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What do we know about the extent of cannabis use and dependence? Results of a global systematic review

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WHAT DO WE KNOW ABOUT THE EXTENT OF CANNABIS USE AND DEPENDENCE? RESULTS OF A GLOBAL SYSTEMATIC REVIEW

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EXECUTIVE SUMMARY

Aims: Systematically review peer reviewed and grey literature on the global prevalence of cannabis use and dependence. This article aims to present the first systematic review of existing data on the prevalence of cannabis use and dependence in all UN member countries. This comprehensive review systematically identified available studies in the peer reviewed and grey literature on the prevalence of cannabis use and dependence using systematic methods that are transparently reported. The result is a summary of the most recent prevalence estimates of cannabis use and dependence for each UN member country.

Methods: Multiple search strategies: a) peer-reviewed literature searches (1990-2008) using methods recommended by the Meta-analysis of Observational Studies in Epidemiology (MOOSE) group; b) systematic searches of online databases; c) Internet searches to find any other evidence of use; d) repeated consultation and feedback from experts around the globe; e) a viral email sent to lists in the HIV and illicit drug fields. Culling and data extraction followed manualised protocols, with in-built systems of cross-checking and internal consistency. Data were extracted and graded according to predefined variables and quality scored. This paper reports the most recent and highest graded prevalence estimate for the general population and school population and reports the proportion of coverage of the world's population for use and dependence estimates, general population and school surveys, age and sex specific estimates, and most recent year of estimates.

Results: Evidence of cannabis use or dependence was found for 99.8% of the world's population aged 15-64 years across 202 countries/territories; in 108 countries no prevalence estimates were available. School surveys were more common (90 countries) than general population surveys (58 countries). Reported point prevalence estimates of cannabis use in the general population ranged from 0% to 14.1%. Only seven countries had estimates of cannabis dependence (comprising 24.9% of the world's population aged 15-64 years); three countries had national estimates and four countries had sub-national estimates. General population prevalence estimates of cannabis dependence ranged from 0.1% to 1.3%.

Conclusions: There are large gaps in data on the global prevalence data of cannabis use and dependence. The improvement of global data in all countries of the world is necessary to inform policy makers to better respond to the harms related to cannabis use and dependence.

1. INTRODUCTION

Cannabis is widely used in developed societies and increasingly used in developing societies (1, 2). Cannabis is a generic term for preparations (e.g. marijuana, hashish and hash oil) derived from the *cannabis sativa* plant. Cannabis may be smoked (in a joint or from a bong) or ingested (eaten). Cannabis contains the psychoactive ingredient of delta-9-tetrahydrocannabinol (THC) that acts upon a specific cannabinoid receptor (CB_1) in the brain (3).

Continued heavy cannabis use can result in dependence (2, 4). DSM-IV cannabis dependence is diagnosed when three (or more) of the following criteria are met: tolerance; increased amounts taken; persistent desire or unsuccessful attempts to cut down or control use; and a great deal of time is spent using or acquiring cannabis (5). Dependent use is typically characterised by regular cannabis use over a period of weeks/months that moves into a pattern of increased frequency and amount. When using large quantities of cannabis the acute effects of intoxication may include feeling anxious, paranoid and at times experiencing hallucinations. Although withdrawal is not included in the DSM-IV definition of cannabis dependence, recent evidence indicated that discontinuing use may cause irritability, restlessness, increased appetite, weight change and difficulty sleeping (6).

Global patterns of cannabis use have been estimated by the United Nations Office on Drugs and Crime (UNODC) (7). The UNODC uses data reported to the United Nations by Member States through the Annual Reports Questionnaire (ARQ), to estimate the prevalence of cannabis and other illicit drug use. Although this is a very important source of data, estimation methods are not provided in these reports. The UNODC also does not have the time and resources to systematically review the peer reviewed and grey literature and so there has never been a systematic review of the global patterns of cannabis use and dependence.

This article aims to fill these gaps by presenting the first systematic review of existing data on the prevalence of cannabis use and dependence in all UN member countries. This comprehensive review systematically identified available studies in the peer reviewed and grey literature on the prevalence of cannabis use and dependence using systematic methods that are transparently reported. The result is a summary of the most recent prevalence estimates of cannabis use and dependence for each UN member country.

2. METHOD

According to an approach being used across searches undertaken for the 2005 Global Burden of Disease project (GBD), a systematic review was undertaken for cannabis dependence and use. Standardised approaches to literature searches, search terms, data collection, data extraction, consistency and error checking, and expert consultation and review were taken. These are mentioned below and are all documented in further detail on the methodology page of the GBD expert group's website: http://www.gbd.unsw.edu.au/gbdweb.nsf/page/Methodology.

2.1. Peer reviewed literature

The search was conducted through numerous stages (see **Text Box 1**). First, searches in the peer-reviewed literature were conducted using a strategy consistent with the

methodology recommended by the Meta-analysis of Observational Studies in Epidemiology (MOOSE) group (8) using a broad search string to interrogate three electronic databases: Medline, EMBASE and PsycINFO. These databases were chosen after consultation with a qualified archivist. Searches focused on studies of human subjects published between 1990 and 2008 inclusive. No limitations were set on language of publication. Search strings, tailored to each database (including keywords, MeSH terms, EMTREE terms and explode terms) were devised for different subjects areas (see **Appendix A** for search strings and **Appendix B** for search string combinations). In an attempt to include all relevant articles, including those that were not published in English researchers searched LILACS, an online multilingual database. In addition, experts who spoke languages other than English and conduct research in non-English speaking countries were contacted asking for relevant data sources translated into English when data could not be located for that country.

Text Box 1: STAGES OF WORK

Systematic Search

1. Three electronic databases were searched (Medline, EMBASE,PsycINFO)
2. Hand searching of reference lists of review articles and articles of importance
3. Initial cull of peer reviewed literature
4. Short list of peer reviewed studies reviewed
5. Grey literature web-based searches
6. Short list of grey literature studies reviewed
7. *Expert comment* (including members of the Mental Disorders and Illicit Drug Use Expert Group) on completeness of included studies from electronic database search and grey literature search.

Data Extraction

8. Data extraction into Microsoft Access Database®
9. Cross-checking of extracted data
10. Web-wide searches for any evidence of use for countries without available prevalence estimates
11. De-duplication of studies reported in multiple publications

Expert consultation

12. Data requests sent to UNODC and WHO
13. List of included studies sent to other researchers with expertise in the area
14. Coverage of data reviewed by ATS experts at UNODC
15. Email sent to email lists and posted on drug research information websites requesting additional data for countries where no estimates were located

Second, lists of review articles and recommended articles from experts were individually screened for studies that may not have been identified by the electronic database search. Third, abstracts of the identified articles were read and excluded if they did not: focus on cannabis or prevalence or incidence, include raw data (review articles), include general population samples (school studies were included), included data before 1990 or comprised multiple articles reporting from the same cohort (in which case only the most recent or relevant article was included). Nationally representative studies were preferred over sub-national studies: sub-national studies were conducted in cities which were nationally unrepresentative (typically the largest or capital city).

2.2. Grey Literature

The second stage of the systematic search, conducted during 2008, covered the grey literature. A systematic approach (described in (9)) was used to search databases and websites of government agencies and non-government organisations to identify reports and statistics. Data were collected by one research team member and cross checked by another member of the research team.

2.3. Data Extraction

In the data extraction stage we obtained information about study design and participants as recommend by the Strengthening the Reporting if Observational Studies in Epidemiology (STROBE) guidelines (10, 11), parallel to the CONSORT guidelines for reporting of randomised trials (12).

A Quality Index (see **Appendix C**) was modelled on one developed by John McGrath and Sukanta Saha (13, 14) and modified via the 'Delphi method' following consultation with, and consensus agreement by, the Expert Group (see Acknowledgements) and central GBD project personnel. Quality variable responses were assigned scores that were summed to create a Quality Index score that ranged from 0 to 15, for each study. Highest scores were achieved by general population based cohort studies that provided age and sex disaggregated prevalence estimates. Additional text was also included in the extraction process to capture the diversity of reported methodology. This was used to determine if any studies with a low numeric quality index score should also be included.

A tri-level Microsoft Access© database was designed to accommodate the illicit drugs data, which allowed computerised cross-checking of data entered; in addition, a random sample of 10% of data sources was cross-checked by another research team member to check consistency and accuracy of data extraction. Quality assurance was also built into the database by using drop down boxes and restricted entry of characters. Data entry was manualised (see **Appendix D** for database manual including data entry rules). Queries were written to export complete datasets from the database into Microsoft Excel©.

2.4. Searching for evidence of use in countries without prevalence estimates

Searches for "any evidence of cannabis use" were conducted using several major approaches. First, reports and surveys that were referenced in the 2008 World Drug Report (15) were sourced. Second, reports and peer-reviewed articles that did not meet inclusion criteria as sources of prevalence estimates, but which include data on the use of amphetamines, were used.

Finally, the Internet was used to search databases and search engines. Searches were also conducted using the following databases: WorldCat, PsychINFO and PubMed; and the following search engines: Google and GoogleScholar, with searches targeted at drug use in specific countries (see **Appendix E** for search strings used). These databases and search engines allowed for the inclusion of a broad range of information sources. Evidence of cannabis use was identified in a number of grey literature sources, including UNODC reports, government reports, surveys, news reports and journal articles (See Supplementary Table); this "evidence" included data on treatment, seizures, registered drug users and reports of cannabis use occurring.

2.5. Expert consultation

Experts were consulted at every stage during this process. Lists of articles were emailed to check for completeness on several occasions during the review. Summary tables of country coverage of dependence, use and any evidence of use were emailed to cannabis experts and contacts at the UNDOC, asking them to identify additional studies to fill gaps. Updated summary tables were emailed on several occasions to the expert group, core GBD personnel and other personnel to confirm data coverage and accuracy.

In May 2009, a "viral email" was sent out to known email lists, experts and interest groups in the area of illicit drug or HIV research, advocacy, or policy, listing the countries for which we had no data on the prevalence of cannabis use and/or dependence, with invitations for comment or submission of additional data for a final check of data coverage. This resulted in a number of additional recent reports (largely from low and middle income countries) that had recently been completed.

2.6. Data grading

Data were hierarchically graded according to study source/methodology (adapted from (16); see **Text Box 2**). Data were displayed for each country, grouped according to GBD study-defined regions (see **Appendix F** for countries/regions). We categorised estimates of use imputed by UNODC and reported in the 2008 World Drug Report with no details as "evidence of use" (graded "E" estimates), because they did not meet the primary inclusion criteria requiring details of methods used (or data sources and methodology used to impute estimates; see Supplementary Table).

Text box 2: HIERARCHICAL GRADING SYSTEM	
A1	Multiple and varied methods of indirect prevalence estimation
A2	Three sample capture-recapture, multivariate indicator or back projection method of prevalence estimation. Multiple but similar methods of indirect prevalence estimation.
A3	Two sample capture-recapture or multiplier method of prevalence estimation
B1	General population survey
B2	School survey
B3	University sample
B4	Convenience sample
C1	Expert consensus (including Delphi)
C2	Rapid assessment or other documented 'expert' judgement
D1	Government registration of drug users
D2	Official government estimate with no methodology reported not including government registration of drug users
E	Estimate with methodology unknown

2.7. Searches

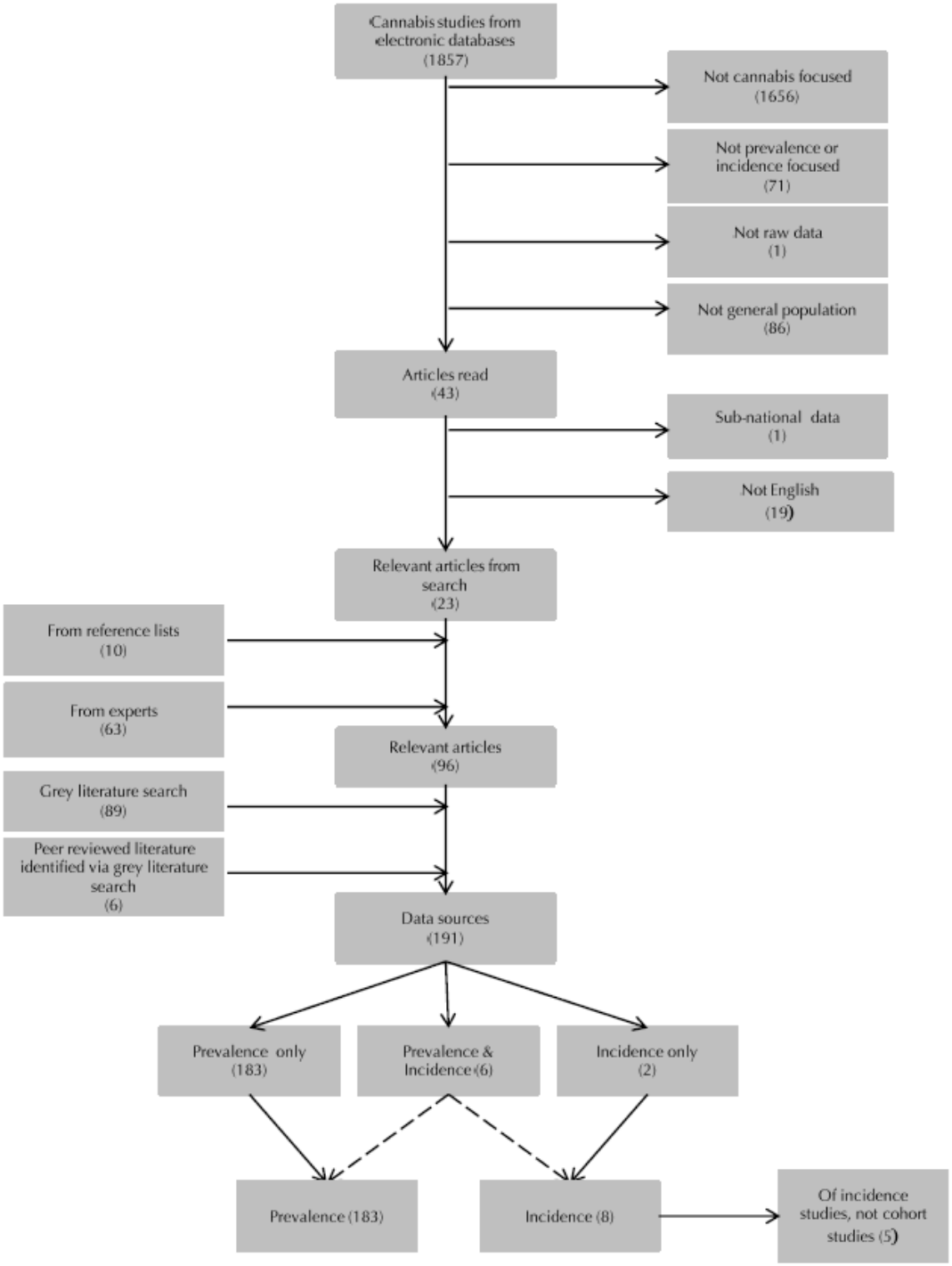
Figure 1 shows the overall search/cull process. Using these processes, 1857 studies were found for cannabis use and dependence estimates. Of these; 1656 were not cannabis focused, 71 were not prevalence/incidence estimates, 1 had no raw data, 86 were not from a general population, 1 was sub-national (and national estimates were available for that country) and 19 were not in English. An additional 10 articles were identified from reference lists of review articles and recommended articles from experts, 63 articles were identified by experts and 95 articles were found from grey literature searches, leading to

191 data sources (including grey literature and articles with prevalence estimates). See (18) for a flowchart of the culling process.

