD) = 77.7 (7.9)[a]	NR	NR
Forson (2016)[37]	Median (IQR) = 33 (26-42)	NR	NR
Martin (2017)[39]	Mean (SD) = 48 (21)	NR	NR
McAllister (2013)[40]	NR	NR	NR
McLaughlin (2017)[41]	Mean (SD) = 46 (17.4)	Annual income, n (%): <$50,000=152 (40.1), >$50,000=126 (33.2), Unobtainable=101 (26.6)	NR
Nguyen (2014)[42]	Mean (SD) = 49.4 (21.7)	NR	NR
Nweze (2016)[43]	Mean (SD) = 38.2 (14.8)	Employment status, n (%): Unemployed: 393 (53.3), Employed: 299 (40.5), Retired: 23 (3.1), Student: 23 (3.1)	NR
Pandit (2014)[44]	Mean (SD) = 46.3 (21.6)	NR	NR
Peng (2016)[45]	**Intoxicated:** Mean (SD) = 40.4 (11.5), **Not intoxicated:** Mean (SD) = 43.0 (13.6)[a]	NR	NR
Rundhaug (2015)[46]	**BAC measured:** Median (IQR) = 38.0 (22.9-52.4), **BAC not measured:** Median (IQR) = 46.2 (24.3-60.8)[a]	NR	NR

Staton (2018)[47]	Mean (SD) = 34.4 (13.3)	Employed, n (%) = 416 (80.6)	NR
Strong (2016)[48]	Age range, n (%): <65 = 5,447 (72.2), ≥65 = 2,094 (27.8)	Median income, n (%): <$48,519=1,833 (24.3), $48,520 - $65,062=1,802 (23.9), $65,063 - $85,588=1,812 (24.0), >$85,589=1,790 (23.7)	NR
Talving (2010)[49]	Mean (SD) = 37.0 (12.7)	NR	NR
Valdez (2016)[50]	Mean (SD) = 44.1 (19.2)	NR	NR
Ye (2013)[53]	NR	Country income level: high	Current drinkers (%): 85.9
	NR	Country income level: high	Current drinkers (%): 80.9
	NR	Country income level: medium	Current drinkers (%): 70.0
	NR	Country income level: medium	Current drinkers (%): 83.4
	NR	Country income level: low	Current drinkers (%): 76.6
	NR	Country income level: low	Current drinkers (%): 57.0
	NR	Country income level: low	Current drinkers (%): 76.2
	NR	Country income level: medium	Current drinkers (%): 66.6
	NR	Country income level: low	Current drinkers (%): 46.8
	NR	Country income level: medium	Current drinkers (%): 70.2
Yue (2017)[51]	Mean (SD) = 42.7 (16.8)	Mean years of education (SD): 14.1 (2.7)	NR
Yue (2020)[52]	Mean (SD) = 41.4 (17.6);	Employment status, n (%): Employed=74 (55.6), Unemployed=32 (24.1), Not in paid workforce=22 (16.5)	Prior medical history of substance use, n (%) =20 (15.0)

Abbreviations: AIS: Abbreviated Injury Scale; BAC=Blood alcohol concentration; GCS=Glasgow Coma Scale; IQR=Interquartile range; ISS=Injury severity score; NR=Not reported; SD=Standard deviation; TBI =Traumatic brain injury. [a]Bold text indicates sub-groups as defined by the original study.

Appendix D. Risk of bias assessment.

Risk of sampling bias (Items 1 and 2 on the checklist) was low overall, with only three studies not reporting their recruitment methods clearly. All but three studies adequately described the age and sex of study participants (Item 4).[35 40 53] However, nine papers had high risk of reporting bias (Item 8), with seven only reporting prevalence as percentages[29-31 36 44 49 53] and two using the total sample as the denominator despite reporting that not all patients were tested.[39 45]

As inclusion criteria required studies to use an objective toxicology test, all studies were assessed as having a valid AOD measure (Item 6). However, risk of bias was largely unclear regarding coverage (Item 5), measurement (Item 7) and attrition biases (Item 9). Eleven papers did not clearly report the proportion of patients who had missing AOD data, with most studies excluding patients who were missing these data.[26-28 31 32 37 39 43-45 50] A further 10 papers reported missing large proportions of AOD data (17-88%).[29 34 36 41 42 48 51-53 71] Fifteen papers had unclear risk of measurement bias, largely because authors did not report on the timing of AOD testing, which could lead to underestimations in prevalence if testing was delayed beyond the window of detection for acute AOD use.[24 28 29 31 32 36 42 44 46 48-53] A further six were assessed as high risk of bias for either using inconsistent methods to measure AOD use, or for not performing testing on a routine basis.[26 27 37 39 41 45] In particular, three papers reported that testing was only performed when AOD use was suspected by clinicians, which could lead to overestimations in prevalence.[39 41 45] Sixteen records reported on retrospective or registry-based cohorts, meaning that risk of attrition bias (Item 9) was deemed not applicable. The remaining studies required patients to consent to study involvement, including six that had low risk of attrition bias (<25% did not provide consent) and eight that did not report the proportion of people who consented to participate.