In this paper, we report the most recent and highest graded prevalence estimate for the general population and school population: country-level meta-analysis of estimates over time were not conducted because of the possibility that differences reflected real population-level changes. In any case, such trends would only be available in a few (high income) countries.

This paper reports the proportion of coverage of the total world's population and also the world's population aged between 15-64 years were calculated for use and dependence estimates, general population and school surveys, age and sex specific estimates, and most recent year of estimates. Population numbers were provided by the United Nations population division of Urban/Rural data for the Global Burden of Disease project.

Figure 1: Flowchart of search strategy for prevalence of cannabis use and dependence



3. RESULTS

3.1 Evidence of cannabis use and dependence

Evidence of cannabis use or dependence was located for almost all of the world's population aged 15-64 years (201 countries/territories; 99.8% of the world's population aged 15-64 years) (**Table 1**). In over half of these countries there were prevalence estimates of use (108 countries) while estimates of dependence were available for only seven countries (**Table 2**). The populations of countries that did not have prevalence estimates but did have evidence that use was occurring comprised 15% of the world's population aged 15-64 years, predominantly countries in Asia, Oceania, the Middle East and Africa (**Table 3**). A large proportion of the available data came from grey literature sources. No data was available for less than 1% of the world's population aged 15-64 years.

Table 1: Coverage of the world's population covered by estimates of the prevalence of cannabis use or dependence

	Number of countries	Total population covered	Population aged 15-64 years covered
Evidence of use and dependence			
Prevalence estimate of use or dependence	94	83.0%	84.5%
Evidence of use but no prevalence estimates	108	16.7%	15.3%
Total*	201	99.7%	99.8%
Coverage of the world's population by differing study samples and estimate types			
Cannabis dependence estimate			
National	3	5.8%	6.0%
Sub-national	4	19.3%	18.9%
Cannabis use estimate			
National	88	79.8%	81.2%
Sub-national	7	3.4%	3.3%
Cannabis use estimate – general population			
National	56	72.2%	73.7%
Sub-national	2	0.7%	0.6%
Cannabis use estimate - school children			**Percentage 15-19 years covered**
National	83	--	22.4%
Sub-national	7	--	7.7%
Cannabis dependence sex specific estimates			
National	2	0.01%	0.01%
Sub-national	1	0.0006%	0.0006%
Cannabis use sex specific estimates			
National	79	65.3%	66.9%
Sub-national	1**	1.1%	1.1%
Cannabis dependence age specific estimates (excl. school surveys)	3	0.06%	0.06%
Dependence (national)	0	0.0%	0.0%
Dependence (sub-national)			
Cannabis use age specific estimates (excl. school surveys)	56	61.7%	63.2%
National	0	0.0%	0.0%
Sub-national			
Date of most recent prevalence estimates* **			
2005-2007	71	23.8%	25.4%
2000-2004	27	38.1%	39.9%
Before 2000	4	4.5%	4.2%

Note. Estimates may be past year, point or lifetime estimates. Sub-national studies are **only** included for countries when there is no available national data from general population or school surveys. The "Evidence of use and dependence" section is additive, but the "Coverage of the world's population" section is not – each country can be counted more than once. *Totals found across 229 countries or territories. ** no school survey available for Iran so study with university sample noted here. *** Dominica did not report the year of the estimate.

The most recently reported prevalence estimates were from the period 2005-2009 (n = 71). A number of countries did have prevalence estimates that were more dated: 27 countries with estimates from 2000-2004 and 4 countries with estimates before 2000.

Estimates of use were more likely to have been based upon surveys of school children. This was true for 90 countries (whose populations comprised 30.1% of the world's population aged 15-19 years of age) that had conducted either national (n = 83) or sub-national (n = 7) school surveys. Fifty-eight countries had either a national (n = 56) or sub-national (n = 2) estimate of cannabis use in the general population; their populations comprised 74.3% of the world's population aged 15-64 years. Seven countries had made estimates of the prevalence of cannabis dependence in the past 10 years. These comprised three national and four sub-national estimates in countries whose populations accounted for 24.9% of the world's population aged 15-64 years.

Age and sex specific estimates were rarely reported for dependence estimates. Two countries reported national sex specific estimates of the prevalence of dependence and one country reported a sub-national sex specific estimate; three countries reported national age-specific prevalence estimates. Age and sex specific estimates were more often reported for use: of the 58 countries that reported on general population surveys, 55 reported age-specific estimates; sex specific estimates of use (including estimates from general population or school surveys) were reported in 80 countries. Many estimates were dated: in the case of most recent prevalence estimates for each country, 4 studies were conducted in 1999 or earlier, 28 between 2000 and 2006, and 70 in 2005 or later.

3.2 Cannabis dependence estimates

In the past 20 years, very few estimates have been made of the extent of cannabis dependence (**Table 2**). Age ranges for cannabis dependence estimates varied largely across studies, for example: a school sample of 12-18 year olds in Canada (22); a prospective cohort of 26 year olds in New Zealand (23); young adults (24-34 years) in Germany (24); and population samples of 18-64 years in Australia (25) or 10+ years in India (26). Most countries that estimated rates of cannabis dependence used general population surveys. A school survey estimate (in additional to a general population survey estimate) was included for the United States (27, 28) and Canada only reported a school survey estimate (22). General population estimates of cannabis dependence were 1% or below for the United States (27), Germany (24) and India (26). Three countries reported estimates above 1%: Australia (1.5% (25)); the United Kingdom (3.2% (29)) and New Zealand (9.4 (23)). School survey cannabis dependence estimates were higher: 2.7% in Canada (22) and 10% in the United States (28).

Table 2: Data on the prevalence of cannabis dependence

Region/ Country	Dependence: Point or past year Prevalence (95% CI)	Year of estimate	Age (yrs)	Grade	Quality score	Source	Dependence: "Lifetime Prevalence"**	Year of estimate	Age (yrs)	Grade	Quality score	Source
Australia	1.5 (1.2,1.8)	1999	18-64	B1	12	(25)	--	--	--	--	--	--
Canada	2.7*+ (NR)	2007	12-18	B2	10	(22)	--	--	--	--	--	--
Germany	0.14* (NR)	2005	24-34	B1	12	(24)	3.1* (NR)	2005	24-34	B1	12	(24)
India	0.1*+(NR)	2000	10+	B1	9	(26)	--	--	--	--	--	--
New Zealand	9.4* (NR)	2000	26	B1	13	(23)	3.6* (NR)	2000	18-23	B1	12	(50)
United Kingdom	3.1 (NR)	2000	16-74	B1	12	(29)	--	--	--	--	--	--
United States	1.0 (NR)	2007	12+	B1	13	(51)	1.3 (NR)	2004	15+	B1	13	(27)
	10* (NR)	1999	17	B2	7	(28)	--	--	--	--	--	--

Note. All estimates are reported as percentages, * sub-national data, + past month prevalence (past year prevalence not available).

3.3 Cannabis use estimates

Estimates of use were grouped according to "lifetime" or past year use; past month use was less commonly assessed and were only included when a past year prevalence estimate was not available for a country.

Point prevalence rates were highest for young people in North America, and parts of Eastern and Western Europe and Australasia (namely New Zealand). The highest point prevalence estimate of cannabis use for young people came from the Isle of Man (34%; (30)) followed by the United States (31.74%; (31)) and the United Kingdom (31%; (30)) . Rates were lowest for areas in South and Central America, Asia and Africa (**Table 3**). Both Vietnam and Burkina Faso reported the lowest estimate (0.3%; (32, 33))

General population point prevalence estimates revealed a different pattern (**Figure 2**). While Canada was consistently in the high range, the rest of North America was not. Parts of Western Europe, Asia and Australasia (namely New Zealand) were also in the high range. The highest point prevalence general population estimate was 14.1% and reported by both Canada (34) and Bangladesh (35). China, Iraq and Romania had the lowest rates reported: China and Iraq recorded 0% (36) and Romania 0.1% (36).

Only four countries reported high rates of cannabis use in young people and the general population: Canada, Italy, Spain, and the United Kingdom. Two countries consistently had low estimates rates of cannabis use: Romania and El Salvador.

Figure 2: Available estimates of the prevalence of cannabis use in the past year among the general population

Note: Prevalence estimates are presented from nationally representative general population studies. If no national general population study was available for a given country a national school survey or sub-national study may be represented in the map. This is for illustrative purposes and details should be examined in Table 3.
It is important to note that age ranges differ across studies included in this map. Study details including age ranges may be found in Table 3.

Table 3. Data on the prevalence of cannabis use

Region/Country	Use: Past Year Prevalence (95% CI)	Year of estimate	Age	Grade	Quality score	Source(s)	Use: "Lifetime Prevalence"** (95% CI)	Year of estimate	Age	Grade	Quality Score	Source(s)	Type of evidence of any use for countries with no prevalence estimate available	Grade	Any Evidence of Use Source
ASIA PACIFIC, HIGH INCOME															
Brunei	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures and arrests	D2	(52)
Japan	0.2	2002-2003	20+	B1	--	(36)	1.4	2002-2003	20+	B1	--	(36)	--	--	--
Republic of Korea	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Singapore	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures and arrests	D2	(52)
ASIA, CENTRAL															
Armenia	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)
Azerbaijan	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)
Georgia	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(54)
Kazakhstan	--	--	--	--	--	--	--	--	--	--	--	--	Registered drug users	D1	(7)
Kyrgyzstan	--	--	--	--	--	--	--	--	--	--	--	--	Registered drug users	D1	(7)
Mongolia	--	--	--	--	--	--	--	--	--	--	--	--	Treatment admissions	D1	(7)
Tajikistan	--	--	--	--	--	--	--	--	--	--	--	--	Registered drug users	D1	(7)
Turkmenistan	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(7)
Uzbekistan	--	--	--	--	--	--	--	--	--	--	--	--	Registered drug users	D1	(7)

A1: Multiple and varied methods of indirect prevalence estimation; **A2:** Three sample capture-recapture, multivariate indicator or back projection method of prevalence estimation. Multiple but similar methods of indirect prevalence estimation; **A3:** Two sample capture-recapture or multiplier method of prevalence estimation; **B1:** General population survey; **B2:** School survey; **B3:** University sample; **B4:** Convenience sample; **C1:** Expert consensus (including Delphi); **C2:** Rapid assessment or other documented 'expert' judgement; **D1:** Government registration of drug users; **D2:** Official government estimate with no methodology reported not including government registration of drug users; **E:** Estimate with methodology unknown

Region/Country	Use: Past Year Prevalence (95% CI)	Year of estimate	Age	Grade	Quality score	Source(s)	Use: "Lifetime Prevalence"** (95% CI)	Year of estimate	Age	Grade	Quality Score	Source(s)	Type of evidence of any use for countries with no prevalence estimate available	Grade	Any Evidence of Use Source
ASIA, EAST															
China	0	2002-2003	18+	B1	--	(36)	0.3	2002-2003	18+	B1	--	(36)	--	--	--
Democratic People's Republic of Korea	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hong Kong	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	B3	(55)
Taiwan	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
ASIA, SOUTH															
Afghanistan	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC	C2	(56)
Bangladesh	14.1+	1997	NR	B1	8	(35)	25.8	1997	NR	B1	8	(35)	--	--	--
Bhutan	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	C2	(57)
India	3#	2000-2001	12-60	B1	8	(58)	4.1#	2001-2002	12-60	B1	8	(58)	--	--	--
Nepal	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of abuse	C2	(59)
Pakistan	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
ASIA, SOUTHEAST															
Cambodia	--	--	--	--	--	--	--	--	--	--	--	—	Evidence of use	C2	(60)
Indonesia	26.75	2005	10-60	B1	8	(61)	84.9	2005	10-60	B1	8	(61)	--	--	--
Lao People's Democratic Republic	--	--	--	--	--	--	2.1*	2008	12-24	B2	--	(62)	--	--	--
Malaysia	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures, arrests and treatment	D2	(52)
Maldives	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by	C2	(7)

A1: Multiple and varied methods of indirect prevalence estimation; **A2:** Three sample capture-recapture, multivariate indicator or back projection method of prevalence estimation. Multiple but similar methods of indirect prevalence estimation; **A3:** Two sample capture-recapture or multiplier method of prevalence estimation; **B1:** General population survey; **B2:** School survey; **B3:** University sample; **B4:** Convenience sample; **C1:** Expert consensus (including Delphi); **C2:** Rapid assessment or other documented 'expert' judgement; **D1:** Government registration of drug users; **D2:** Official government estimate with no methodology reported not including government registration of drug users; **E:** Estimate with methodology unknown

Region/Country	Use: Past Year Prevalence (95% CI)	Year of estimate	Age	Grade	Quality score	Source(s)	Use: "Lifetime Prevalence"** (95% CI)	Year of estimate	Age	Grade	Quality Score	Source(s)	Type of evidence of any use for countries with no prevalence estimate available	Grade	Any Evidence of Use Source
													UNODC^		
Mauritius	--	--	--	--	--	--	10.9	2004	15-18	B2	6	(63)	--	--	--
Mayotte	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Myanmar	8.17*	2004	13-21	B2	8	(64)	10.74*	2004	13-21	B2	8	(64)	--	--	--
Philippines	--	--	--	--	--	--	33.65	1999	10-44	B1	10	(65)	--	--	--
Seychelles	12	2004	11-17	B2	13	(66)	14	2004	11-17	B2	13	(66)	--	--	--
Sri Lanka	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Thailand	1.5	2001	12-64	B1	9	(67)	12.1	2001	12-64	B1	9	(67)	--	--	--
Timor Leste	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Viet Nam	0.3	2002	11	B2	11	(33)	0.6	2002	11	B2	11	(33)	--	--	--
AUSTRALASIA															
Australia	9.1	2007	14+	B1	11	(68)	33.5	2007	14+	B1	11	(68)	--	--	--
	14.2	2005	12-17	B2	11	(69)	17.8	2005	12-17	B2	11	(69)			
New Zealand	13.1	2003-2004	16+	B1	--	(36)	41.6	2003-2004	16+	B1	--	(36)	--	--	--
	11.37	1995	16-24	B2	14	(70)	68.9*	1998	21	B2	12	(50)			
CARIBBEAN															
Anguilla	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)
Antigua and Barbuda	13.4	2005	NR	B2	--	(71)	24.9	2005	NR	B2	--	(71)	--	--	--
Aruba	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(72)
Bahamas	8.6	2003	10-19	B2	13	(73)	14.9	2003	10-19	B2	13	(73)	--	--	--
Barbados	8.3	2007	NR	B1	5	(74)	16.3	2007	NR	B1	5	(74)	--	--	--
	10.6	2006	13-17	B2	--	(75)	17.4	2006	13-17	B2	--	(75)			
Belize	8.45	2005	12-65	B1	--	(76)	11.7	2005	12-65	B1	--	(76)	--	--	--
	13.4	2002	12-19	B2	10	(77)	20.5	2002	12-19	B2	10	(77)			
Bermuda	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(72)
British Virgin Islands	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(72)
Cayman Islands	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(72)

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Cuba	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use and cultivation	D2	(78)
Dominica	17.92	NR	11-19	B2	--	(79)	28.19	NR	17-19	B2	--	(79)	--	--	--
Dominican Republic	1.1	2003	12-19	B2	9	(80)	--	--	--	--	--	--	--	--	--
French Guiana	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(72)
Grenada	15.9	2005	13-17	B2	--	(81)	27.5	2005	13-17	B2	--	(81)	--	--	--
Guadaloupe	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(72)
Guyana	3.6	2002	12-19	B2	10	(77)	7.1	2002	12-19	B2	10	(77)	--	--	--
Haiti	1.4	2005	11-25	B2	--	(82)	3	2005	11-25	B2	--	(82)	--	--	--
Jamaica	13.87	2006	14-17	B2	--	(83)	27.62	2006	14-17	B2	--	(83)	--	--	--
Martinique	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(54)
Montserrat	--	--	--	--	--	--	--	--	--	--	--	--	Drug trafficking	D2	(53)
Netherlands Antilles	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(54)
Saint Kitts and Nevis	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	B2	(84)
Saint Lucia	16.0	2005	11-20	B2	8	(85)	25.6	2005	11-20	B2	8	(85)	--	--	--
Saint Vincent	11.72	2006	13-17	B2	--	(86)	17.76	2005	13-17	B2	--	(86)	--	--	--
Suriname	4.1	2006	13-17	B2	--	(87)	6.8	2006	13-17	B2	--	(87)	--	--	--
Trinidad and Tobago	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	B2	(84)
Turks and Caicos Islands	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
EUROPE, CENTRAL															
Albania	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(54)
Bosnia and Herzegovina	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Bulgaria	2.6 12	2003-2006 2006	18+ 15	B1 B2	-- 13	(36) (88)	11.8 18.65	2003-2006 2006	18+ 15	B1 B2	-- 11	(36) (89)	--	--	--

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Croatia	10	2006	15	B2	13	(88)	13.7	2006	15	B2	11	(89)	--	--	--
Czech Republic	9.3	2004	18-64	B1	9.3	(90, 91)	20.6	2004	18-64	B1	9	(90, 91)	--	--	--
	18	2006	17-19	B2	13	(88)	24.83	2006	15	B2	13	(89)			
Hungary	3.9	2003	15-54	B1	10	(91)	9.8	2003	15-54	B1	10	(91)	--	--	--
	9	2006	15	B2	13	(88)	9	2006	15	B2	11	(89)			
Poland	2.7	2006	15-64	B1	10	(91)	9.0	2006	15-64	B1	10	(91)	--	--	--
	13	2006	15	B2	13	(88)	18.46	2006	15	B2	11	(89)			
Romania	0.1	2005-2006	18+	B1	--	(36)	1.3	2005-2006	18+	B1	--	(36)	--	--	--
	2	2006	15	B2	13	(88)	2.89	2006	15	B2	11	(89)			
Serbia and Montenegro	9.1	2005	16	B2	11	(92)	12.9	2005	16	B2	11	(92)	--	--	--
Slovakia	6.9	2006	15-64	B1	10	(91)	16.1	2006	15-64	B1	10	(91)	--	--	--
	11	2006	15	B2	13	(88)	17.67	2006	15	B2	11	(89)			
Slovenia	12	2006	15	B2	13	(88)	17.72	2006	15	B2	11	(89)	--	--	--
The Former Yugoslav Republic of Macedonia	2	2006	15	B2	13	(88)	8	2003	15-16	B2	11	(93)	--	--	--
EUROPE, EASTERN															
Belarus	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Estonia	4.6	2003	15-69	B1	10	(91)	--	--	--	--	--	--	--	--	--
	19	2006	15	B2	13	(88)	24.9	2006	15	B2	11	(89)			
Latvia	3.8	2003	15-64	B1	10	(91)	10.6	2003	15-64	B1	10	(91)	--	--	--
	12	2006	15	B2	13	(88)	21.32	2006	15	B2	11	(89)			
Lithuania	2.2	2004	15-64	B1	10	(91)	7.6	2004	15-64	B1	10	(91)	--	--	--
	8	2006	15	B2	13	(88)	14.63	2006	15	B2	11	(89)			
Republic of	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	E	(94)

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Moldova															
Russian Federation	16	2007	15-16	B2	13	(30)	22	2003	15-16	B2	13	(30)	--	--	--
Ukraine	1	2002	18+	B1	--	(36)	6.4	2002	18+	B1	--	(36)	--	--	--
	8	2006	15	B2	13	(88)	21	2003	15-16	B2	13	(30)			
EUROPE, WESTERN															
Andorra	--	--	--	--	--	--	--	--	--	--	--	--	Drug trafficking	D2	(7)
Austria	7.5	2004	15-64	B1	10	(91)	20.1	2004	15-64	B1	10	(91)	--	--	--
	9	2006	15	B2	13	(88)	12.95	2006	15	B2	11	(89)			
Belgium	5	2004	15-64	B1	10	(91)	13	2004	15-64	B1	10	(91)	--	--	--
	27	2003	15-16	B2	13	(30)	32	2003	15-16	B2	13	(30)			
Channel Islands	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cyprus	1.4+	2006	15-64	B1	10	(91)	6.6	2006	15-64	B1	10	(91)	--	--	--
	3	2003	15-16	B2	13	(30)	4	2003	15-16	B2	13	(30)			
Denmark	5.2	2005	16-64	B1	10	(91)	36.5	2005	16-64	B1	10	(91)	--	--	--
	10	2006	15	B2	13	(88)	16.3	2006	15	B2	11	(89)			
Faeroe Islands	4	2003	15-16	B2	13	(30)	9	2003	15-16	B2	13	(30)	--	--	--
Finland	3.6	2006	15-64	B1	10	(91)	14.3	2006	15-64	B1	10	(91)	--	--	--
	5	2006	15	B2	13	(88)	7.21	2006	15	B2	11	(89)			
France	8.6	2005	15-64	B1	9	(91)	30.6	2005	15-64	B1	9	(91)	--	--	--
	21	2006	15	B2	13	(88)	27.35	2006	15	B2	11	(89)			
Germany	4.7	2006	15-64	B1	10	(91)	23	2006	15-64	B1	10	(91)	--	--	--
	11	2006	15	B2	13	(88)	15.94	2006	15	B2	11	(89)			
Gibraltar	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizure	D2	(95)
Greece	1.7	2004	15-64	B1	10	(91)	8.9	2004	15-64	B1	10	(91)	--	--	--
	3	2006	15	B2	13	(88)	3.52	2006	15	B2	11	(89)			
Greenland	10	2006	15	B2	13	(88)	27	2003	15-16	B2	12	(30)	--	--	--
Holy See	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Iceland	7	2006	15	B2	13	(88)	8.8	2006	NR	B2	9	(96)	--	--	--
Ireland	6.3	2006-	15-64	B1	12	(91)	21.9	2006-	15-64	B1	12	(91)	--	--	--
	17	2007	15	B2	13	(88)	23.82	2007	15	B2	11	(88)			

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		2006						2006							
Isle of Man	34	2003	15-16	B2	13	(30)	39	2003	15-16	B2	13	(30)	--	--	--
Israel	3.3	2003-	21+	B1	--	(36)	11.4	2003-	21+	B1	--	(36)	--	--	--
	3	2004	15	B2	13	(88)	--	2004	--	--	--	--			
		2006						--							
Italy	11.2	2005	15-64	B1	10	(91)	29.3	2005	15-64	B1	10	(91)	--	--	--
	17	2006	15	B2	13	(88)	20.96	2006	15	B2	11	(89)			
Liechtenstein	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	B3	(97)
Luxembourg	18	2006	15	B2	13	(88)	23.23	2006	15	B2	11	(89)	--	--	--
Malta	0.8	2001	15-64	B1	10	(91)	3.5	2001	15-64	B1	10	(91)	--	--	--
	10	2006	15	B2	13	(88)	12.61	2006	15	B2	11	(89)			
Monaco	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)
Netherlands	5.4	2005	15-64	B1	10	(91)	22.6	2005	15-64	B1	10	(91)	--	--	--
	19	2005	15	B2	13	(88)	23.83	2005	15	B2	11	(89)			
Norway	4.6	2006	15-64	B1	10	(91)	16.2	2006	15-64	B1	10	(91)	--	--	--
	6	2003	15-16	B2	13	(30)	9	2003	15-16	B2	13	(30)			
Portugal	3.6	2007	15-64	B1	10	(91)	11.7	2007	15-64	B1	10	(91)	--	--	--
	7	2006	15	B2	13	(88)	9.12	2006	15	B2	11	(89)			
Saint Pierre et Miquelon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
San Marino	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Spain	10.1	2006-	15-64	B1	10	(99)	27.3	2006-	15-64	B1	10	(99)	--	--	--
	23	2007	15	B2	13	(88)	30.24	2007	15	B2	11	(89)			
		2006						2006							
Sweden	2	2006	16-64	B1	10	(91)	12	2006	16-64	B1	10	(91)	--	--	--
	3	2005	15	B2	13	(88)	4.29	2006	15	B2	11	(89)			
Switzerland	23	2006	15	B2	13	(88)	40	2003	15-16	B2	13	(30)	--	--	--
United Kingdom	10.3	2004	16-59	B1	10	(91)	29.6	2004	16-59	B1	10	(91)	--	--	--
	31	2003	15-16	B2	13	(30)	38	2003	15-16	B2	13	(30)			
LATIN															

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AMERICA, ANDEAN															
Bolivia	1.7	2005	12+	B1	--	(100)	6.2	2005	B1	12+	--	(100)	--	--	--
	--	--	--	--	--	--	2.3	2005	B2	12-19	--	(101)			
Ecuador	4.1	2005	13-17	B2	--	(102)	7.9	2005	13-17	B2	--	(102)	--	--	--
Peru	2.68	2005	13-17	B2	--	(103)	4.61	2005	13-17	B2	--	(103)	--	--	--
LATIN AMERICA, CENTRAL															
Colombia	2	2003	18+	B1	--	(36)	11.5	2003	18+	B1	--	(36)	--	--	--
	7.1	2005	12-19	B2	--	(101)	7.6	2004	13-17	B2	--	(104)			
Costa Rica	4.6	2006	13-17	B2	--	(105)	7.4	2006	13-17	B2	--	(105)	--	--	--
El Salvador	0.35	2005	12-65	B1	--	(106)	6.09	2005	12-65	B1	--	(106)	--	--	--
	2.5	2003	12-19	B2	9	(80)	--	--	--	--	--	--			
Guatemala	0.13	2005	12-64	B1	--	(107)	2.79	2005	12-64	B1	--	(107)	--	--	--
	2.3	2003	12-19	B2	9	(80)	--	--	--	--	--	--			
Honduras	1.06	2005	12-17	B2	--	(108)	2.86	2005	12-17	B2	--	(108)	--	--	--
Mexico	1.2	2001-	18+	B1	--	(36)	7.8	2001-	18+	B1	--	(36)	--	--	--
	1.6*	2002 2005	15-19	B2	11	(109)	2.4*	2002 2005	15-19	B2	11	(109)			
Nicaragua	1.06	2006	12-65	B1	--	(110)	7.91	2006	12-65	B1	--	(110)	--	--	--
	2.2	2003	12-19	B2	9	(80)	--	--	--	--	--	--			
Panama	7.1	2003	12-14	B2	9	(80)	--	--	--	--	--	--	--	--	--
Venezuela	1.04	2005	13-17	B2	--	(111)	1.48	2005	13-17	B2		(111)	--	--	--
LATIN AMERICA, SOUTHERN															
Argentina	6.9	2006	12-65	B1	--	(112)	15.8	2006	12-65	B1	--	(112)	--	--	--
	5.4	2006	13-17	B2	--	(112)	8.7	2006	13-17	B2	--	(112)			
Chile	7.0	2006	12-64	B1	--	(113)	24.3	2006	12-64	B1	--	(113)	--	--	--
	12.7	2005	12-19	B2	--	(101)	19.9	2006	NR	B2	--	(113)			
Falkland Islands	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	C2	(114)

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(Malvinas)															
Uruguay	5.2 9.7	2006 2005	12-65 12-19	B1 B2	-- 9	(115) (80)	12.2 --	2006 --	12-65--	B1 --	-- --	(115) --	--	--	--
LATIN AMERICA, TROPICAL															
Brazil	1.5 5.1	2004-2006 2005	18+ 12-19	B1 B2	-- --	(36) (116)	11.8 --	2004-2006 --	18+ --	B1 --	-- --	(36) --	--	--	--
Paraguay	2.7	2005	12-19	B2	--	(101)	4.2	2005	NR	B2	--	(117)	--	--	--
NORTH AFRICA / MIDDLE EAST															
Algeria	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Bahrain	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Egypt	--	--	--	--	--	--	72.8	2003	NR	B3	8	(118)	--	--	--
Iran (Islamic Republic of)	--	--	--	--	--	--	1*	2001	13-24	B2	11	(119)	--	--	--
Iraq	0	2007-2008	18+	B1	--	(36)	0	2007-2008	18+	B1	--	(36)	--	--	--
Jordan	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Kuwait	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Lebanon	1.1	2002-2003	18+	B1	--	(36)	4.6	2002-2003	18+	B1	--	(36)	--	--	--
Libyan Arab Jamahiriya	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Morocco	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)

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Region/Country	Use: Past Year Prevalence (95% CI)	Year of estimate	Age	Grade	Quality score	Source(s)	Use: "Lifetime Prevalence"** (95% CI)	Year of estimate	Age	Grade	Quality Score	Source(s)	Type of evidence of any use for countries with no prevalence estimate available	Grade	Any Evidence of Use Source
Occupied Palestinian Territory	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	E	(120)
Oman	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Qatar	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Saudi Arabia	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	C2	(121)
Syrian Arab Republic	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Tunisia	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	B4	(122)
Turkey	3	2003	15-16	B2	13	(30)	4	2003	15-16	B2	13	(30)	--	--	--
United Arab Emirates	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(54)
Western Sahara	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Yemen	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
NORTH AMERICA, HIGH INCOME															
Canada	14.1	2004	15+	B1	10	(34)	44.5	2004	15+	B1	10	(34)	--	--	--
	26.5*	2007	12-18	B2	10	(22)	18	2002	15	B2	--	(123)			
United States of America	10.1	2007	12+	B1	13	(51)	40.6	2007	12+	B1	13	(51)	--	--	--
	31.74	2001	15	B2	--	(31)	35.58	2001	15	B2	--	(31)			
OCEANIA															
American Samoa	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	E	(116)
Cook Islands	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fiji	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
French Polynesia	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	B4	(124)
Guam	--	--	--	--	--	--	--	--	--	--	--	--	Imputed estimate^	B2	(125)
Kiribati	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Region/Country	Use: Past Year Prevalence (95% CI)	Year of estimate	Age	Grade	Quality score	Source(s)	Use: "Lifetime Prevalence"** (95% CI)	Year of estimate	Age	Grade	Quality Score	Source(s)	Type of evidence of any use for countries with no prevalence estimate available	Grade	Any Evidence of Use Source
Marshall Islands	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Micronesia (Federated States of)	--	--	--	--	--	--	4.1	2005	15	B2	11	(126)	--	--	--
Nauru	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
New Caledonia	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Niue	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Northern Mariana Islands	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	D2	(127)
Palau	--	--	--	--	--	--	--	--	--	--	--	--	Drug trafficking	E	(128)
Papua New Guinea	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Pitcairn	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Samoa	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures and trafficking	D2	(128)
Solomon Islands	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures and trafficking	D2	(128)
Tokelau	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tonga	--	--	--	--	--	--	1.9	2005	15	B2	10	(126)	--	--	--
Tuvalu	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanuatu	--	--	--	--	--	--	1.47	2005	15	B2	10	(126)	--	--	--
Wallis and Futuna Islands	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SUB-SAHARAN AFRICA, CENTRAL															
Angola	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Central African Republic	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)

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Region/Country	Use: Past Year Prevalence (95% CI)	Year of estimate	Age	Grade	Quality score	Source(s)	Use: "Lifetime Prevalence"** (95% CI)	Year of estimate	Age	Grade	Quality Score	Source(s)	Type of evidence of any use for countries with no prevalence estimate available	Grade	Any Evidence of Use Source
Congo	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)
Democratic Republic of the Congo	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	E	(129)
Equatorial Guinea	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Gabon	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)
SUB-SAHARAN AFRICA, EAST															
Burundi	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Comoros	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Djibouti	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Eritrea	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)
Ethiopia	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	C2	(130)
Kenya	0.6*	1990	10+	B1	4	(131)	--	--	--	--	--	--	--	--	--
Madagascar	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Malawi	--	--	--	--	--	--	--	--	--	--	--	--	Reports of production	D2	(53)
Mozambique	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures, trafficking and use	D2	(54)
Rwanda	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)
Somalia	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Sudan	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)

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Region/Country	Use: Past Year Prevalence (95% CI)	Year of estimate	Age	Grade	Quality score	Source(s)	Use: "Lifetime Prevalence"** (95% CI)	Year of estimate	Age	Grade	Quality Score	Source(s)	Type of evidence of any use for countries with no prevalence estimate available	Grade	Any Evidence of Use Source
Uganda	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
United Republic of Tanzania	10.1*	2001	NR	NR	6	(132)	14.4*	2001	NR	NR	6	(132)	--	--	--
Zambia	7.3*	2001	NR	NR	6	(132)	13.8*	2001	NR	NR	6	(132)	--	--	--
SUB-SAHARAN AFRICA, SOUTHERN															
Botswana	--	--	--	--	--	--	--	--	--	--	--	--	Drug arrests	D2	(133)
Lesotho	--	--	--	--	--	--	--	--	--	--	--	--	Drug arrests and treatment	D2	(133)
Namibia	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
South Africa	4.1 8.9*+	2002-2003 2004	18+ 16	B1 B2	-- 8	(36) (134)	8.4 12.8	2002-2003 2002	18+ 12-20	B1 B2	-- 11	(36) (135)	--	--	--
Swaziland	--	--	--	--	--	--	--	--	--	--	--	--	Drug arrests and treatment	D2	(133)
Zimbabwe	--	--	--	--	--	--	8.2	1990	12-21	B2	9	(136)	--	--	--
SUB-SAHARAN AFRICA, WEST															
Benin	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Burkina Faso	0.3	2006	13-17	B2	--	(32)	1.4	2006	13-17	B2	--	(32)	--	--	--
Cameroon	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	C2	(137)
Cape Verde	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Chad	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Cote d'Ivoire	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(53)

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Gambia	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	B4	(138)
Ghana	--	--	--	--	--	--	1.7	2001	13-24	B2	9	(139)	--	--	--
Guinea	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Guinea-Bissau	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Liberia	--	--	--	--	--	--	--	--	--	--	--	--	Evidence of use	D1	(140)
Mali	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Mauritania	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Niger	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Nigeria	0.4	2002-2004	18+	B1	--	(36)	2.7	2002-2004	18+	B1	--	(36)	--	--	--
	--	--	--	--	--	--	28*	1993	12-20	B2	7	(141)			
Saint Helena	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Sao Tome and Principe	--	--	--	--	--	--	--	--	--	--	--	--	Drug seizures	D2	(98)
Senegal	--	--	--	--	--	--	1.4*	2007	NR	B2	--	(142)	--	--	--
Sierra Leone	--	--	--	--	--	--	--	--	--	--	--	--	Imputed by UNODC^	C2	(7)
Togo	0.6	2007	14-16	B2	--	(143)	1	2007	14-16	B2	--	(143)	--	--	--

Note. NR=Not reported, ^ no further information available, *sub-national data available in the absence of national data. **We have used the term "Lifetime prevalence" of dependence or use to indicate cumulative probability for that parameter to aid in communication as this is the most commonly used nomenclature in the reviewed data. + Past month prevalence. # Only males included

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4. DISCUSSION

4.1 Summary

Cannabis is the most commonly produced, trafficked and used illicit drug worldwide, and its use can generate substantial demand for assistance to stop using (7). Cannabis dependence is increasingly recognised as an issue by policy makers but, as this review has shown, there are few data available globally on its prevalence. Only seven countries - comprising 25% of the world's population aged 15-64 years – have reported cannabis dependence estimates. Dependence estimates from the general population ranged from 0.1% to 9.4%, with widely varying age ranges; estimates from school surveys ranged from 2.7% to 10%, across varied samples. Only three countries reported national estimates (Australia, the United Kingdom and the United States).

Prevalence estimates of cannabis use are more common: data is available for all countries that report dependence estimates and 88 others. This means that we are missing estimates of cannabis use on less than one percent of the world's population. There is wide variation in the estimates of use. The highest point prevalence estimate of cannabis use of young people was reported from the Isle of Man (34%; (30)) followed by the United States (31.74%; (31)) and the United Kingdom (31%; (30)). The highest point prevalence estimate in the general population (14.1%) was reported by both Canada (34) and Bangladesh (35).

Almost double the number of countries that reported general population estimates (58 countries) reported estimates of young peoples' cannabis use (90 countries). This probably reflects the greater ease of surveying a large geographically varied sample of young people at a low cost. Although school surveys do provide important information on prevalence of use among young people, these estimates are not applicable to use in the general population and may underestimate use among young people in all countries. In developed countries those not attending school have been reported to have higher rates of cannabis use (37), while the representativeness of school samples in developing countries - where school participation may be relatively rare - is likely to be less. As this review shows school survey estimates are often higher than general population estimates for a given country, although this may at least partially reflect cohort differences.

4.2 Limitations due to measurement differences across existing studies

Cannabis use was defined differently in different surveys. It was commonly reported as "cannabis", which included different preparations, such as marijuana and hashish. Other studies reported separate prevalence estimates for marijuana and hashish. This paper only includes estimates of cannabis or marijuana use or dependence; hashish only estimates are not included.

Other methodological limitations may preclude meaningful comparisons across studies and countries. These include variations in: population survey methodology (varying from census to random digit dialling); sample response rates; reported age ranges; and use of national vs. sub-national samples when there are probable geographic variations in cannabis use or dependence; and a lack of consistent time periods for measurement of use ("lifetime" vs. past year vs. past month). Future research needs to increase the coverage of estimates for different populations and ensure that these estimates are valid. Standardised methods have been developed for population surveys of alcohol (38-40),

tobacco (41) and illicit drug use (42), but there has been limited use of these protocols, which were developed in high income, high capacity countries, in countries with fewer resources (40, 43). The two regions that have put the greatest effort into cross-nationally comparable studies have been Europe, under the guidance of the European Monitoring Centre on Drugs and Drug Addiction (44-47), and the Americas (e.g. (48)). Given the gaps in data on use in Asian countries, there is a need for more work in this regard.

There is also a need to look critically at estimates derived from surveys of drug use relying on self-reports. These estimates will only be accurate if a representative sample is obtained, people honestly disclose their drug use, and drug users are spread evenly around the country – and these conditions are often not met. Marginalised groups who have higher levels of drug use, are typically excluded (e.g. those who are homeless, imprisoned or in treatment facilities). Despite valid and reliable self-report data being possible using correct methodologies that carefully provide anonymity, the extent to which surveys in different countries have conformed to these methodologies is uncertain. People may also feel uncomfortable disclosing illegal behaviours (in ways that probably vary across countries and cultures), particularly in societies where participants fear reprisals for admitting to an illegal behaviour. It may also be affected by the type of interviewer, particularly if they are a law enforcement or government official, an approach used in some countries. Finally, drug use is often geographically concentrated, and random sample surveys may not be able to take this into account.

The gaps in data documented in this review were concentrated among low and middle income countries. These countries may often lack the resources and expertise to undertake population level assessments of illicit drug use. There is an imperative – endorsed by a recent meeting of the Commission on Narcotic Drugs (49) – to assist countries to collect better data on cannabis and other illicit drug use and dependence. Better data on patterns of cannabis use will increase the likelihood that scarce resources for treatment and prevention are appropriately targeted – at the right age groups, and scaled up to the levels required.

4.3 Limitations of this review

Our review was subject to limitations (see longer discussion of these in (16)). One was the lag between when research was conducted and results published in peer-reviewed journals. We addressed this by using multiple methods of sourcing and locating "grey" literature and by surveying experts about unpublished studies. The latter was a very important source for this review, with a majority of the estimates sourced from the grey literature. Grey literature reports are, however, difficult to access and many are not available in English. Concerted efforts are needed to make these sources of information more available electronically (see (19)). English language documents were primarily reviewed but the abstracts of many non-English language peer-reviewed articles were also reviewed when available in English; translation was undertaken where papers appeared relevant. Furthermore, estimates were also reviewed by UN staff with access to non-English language material.

4.4 Conclusions

Despite cannabis being the most prevalent drug, there is a lack of good evidence on patterns of cannabis use and dependence across most countries worldwide. Dependence estimates are sparser than estimates of use, with only three countries reporting national estimates of the prevalence of cannabis dependence. It is important that these gaps in the

literature are reduced by the collection of data that are reported transparently and regularly to permit comparisons between countries and over time. Accurate estimates of cannabis use and dependence are essential for informing policy.

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APPENDIX A: SEARCH STRINGS FOR PEER REVIEWED SEARCHES

Database	Search group	Search terms
Medline*	Cannabis	Cannabis OR cannabin$ OR marijuana OR bhang OR ganga OR hashish OR hemp or cannabis indica OR cannabis sativa or hemp plant or marihuana Exp cannabis/
	Gold standard Epidemiology	"prevalence" OR "inciden$" OR "epidemiolog$" OR "history" or "patterns" OR "survey$" OR "data collection$" OR "screening" OR "cohort" OR "population study" OR "population sample" OR "surveillance" OR "community sample" OR "statistics" OR "duration" OR "severity" OR "chronic" OR "long-term" OR "prolonged" exp Epidemiology/ or Exp prevalence/ or exp Incidence/ or exp sex distribution/ or exp age distribution/ or exp epidemiologic methods/ or exp ethnology/ or exp Statistics/ or exp data collection/ or exp health surveys/ or exp health care surveys/ or exp interviews/ or exp narration/ or exp questionnaires/ or exp records/ or exp registries/ or exp disease notification/ or exp epidemiologic studies/ or exp cohort studies/ or exp longitudinal studies/ or exp follow-up studies/ or exp prospective studies/ or exp cross-sectional studies/ or exp sampling studies/ or exp focus groups/
	Basic epidemiology	(inciden$ or prevalen$ or epidemiolog$) Exp Epidemiology/ or exp prevalence/ or exp Incidence/
	Cohort	"cohort" OR "longitudinal" OR "incidence" OR "prospective" OR "follow-up" exp cohort studies/ or exp longitudinal studies/ or exp follow-up studies/ or exp prospective studies/
	Drug Use	drug abuse$ OR drug use$ OR drug misuse$ OR drug dependenc$ OR substance abuse$ OR substance use$ OR substance misuse$ OR substance dependenc$ OR addict$ Exp Substance-related disorders/
EMBASE#	Cannabis	Cannabis OR cannabin$ OR marijuana OR bhang OR ganga OR hashish OR hemp or cannabis indica OR cannabis sativa or hemp plant or marihuana Exp cannabis addiction/ or exp cannabis smoking/ or exp cannabis/ or exp cannabis derivative/
	Gold standard Epidemiology	"prevalence" OR "incidence" OR "epidemiolog$" OR "data collection" Or "Survey" OR "surveillance" OR "screening" OR "population study" OR "population sample" OR "population survey" OR "population surveillance" OR "community sample" OR "RAR" OR "rapid assessment" OR "situation$ assessment" OR "statistics" exp PREVALENCE/ or exp INCIDENCE/ or exp EPIDEMIOLOGY/ or exp Age Distribution/ or exp Sex Difference/ or exp biostatistics/ or exp health statistics/ or

Database	Search group	Search terms
		exp epidemiological data/ or exp geographic distribution/ or exp field study/ or exp observational study/ or exp panel study/ or exp pilot study/ or exp prevention study/ or exp trend study/ or exp case finding/ or exp exploratory research/ or exp multimethod study/ or exp naturalistic inquiry/ or exp qualitative research/ or exp quantitative study/ or exp sample size/ or exp secondary analysis/ or exp technique/ or exp triangulation/ or exp "medical record review"/ or exp semi structured interview/ or exp structured interview/ or exp unstructured interview/ or exp observational method/ or exp questionnaire/ or exp open ended questionnaire/ or exp structured questionnaire/ or exp model/
	Basic Epidemiology	(inciden$ or prevalen$ or epidemiolog$) Exp Epidemiology/ or exp prevalence/ or exp Incidence/
	Cohort	"cohort" OR "longitudinal" OR "incidence" OR "prospective" OR "follow-up" exp COHORT ANALYSIS/ or exp LONGITUDINAL STUDY/ or exp PROSPECTIVE STUDY/ or exp Follow Up/
	Drug Use	Drug abuse OR drug use$ OR drug misuse OR drug dependenc$ OR substance abuse OR substance use$ OR substance misuse OR substance dependenc$ OR addict$ exp substance abuse/ or exp drug abuse/ or exp analgesic agent abuse/ or exp drug abuse pattern/ or exp drug misuse/ or exp drug traffic/ or exp multiple drug abuse/ or exp addiction/ or exp drug dependence/ or exp cannabis dependence/ or narcotic dependence/ or exp heroin dependence/ or exp morphine addiction/ or exp opiate addiction/
PsychINFO^	Cannabis	Cannabis or cannabin$ or marijuana or bhang or ganga or hashish or hemp or cannabis indica or cannabis sativa or hemp plant or marihuana
		exp CANNABIS/ or exp MARIJUANA USAGE/ or exp MARIJUANA/
	Gold standard epidemiology	"prevalence" OR "incidence" OR "epidemiolog$" OR "data collection" Or "Survey" OR "surveillance" OR "screening" OR "population study" OR "population sample" OR "population survey" OR "population surveillance" OR "community sample" OR "RAR" OR "rapid assessment" OR "situation$ assessment" OR "statistics" Exp epidemiology/ or exp STATISTICS/ or exp "POPULATION (STATISTICS)"/ or exp disease course/ or exp statistical analysis/
	Basic epidemiology	Prevalen$ or inciden$ or epidemiolog$ Exp epidemiology/
	Mortality	Mortal$ or fatal$ or death$ exp "DEATH AND DYING"/ or exp Mortality/ or exp

Database	Search group	Search terms
		Hospitalization
	Cohort	"cohort" OR "longitudinal" OR "incidence" OR "prospective" OR "follow-up" Exp age differences/ or exp cohort analysis/ or exp human sex differences
	Drug Use	Drug abuse OR drug use$ OR drug misuse OR drug dependenc$ OR substance abuse OR substance use$ OR substance misuse OR substance dependenc$ OR addict$ Exp drug abuse/ or exp drug addiction/ or exp addiction/ or exp drug usage

* 'key-words' in lowercase, 'MeSH' terms in bold
# 'key-words' in lowercase, 'EMTREE' terms in bold
^ 'key words' in lowercase, explode terms in bold

APPENDIX B: SEARCH STRING COMBINATIONS

	Search terms		Database		
			Medline	EMBASE	PsycINFO
1.	Cannabis	+ Gold epidemiology + drug use	3083	4953	2886
2.	Cannabis	+ Gold epidemiology + cohort + drug use	1018	1143	808
3.	Cannabis	+ Basic epidemiology + drug use	1174	2621	946
4.	Cannabis	+ Basic epidemiology + cohort + drug use	498	643	284

APPENDIX C: ILLICIT DRUGS QUALITY INDEX

1. Case ascertainment

2	• Nationwide survey/register/database (not for a specific population) • Multiple institutions/centres
1	• Regional • Case/death registers • One treatment institution/hospital etc.
0	• Not specified

2. Measurement instrument

3	• Interview/self-reported drug use (comment about reporting type, eg. self-report or standardised interview) • In treatment for drug dependence
2	• Systematic case note/database/reports review • Blood and/or urine toxicology screen
1	• Chart diagnosis
0	• Not specified

3. Diagnostic criteria

1	• Any diagnostic system reported for drug dependence or abuse (not use) eg., DSM, ICD, RDC (comment, eg. DSM) • Dependence inferred from type of sample population (comment, eg. treatment centre)
0	• Drug use • Own system • Symptoms described • No system • Not specified

4. Estimate

1	• Yes (comment on what type of estimate, eg. relative risk, SMR, prevalence, incidence)
0	• No

5. Numerator and denominator presented?

1	• Yes
0	• No

6. Numerator and denominator based on identical epochs and identical catchment areas?

1	• Yes
0	• No

7. Completeness of follow-up in cohort studies and response for cross-section studies

2	• High response rate/inclusion of defined sample population (>80%)
1	• Moderate response rate (60% - 79%) • Exclusions made
0	• Poor response rate (<60%)

8. Representative of the catchment area?

2	• Well represented • National registers • Multiple institutions across states
1	• Small area • Not representative of nation • One treatment centre • Registers of specific populations, eg. pilots
0	• Convenient sampling • Other (comment)

9. Age/sex specific values presented?

2	• Yes
1	• Some (eg. sex and 2 broad age ranges only)
0	• No

10. Quality of methods of reporting

Text	• Eg. translation of tools, interviewer's quality, quality control monitoring, limitations of data, high quality methods used etc

11. Duration of follow-up

Text	• Eg. Number of years at follow-up – small sample size over a number of years etc.

APPENDIX D: ACCESS DATABASE MANUAL AND DATA ENTRY RULES

Global Burden of Disease study: Overview

We are collecting data to generate regional estimates of:
Prevalence;
Incidence;
Remission;
Duration; and
mortality,
for 5 different types of drug dependence:
amphetamine-type stimulants (ATS);
benzodiazepine;
cannabis;
cocaine; and
heroin and other opioids.

Estimates need to be made for 1990 and 2005, reflecting the general population.

Ideally raw data should be used, however in cases where the study is a comparison against a survey that we cannot otherwise access, then it is appropriate to enter the reported (not raw) data but make sure that a comment is added in the estimates comment box (eg. "data from 2006 report") to note that this data is not raw and that it was used to avoid missing out on the data completely. Please keep note (on paper) of the years of data extracted from the report and give to XX.

Data extraction

- Endnote libraries contain the data sources that need to be extracted for each parameter (PDFs are attached to each reference).
- Prevalence and Incidence data sources will be in the same library
- Remission and duration sources will be in the same library
- Mortality sources are in their own library

Interns: please enter data into the **1st entry windows only**

Estimates will be entered as 1st Entry by the first person that looks at the data, then a second time in the 2nd Entry by the person who is looking at the data. The Final Entry will function to cross-check the data entered for a source. Make sure that the second entry of an estimate is matched with second entry of the same estimate.
Only enter raw data.
Do not process any calculations; only enter what is presented in the publication.
Once you start entering information from a data source, you must extract ALL the data from the data source (please do not partially enter data from a source).
Data must be entered in ALL fields. If a field is not applicable or data is missing, please enter "999" (see General GBD Database Rules).

If an article reports on data from more than one country – an entirely new entry needs to be created from the Studies Summary window
Once extracted, please make a note in the endnote library under Research Notes "extracted by *insert name here*, *insert date here dd month year*", eg. "extracted by Bianca Calabria, 16 June 2008".

If you start creating the final entries for a data source (automatically cross-checking the 2 previous entries or copying the first entry to the final entry), you must complete all the final entries of each estimate for that data source.

Prevalence and Incidence specifics:

RAW DATA ONLY

Many articles will report older data for comparisons. Please only extract the data which were the product of the **current** study or survey. However, at present (due to time constraints), when a report displays estimates from previous years of the same survey please extract all years of data. For previous survey year data enter a comment in the estimate comments box, "data from the 2006 report", for example. Please keep note (on paper) of the years of data extracted from the report and give to Bianca.

ALL PREVALENCE ESTIMATES

Drug use prevalence can be measured in several ways:
Lifetime Prevalence (LT) (ie: has the person ever tried the drug, even once)
Past year prevalence (PYP): has the person used the drug in the previous 12 months
Past month prevalence (PMP): also Past 30 day Prevalence (has the person used the drug in the last month/30 days)
For the GBD we are most interested in PMP, however, **we need to collect data on all three types of prevalence**, whenever they are reported. So, if an article reports on all three – please extract them ALL.

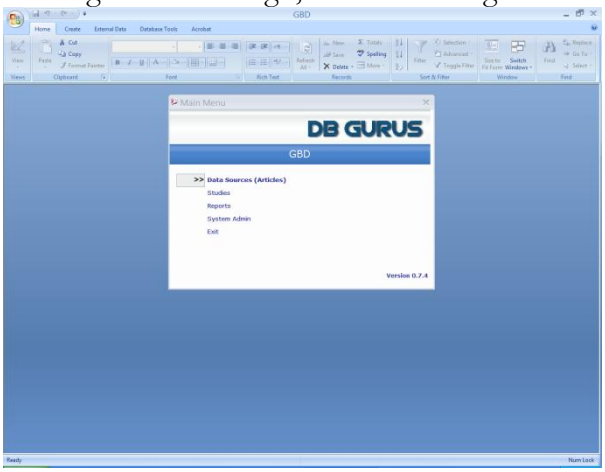
WEIGHTED AND UNWEIGHTED ESTIMATES

Some papers will report both weighted and unweighted estimates. Weighted estimates have been adjusted so that the sample is representative of the general population.
Please extract BOTH WEIGHTED and UNWEIGHTED.
Weighted estimates should have the Standardised box ticked, with a comment about how and why the statistics were weighted (if possible)

GBD Database Instructions

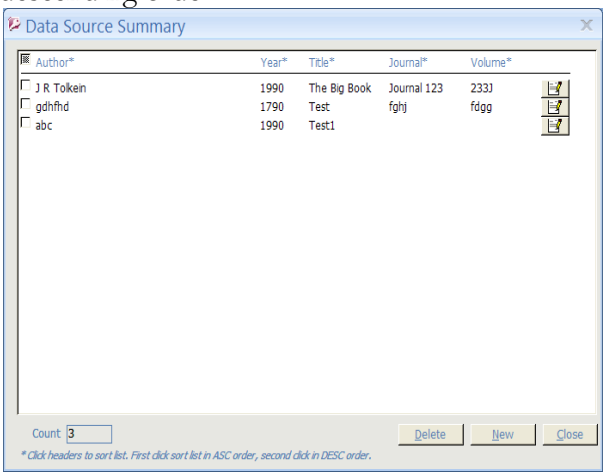
DO NOT USE ROLLER ON MOUSE

Open the GBD database (front end) file, to the main menu.
Clicking once is enough, double clicking is not necessary.



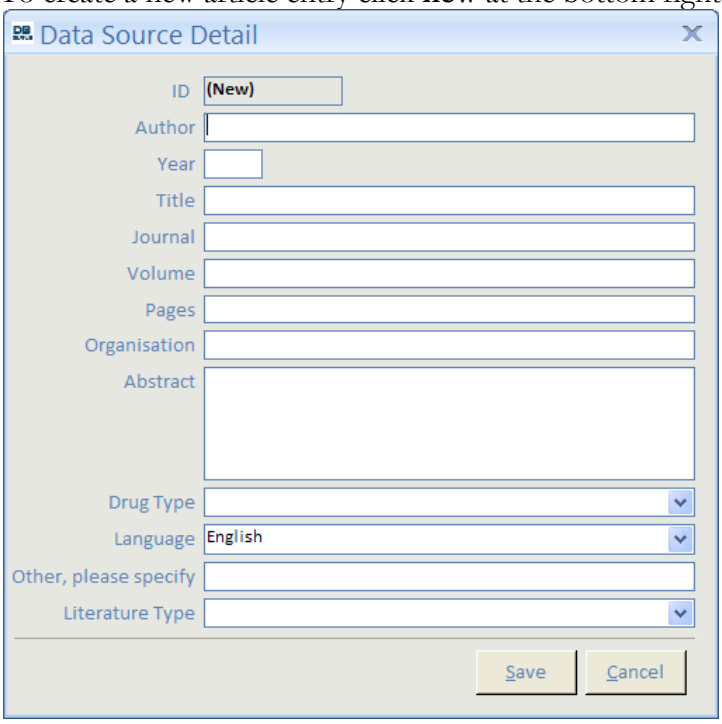
Data Source (Articles)

Click once on ***Data Sources (Articles)*** to view the ***Data Source Summary***.
Headers can be clicked once to sort lists in ascending order, a second click will sort in descending order.



Create a new article entry

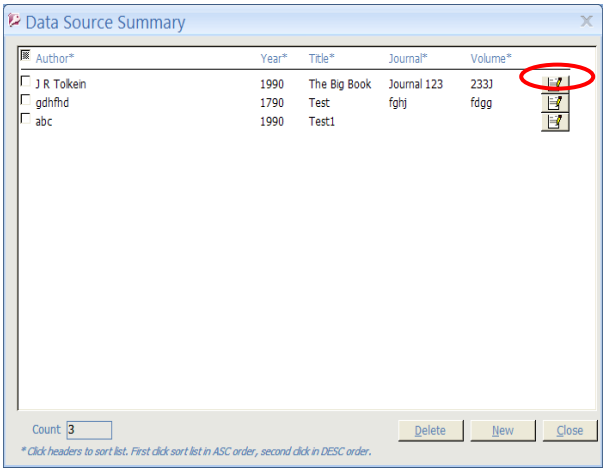
To create a new article entry click **new** at the bottom right of the screen.



Enter data in ALL fields, then click **save** and **close** (abstract field can be left blank).
Click **close** in the ***Data Source Summary*** screen to return to the main menu.

Edit an existing article entry

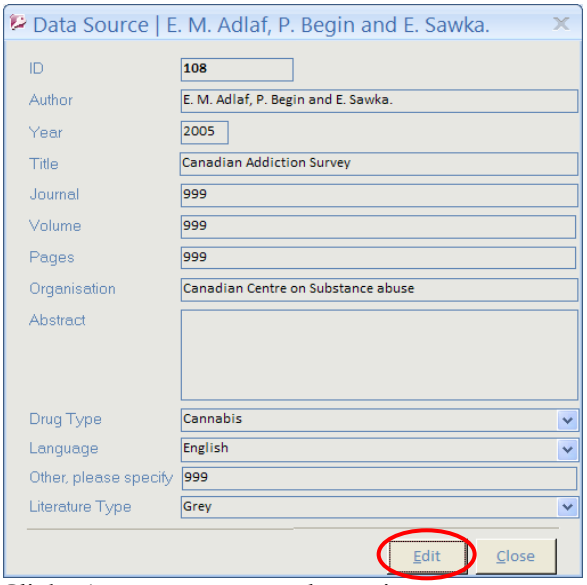
To edit an existing article entry click on the icon on the far right of the screen that is associated with the entry you wish to edit.



Then

Click **edit** on the bottom of the ***Data Source*** screen to edit existing information.

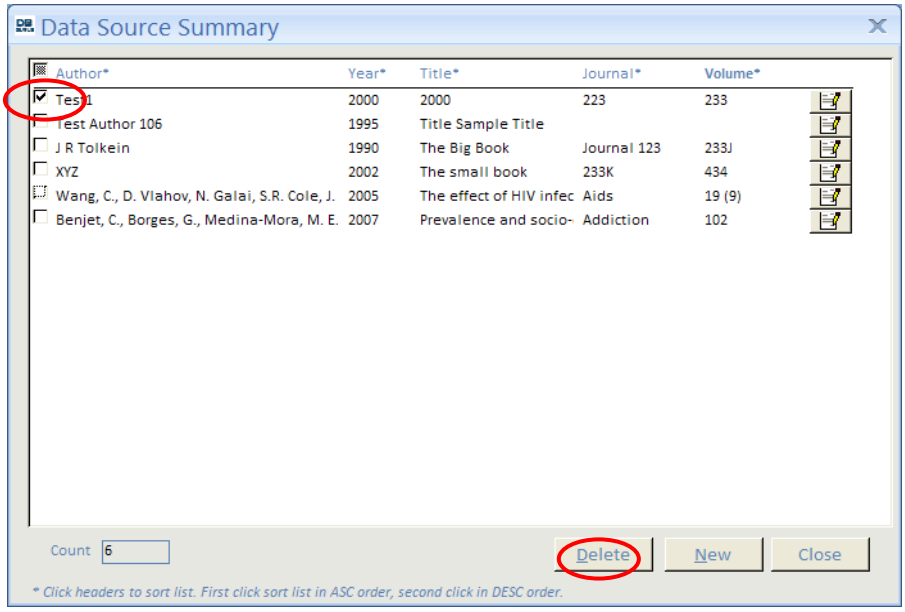
Click **save** and **close**.



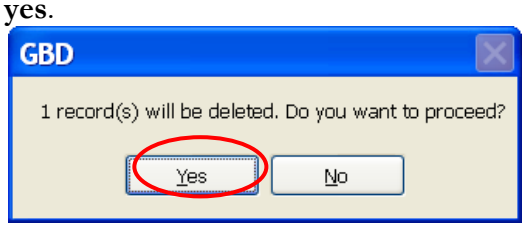
Click **close** to return to the main menu.

<u>Deleting report/article information</u>

In the ***Data Source Summary*** screen select the report/article you wish to delete by ticking the box to the left of the report/article information. Then click **delete** at the bottom right of the screen.



A message asking if you want to delete the specified report/article information will appear, click **yes**.

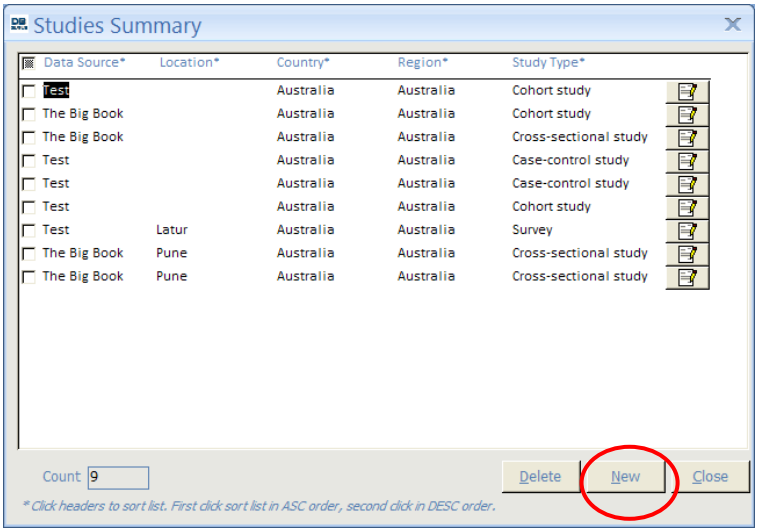


Studies

From the Main Menu click once on ***Studies*** to view the ***Studies Summary***.

Creating new study information (following on from creating new article entry)

To create a new study entry, that is new study information following on from entering the new article information, click **new** at the bottom right of the screen.



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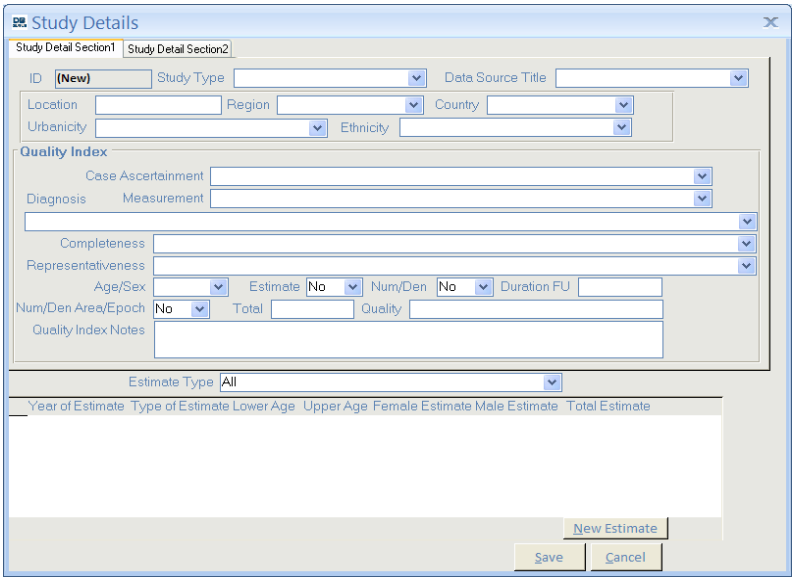
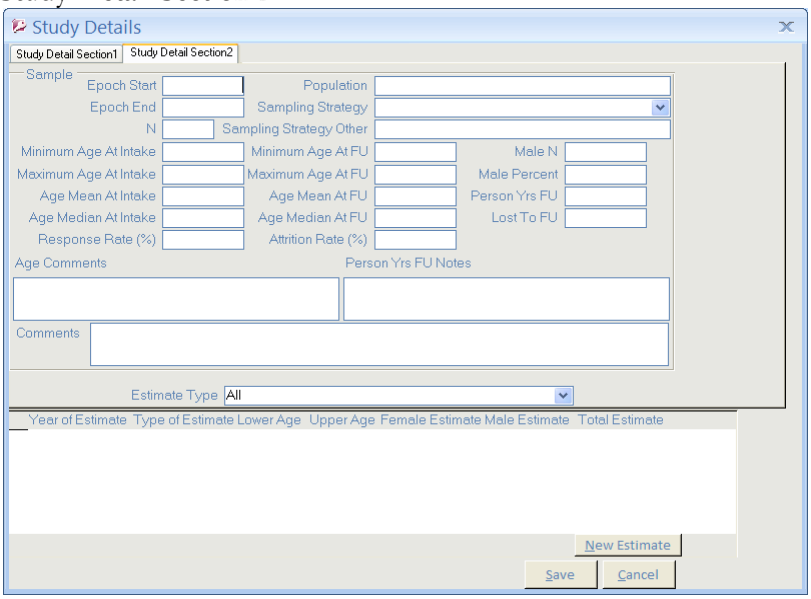
Study Detail Section 1

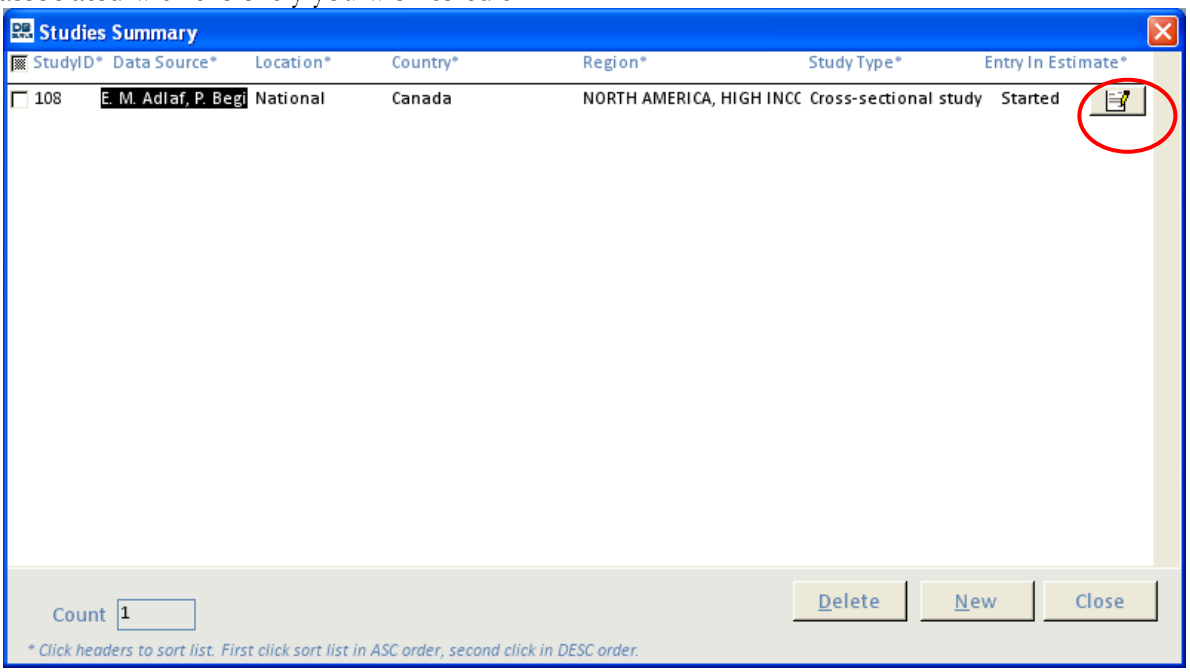


First select the authors of the particular article from the *Data Source Title* drop down box.
Enter data in ALL remaining fields on the ***Study Detail Section 1*** screen.
Select the ***Study Detail Section 2*** screen by clicking on the labelled tab at the top left of the screen.
Study Detail Section 2



Enter data in ALL fields on the ***Study Detail Section 2*** screen (including *Estimate Type*).
Click **save.**
<u>Reports/articles that present data on more than one country.</u>
Click **new** at the bottom right of the ***Studies Summary*** screen. Select the appropriate author/date from the ***Study Detail Section 1*** screen and enter data for one of the countries reported on. Click **save** and **close**.
To enter the data for a different country presented in the same report/article, need to make a new record. Click **new** from the Studies Summary screen, select the appropriate author/date in the ***Study Details Section 1*** screen and input data. Click **save** and **close**.
In the ***Studies Summary*** screen the data source will be displayed twice, with the different country shown for each display.
<u>Editing existing study information</u>

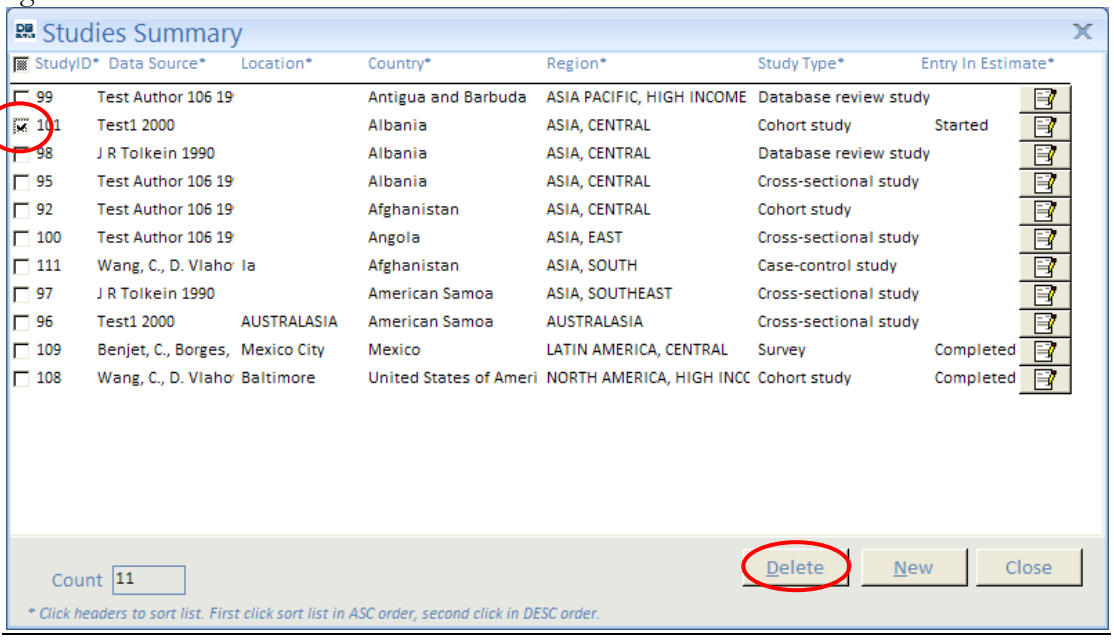
To edit existing study information click on the icon on the far right of the screen that is associated with the entry you wish to edit.



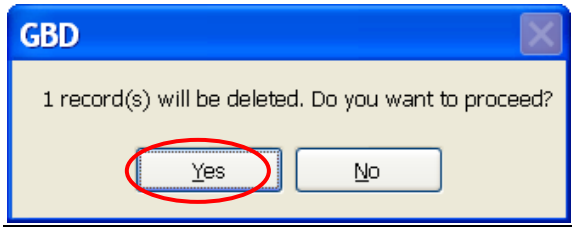
Click **edit** on the bottom of the ***Study Details*** screen to edit existing information (***Study Detail Section 1*** and ***Study Detail Section 2*** may both be edited, change between screens by clicking on the appropriately labelled tab at the top left of the screen).
Click **save** and **close**.

Deleting study information

In the ***Study Summary*** screen select the report/article you wish to delete study information for by ticking the box to the left of the report/article information. Then click **delete** at the bottom right of the screen.



A message asking if you want to delete the specified report/article information will appear, click **yes**.



Estimate Details

Creating a new estimate entry (following on from creating new study information)

In the Studies Summary screen, click on the icon on the far right of the screen that is associated with the entry you wish to add an estimate.

Click **edit**, at the bottom right of the ***Study Details*** screen.

Click **New Estimate**, at the bottom right of the ***Study Details*** screen.

The ***1st Entry*** radio button should be selected if this is the first time data has been extracted from an article/report, ***2nd Entry*** radio button should be selected if this is the second time data has been extracted from the same article/report (not by the same person that entered the 1st entry), the final entry functions to compare the 1st and 2nd entries.

Only estimate information is entered into the database in the second entry, however, article/report and study information should be visually checked for errors by the second person entering estimate information.

Once data has been entered in ALL the fields click save and close.

In the ***Study Details*** screen click **save** and **close** to return to the ***Studies Summary*** screen.

Deleting estimate information

To delete an estimate, open up the estimate and click the delete button situated at the bottom right of the box.

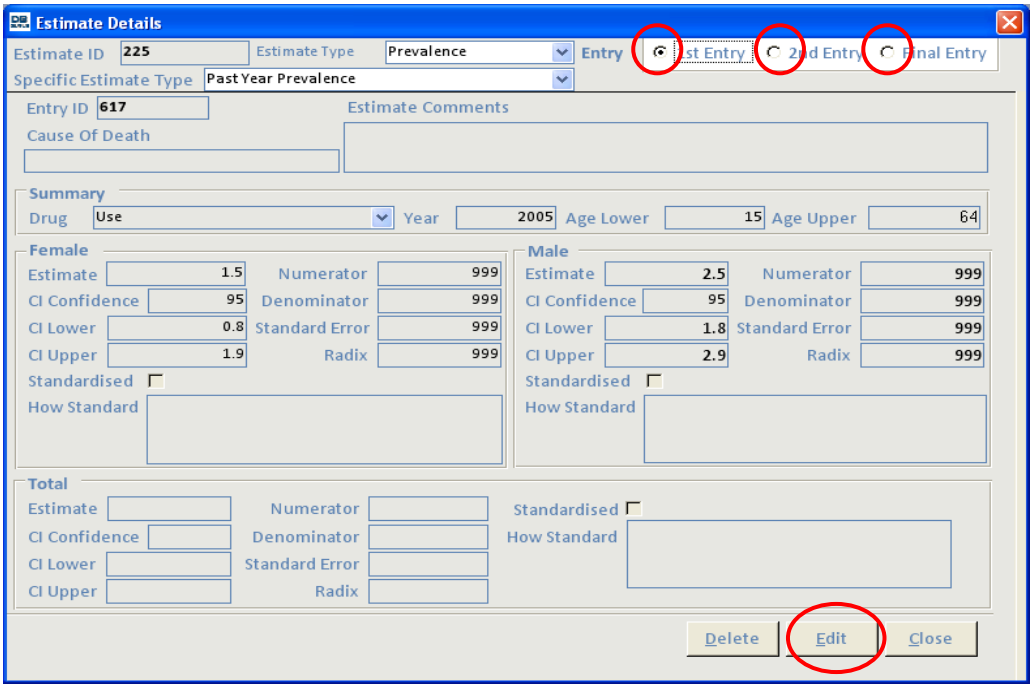
Comparing the 1st Entry and the 2nd Entry

In the ***Studies Summary*** screen, click on the icon on the far right of the screen that is associated with the entry for which estimates you would like to compare.

In the ***Study Details*** screen click **edit** at the bottom right of the screen.

In the estimate summary section at the bottom of the screen, click on the icon on the far right of the screen that is associated with the estimate that comparison of entries is required.

Check that both the 1st and 2nd entries have been completed by clicking the radio buttons at the top right of the screen. If both are complete click on the radio button for the ***Final Entry***, then click **edit**.



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Entries that have been entered identically across 1st and 2nd entries will automatically appear in the final entry. Fields highlighted in pink do not match across 1st and 2nd entries and must be checked and correct responses entered manually.

Click **save** and **close**.

Queries

Linking tables from the Access database that holds the data to the new Access database that holds the queries:

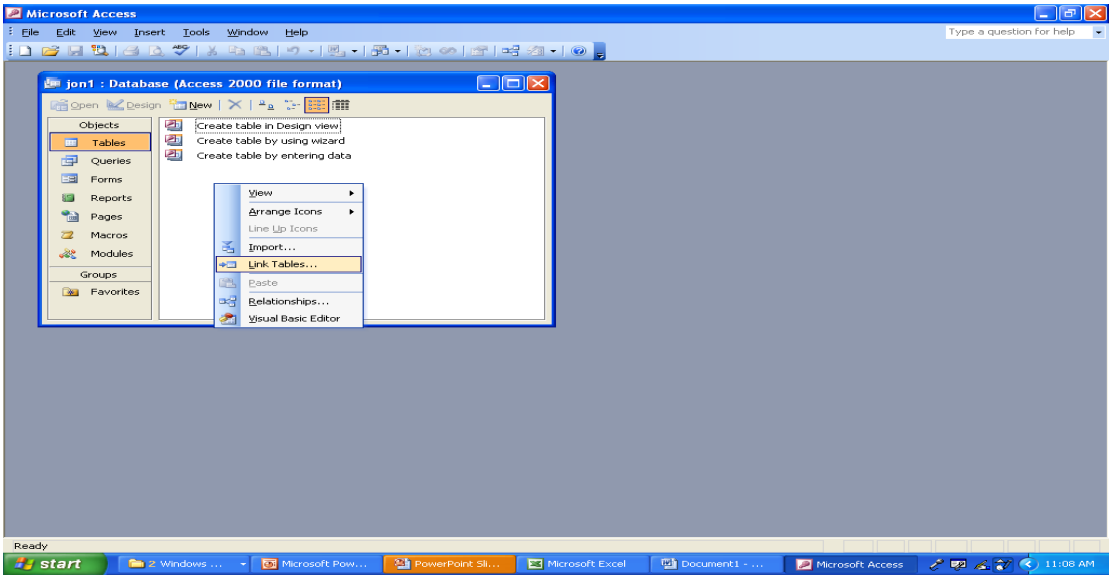
Open a new Access file

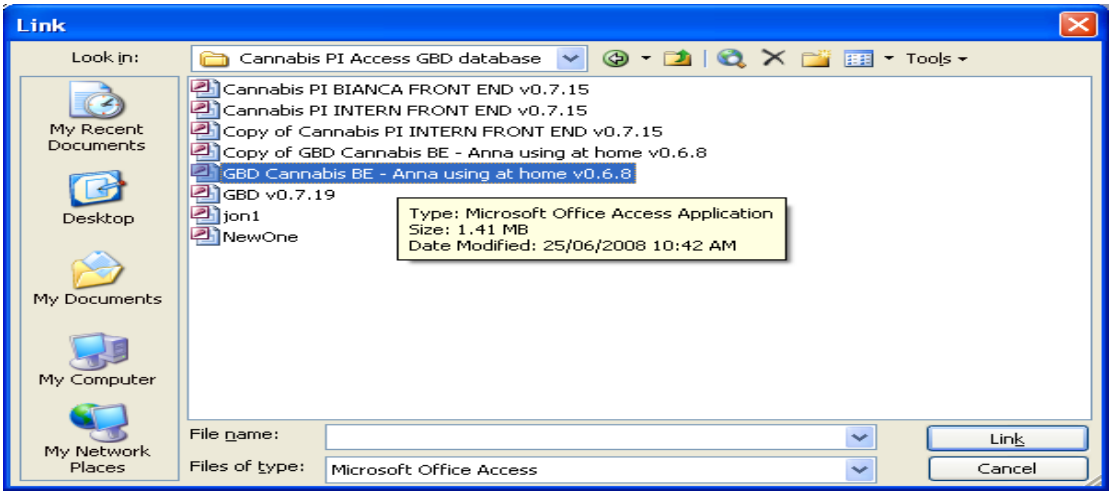
Highlight Tables in the left hand list

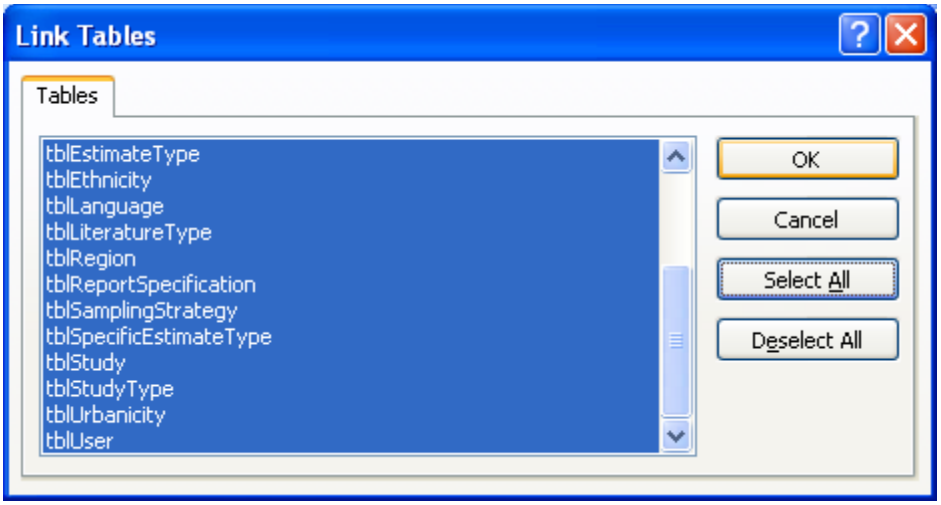
Right click and select: "Link tables"

Choose folder containing the Back End

Double click on the back end file

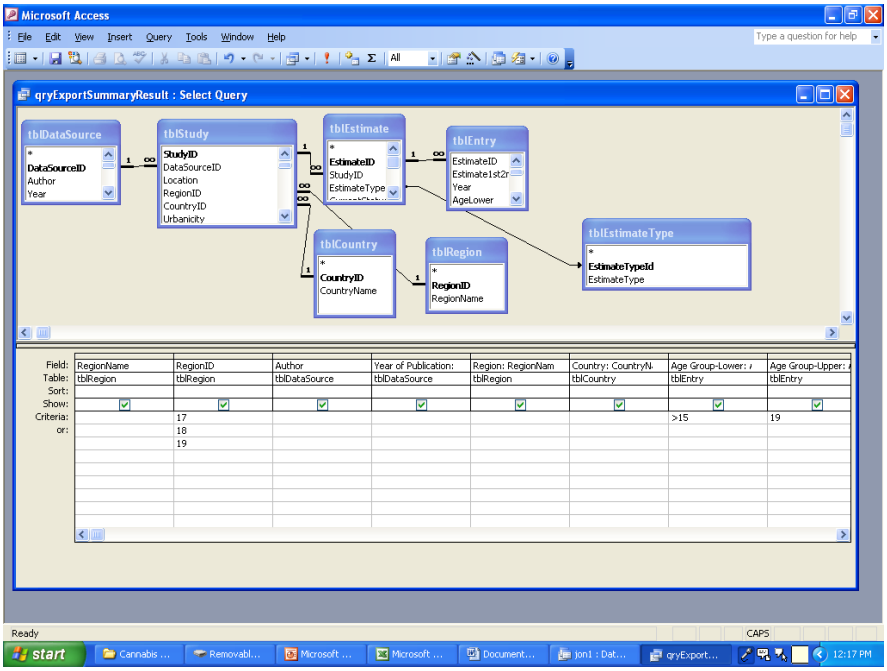






Choose "Select all"
Click "OK"

To make a query:
choose Queries from the left hand list
Select "New"
Select "Design view"
Right click over the blank area and choose "Show Table"
Choose the table that contains the data you want to run reports from
Continue doing this until you have selected all the tables containing the data you want to pull



Use the drop down box in the Table row to select the relevant Table
Use the drop down box in the Field Row to choose the specific information
Press the red exclamation mark on the toolbar to run the report

GBD Database - Data Entry Rules

Data Source (Articles)

Variable	Database Rules
*****All relevant text can (and should!) be copied and pasted directly from Endnote*****	
Author/s	First author surname, 1st initial., second author surname, 1st initial., & final author surname, 1st initial. 2nd initial. Eg. Singleton, J., Calabria, B., & Roberts, A. S. Insert editors if no authors are stated with "eds." after their names For EMCDDA reports without authors or editors, type EMCDDA – *country of report.* If there is no Author, enter the Data Source ID (which is the top field in the Data Source Detail window) and the Country. Eg. "131 Australia" When multiple entries have the same authors (eg. Monitoring the Future) enter 1st author name, volume of report (if applicable) and year of publication, followed by list a all authors (as would usually be entered).
Year	Year of Publication Year of Publication can be copied and pasted from Endnote
Title	Title of article/report
Journal	Name of Journal (if applicable) For non-journal sources enter 999
Volume	Journal Volume(Issue) [if applicable] Eg. 118(4) Journal Volume: Issue can be copied and pasted from Endnote For non-journal sources enter 999

Variable	Database Rules
Pages	Start page – end page (if applicable) Eg. 115-118 Start and end page can be copied and pasted from Endnote For non-journal sources enter 999
Organisation	For grey literature publications indicate the organisation that is
Abstract	Article abstract (if applicable)
Drug Type	Chose from drop down box NB: If cocaine powder and crack are reported separately, you will need to type this into the "Estimate Comments" box on the Estimate Details window
Language	Determines which language the article/report is written in. Select from drop down box English Other (specify other language in *Other, please specify* field)
Other, please specify	For languages other than English specify which language the article/report is written in (Other should have been selected from the *Language* drop down box)
Literature type	Indicate whether the literature type is white (peer reviewed) or grey (material that is not formally published by commercial publishers). Select from drop down box Grey White

Studies

Study Detail Section 1

Variable	Database Rules
Data Source Title	Select correct authors from drop down box
Study Type	Select study type from drop down box: Cohort study Cross-sectional study Case-control study Database review study Survey Indirect prev est (e.g., capture-recapture, multiplier)
Location	Type specific location of the study. If countrywide, type "National"
Region	Select appropriate GBD region from drop down box
Country	Select country were study took place from drop down box
Urbanicity	Select from drop down box Urban/metropolitan Rural Mixed/Other – suburban, etc. Only select an option if specifically reported in data source. Otherwise leave blank.
Ethnicity	Leave blank
QUALITY INDEX **NOTE: For mortality extraction, there is a different quality index**	

Variable	Database Rules
Case ascertainment	Ascertainment of cases nationwide or regionally? Select from drop down box Community/nationwide survey/register/database Case registers/Regional death registers/One treatment institution/hospital Not specified **NOTE:** For studies using indirect prevalence estimation (e.g., capture-recapture), choose 'Community/nationwide survey/register/database'
Measurement	Measurement instrument to determine cannabis use or dependence. Select from drop down box Interview/self-reported drug use/In treatment for drug dependence Systematic case note/database/reports review/blood and/or urine toxicology screen Chart diagnosis Not specified **NOTE:** For studies using indirect prevalence estimation (e.g., capture-recapture), choose 'Interview/self-reported drug use/In treatment for drug dependence'
Diagnosis	Indicates whether cannabis dependence was diagnosed. Select from drop down box Any diagnostic system reported for drug dependence or abuse/Dependence inferred from type of sample population Drug use/Own system/Symptoms described If not reported, leave blank and make note in quality index comments that "Diagnosis" not reported. **NOTE:** For studies using indirect prevalence estimation (e.g., capture-recapture), choose 'Any diagnostic system reported for drug dependence or abuse/Dependence inferred from type of sample population'
Estimate	Estimate presented (e.g. prevalence, incidence, mortality, relative risk, etc.) Select from drop down box Yes No
Num/Den	Was the numerator and denominator presented for **ALL** the estimates of interest? Select from drop down box Yes No

Variable	Database Rules
Num/Den Area/Epoch	Were the numerator and denominator based on identical epochs and identical catchment areas for estimate of interest? That is, was the estimate (prevalence for example) calculated based on the sample (YES) or by use of population numbers for the denominator from the same year and area (YES)? Choose NO if the denominator is from a different year or area from the sample. Select from drop down box Yes No
Completeness	Captures response rates and attrition rates. Select from drop down box High response rate/inclusion of defined sample population (>80%) Moderate response rate (60% - 79%) Exclusions Poor response rate (<60%)made If response rate is not reported, please select "Exclusions Poor response rate (<60%) made" as this option is scored as 0 and make a comment in the quality index comments box that completeness was not reported. **NOTE:** For studies using indirect prevalence estimation (e.g., capture-recapture), choose 'High response rate/inclusion of defined sample population (>80%)'
Representativeness	Determines generalisability of the sample to the population Select from drop down box Well represented/National registers/Multiple institutions across states Small area/Not representative of nation/One treatment centre/Registers of specific populations Convenient sampling/Other If not reported, leave blank and make note in quality index comments that "Representativeness" not reported. **NOTE:** For studies using indirect prevalence estimation (e.g., capture-recapture), choose 'Well represented/National registers/Multiple institutions across states'
Age/sex	Identifies whether age and/or sex specific values were reported. Select from drop down box Yes (estimates dived by age and sex) Some (eg. sex and 2 broad age ranges only) No
Quality	To capture methods that were not reported on by other variables (free text)

Variable	Database Rules
Duration FU	To obtain more information about follow-up periods and sample sizes when doing so (free text)
Total	Automatically calculates the total Quality Index Score
Quality Index Notes	Insert any other quality information that has not been captured by other variables. For example, note whether the study is one that uses indirect prevalence methods, and state which data sources were used for this.
Estimate type	No need to choose an option here.

Study Detail Section 2

Variable	Database Rules
Epoch start	Year that the study started. If the study only extends over one year enter the same year in Epoch start and Epoch end.
Epoch end	Year that the study ended. If the study only extends over one year enter the same year in Epoch start and Epoch end.
N	Total number of people in the sample. If the number of people who responded to the drug use questions is reported, and this is different to the overall N, put in the drug response N here and make a note in the comments. Enter the total N in the Comments. Otherwise enter total sample N here.
Population	Specific information about the type of population. For a representative sample enter "general population".
Sampling strategy	Select from drop down box Simple random sampling Stratified random sampling Cluster sampling Systematic sampling Other Other (Matching Other (Snowballing) Other (Convenience) Other (please specify) Census If sampling strategy is not reported, select "Other" and enter "Not reported" in the Sampling strategy Other box.
Sampling strategy Other	If *Other* is selected from *Sampling Strategy*, indicate sampling strategy used here If Sampling Strategy was not reported enter "Not reported" here
Minimum Age at Intake	The minimum age of the total sample at intake. Enter section/survey data into intake fields. If the study does not report the youngest age, enter "0" and make a comment in the *age comments* box indicating no minimum age reported. See end of manual for ages of U.S high school and college students.

Variable	Database Rules
Maximum Age at Intake	The maximum age of the total sample at intake. Enter section/survey data into intake fields. If no maximum age is reported, enter "99" and make a comment in the *age comments box* indicating no maximum age reported. See end of manual for ages of U.S high school and college students.
Age Mean at Intake	The mean age of the total sample at intake. Enter section/survey data into intake fields.
Age Median At Intake	The median age of the total sample at intake. Enter section/survey data into intake fields.
Response Rate (%)	Response rate, reported as a percent. If reported for different age groups enter highest reported, then make comment in *studies comment* box indicating all response rates reported.
Minimum Age at FU	The minimum age of the total sample at follow-up. See end of manual for ages of U.S high school and college students.
Maximum Age at FU	The maximum age of the total sample at follow-up. If no maximum age is reported, enter "99" and make a comment in the *age comments box* indicating no maximum age reported. See end of manual for ages of U.S high school and college students.
Age Mean at FU	The mean age of the total sample at follow-up.
Age Median FU	The median age of the total sample at follow-up.
Attrition Rate (%)	The attrition rate, reported as a percent.
Male N	Number of males in the sample.
Male Percent	Percent of males in the sample.
Person Yrs FU	Total person years follow up (this is mainly relevant for cohort studies) If person years of follow up are reported by age and/or sex, please record this in the Person Yrs FU Notes box
Lost To FU	What % of the sample is lost to follow up?
Age Comments	Additional comments about age.
Person Yrs FU Notes	If person years of follow up are reported by age and/or sex, please record this here.
Comments	If a peer reviewed article reports on an aspect of a larger survey, note which survey the data comes from in the comments box. Must enter text or alternatively "999" if no comments are required.
Estimate Type	Select type of estimate from drop down box Duration Incidence Mortality Prevalence Remission

Estimate Details

Variable	Database Rules

Variable	Database Rules
Entry	Click the radio button for 1st Entry for the first time the data is entered for and article, 2nd entry for the second time the data is entered for the same article and final entry when you want to compare the 1st and 2nd entries.
Estimate Type	Select estimate type from drop down box Duration Incidence Mortality Prevalence Remission
Specific Estimate Type	Select specific estimate type from drop down box Duration Incidence Cumulative incidence Past Year Incidence Mortality CMR (Crude Mortality Rate) SMR (Standardised Mortality Ratio) RR (Relative Risk) OR (Odds Ratio) HR (Hazard Ratio) CFR (Case Fatality Ratio) Other, please specify (specify in *Estimate Comments*) Prevalence Lifetime Prevalence Past Year Prevalence Past Month Prevalence Remission Abstinent Still using, not dependent Still met criteria for dependence Relapsed
Cause of Death	For mortality estimates only. If mortality, "other, please specify" put details in *Estimates Comments*
Estimate Comments	Add extra information that is not captured by other variables. If cocaine powder and crack cocaine are reported separately, type "Crack cocaine" or "Cocaine powder" here
SUMMARY	
Drug	Indicates use or dependence, select from drop down box Use Dependence Other (eg. abuse – specify in *Estimate Comments*)
Year	Year of estimate If data were collected across 2 years (eg: July 2004 until May 2005) enter "0405" (this includes mortality cohorts). If no year of estimate is stated then insert the publication year minus 2 years

Variable	Database Rules
Age Lower	Minimum age of age group for which estimate is reported. If only reporting for one age, put the same age in *Age Lower* and *Age Upper*. If estimate applies to entire sample, enter the youngest age from the age range If the study does not report the youngest age, enter "0" and make a comment in the *age comments* box indicating no minimum age reported. See end of manual for ages of U.S high school and college students.
Age Upper	Maximum age of age group for which estimate is reported. If only reporting for one age, put the same age in *Age Lower* and *Age Upper*. If estimate applies to entire sample, enter the oldest age from the age range If no maximum age is reported, enter "99" and make a comment in the *age comments box* indicating no maximum age reported. See end of manual for ages of U.S high school and college students.
FEMALE	
Estimate	Estimate reported for females (eg. past year prevalence)
CI Confidence	Type of confidence interval used, as a percent. Eg. For a 95% CI, 95 would be entered
CI Lower	Lower limit of the confidence interval
CI Upper	Upper limit of the confidence interval
Numerator	Numerator of the estimate, if reported.
Denominator	Denominator **of the estimate**, if reported.
Standard error	Standard error of the estimate.
Radix	Indicate how estimates are given, uniformly per 10* of population. e.g. per 100000 or 100
Standardised	Tick box if the estimate standardised. Leave the box blank if the estimate is not standardised.
How Standard	If the estimate is standardised, indicate how/ by what.
MALE	
Estimate	Estimate reported for males (eg. past year prevalence)
CI Confidence	Type of confidence interval used, as a percent. Eg. For a 95% CI, 95 would be entered
CI Lower	Lower limit of the confidence interval
CI Upper	Upper limit of the confidence interval
Numerator	Numerator of the estimate, if reported.
Denominator	Denominator of the estimate, if reported.
Standard error	Standard error of the estimate.
Radix	Indicate how estimates are given, uniformly per 10* of population. e.g. per 100000 or 100
Standardised	Tick box if the estimate standardised. Leave the box blank if the estimate is not standardised.
How Standard	If the estimate is standardised, indicate how/ by what.
TOTAL	

Variable	Database Rules
Estimate	Estimate reported for both males and females combined (eg. past year prevalence)
CI Confidence	Type of confidence interval used, as a percent. Eg. For a 95% CI, 95 would be entered
CI Lower	Lower limit of the confidence interval
CI Upper	Upper limit of the confidence interval
Numerator	Numerator of the estimate, if reported.
Denominator	Denominator of the estimate, if reported.
Standard error	Standard error of the estimate.
Radix	Indicate how estimates are given, uniformly per 10* of population. e.g. per 100000 or 100
Standardised	Tick box if the estimate standardised. Leave the box blank if the estimate is not standardised.
How Standard	If the estimate is standardised, indicate how/ by what.

General GBD Database Rules

Situation	Entry	Comments
Missing data/not applicable	999	All fields in the database must be completed. Enter the missing data code if field is not applicable or study does not report on a particular variable
For EMCDDA Data; These are the standardised rules for entering EMCDDA		
Location	"National" unless otherwise specified	
Urbanicity	"Mixed/other" unless otherwise specified	
Ethnicity	Left blank as no general rule is applicable	
Case Ascertainment	"Community/Nationwide survey/Register/Database"	
Measurement	"Interview/Self-reported Drug Use/In treatment for Drug Dependence	
Diagnosis	"Drug use/own system/ symptoms described"	
Completeness	Left blank unless specified	
Representativeness	"Well represented/ national registers/ multiple institutions across states"	

Ages for U.S High School and College Students

	High school students		College students
	8th grade	13-14 years	
Freshman	**9th grade**	14-15 years	18-19 years
Sophomores	**10th grade**	15-16 years	19-20 years
Juniors	**11th grade**	16-17 years	20-21 years
Seniors	**12th grade**	17-18 years	21-22 years

For further information data extraction and the Access database see also:
http://www.gbd.unsw.edu.au/gbdweb.nsf/resources/Methodology_pt3c_Drugs/$file/GBD_Methodology_pt3b_IllicitDrugs_08Oct08.pdf

APPENDIX E: SEARCH STRINGS FOR ANY EVIDENCE OF USE IN SPECIFIC COUNTRIES

Databases/Search Engine	Search Group	Search terms
GoogleScholar	Cannabis	cannabis OR marijuana OR bhang OR ganga OR hashish OR hemp or cannabis indica OR cannabis sativa or hemp plant or marihuana
	Drug use	"drug use" OR "drug abuse" OR "substance use" OR "substance abuse"
	Country	*"country name"*
WorldCat/ PubMed/ PsychINFO	Cannabis	cannabis OR marijuana OR bhang OR ganga OR hashish OR hemp or cannabis indica OR cannabis sativa or hemp plant or marihuana
	Drug use	"drug use" OR "drug abuse" OR "substance use" OR "substance abuse"
	Country	"*country name*"

APPENDIX F: GLOBAL BURDEN OF DISEASE COUNTRY AND REGION LIST

The 21 Global Burden of Disease (2005) Regions

ASIA PACIFIC, HIGH INCOME
~
Brunei
Japan
Republic of Korea
Singapore

ASIA, CENTRAL
~
Armenia
Azerbaijan
Georgia
Kazakhstan
Kyrgyzstan
Mongolia
Tajikistan
Turkmenistan
Uzbekistan

ASIA, EAST
~
China
Democratic People's Republic of Korea
Hong Kong
Taiwan

ASIA, SOUTH
~
Afghanistan
Bangladesh
Bhutan
India
Nepal
Pakistan

ASIA, SOUTHEAST
~
Cambodia
Indonesia
Lao People's Democratic Republic
Malaysia
Maldives
Mauritius
Mayotte
Myanmar
Philippines
Seychelles
Sri Lanka
Thailand
Timore Leste
Viet Nam

AUSTRALASIA
~
Australia
New Zealand

CARIBBEAN
~
Anguilla
Antigua and Barbuda
Aruba
Bahamas
Barbados
Belize
Bermuda
British Virgin Islands
Cayman Islands
Cuba
Dominica
Dominican Republic
French Guiana
Grenada
Guadaloupe
Guyana
Haiti
Jamaica
Martinique
Montserrat
Netherlands Antilles
Saint Kitts and Nevis
St. Lucia
St. Vincent
Suriname
Trinidad and Tobago
Turks and Caicos Islands

EUROPE, CENTRAL
~
Albania
Bosnia and Herzegovina
Bulgaria
Croatia

Czech Republic
Hungary
Poland
Romania
Serbia and Montenegro
Slovakia
Slovenia
The Former Yugoslav Republic of Macedonia

EUROPE, EASTERN
~
Belarus
Estonia
Latvia
Lithuania
Republic of Moldova
Russian Federation
Ukraine

EUROPE, WESTERN
~
Andorra
Austria
Belgium
Channel Islands
Cyprus
Denmark
Faeroe Islands
Finland
France
Germany
Gibraltar
Greece
Greenland
Holy See
Iceland
Ireland
Isle of Man
Israel
Italy
Liechtenstein
Luxembourg
Malta
Monaco
Netherlands
Norway
Portugal
Saint Pierre et Miquelon
San Marino
Spain
Sweden
Switzerland
United Kingdom

LATIN AMERICA, ANDEAN
~
Bolivia
Ecuador
Peru

LATIN AMERICA, CENTRAL
~
Colombia
Costa Rica
El Salvador
Guatemala
Honduras
Mexico
Nicaragua
Panama
Venezuela

LATIN AMERICA, SOUTHERN
~
Argentina
Chile
Falkland Islands (Malvinas)
Uruguay

LATIN AMERICA, TROPICAL
~
Brazil
Paraguay

NORTH AFRICA / MIDDLE EAST
~
Algeria
Bahrain
Egypt
Iran (Islamic Republic of)
Iraq
Jordan
Kuwait
Lebanon
Libyan Arab Jamahiriya
Morocco
Occupied Palestinian Territory
Oman
Qatar

Saudi Arabia
Syrian Arab Republic
Tunisia
Turkey
United Arab Emirates
Western Sahara
Yemen

NORTH AMERICA, HIGH INCOME
~
Canada
United States of America

OCEANIA
~
American Samoa
Cook Islands
Fiji
French Polynesia
Guam
Kiribati
Marshall Islands
Micronesia (Federated States of)
Nauru
New Caledonia
Niue
Northern Mariana Islands
Palau
Papua New Guinea
Pitcairn
Samoa
Solomon Islands
Tokelau
Tonga
Tuvalu
Vanuatu
Wallis and Futuna Islands

SUB-SAHARAN AFRICA, CENTRAL
~
Angola
Central African Republic
Congo
Democratic Republic of the Congo
Equatorial Guinea
Gabon

SUB-SAHARAN AFRICA, EAST
~
Burundi
Comoros
Djibouti
Eritrea
Ethiopia
Kenya
Madagascar
Malawi
Mozambique
Rwanda
Somalia
Sudan
Uganda
United Republic of Tanzania
Zambia

SUB-SAHARAN AFRICA, SOUTHERN
~
Botswana
Lesotho
Namibia
South Africa
Swaziland
Zimbabwe

NATIONAL DRUG AND ALCOHOL RESEARCH CENTRE

The National Drug and Alcohol Research Centre (NDARC) is a premier research institution in Australia and is recognised internationally as a Research Centre of Excellence. The Centre is multidisciplinary and collaborates with medicine, psychology, social science and other schools of the University of NSW, as well as with a range of other institutions and individuals in Australia and overseas.

The overall mission of NDARC is to conduct high quality research and related activities that increases the effectiveness of Australian and International treatment and other intervention responses to alcohol and other drug related harm.

In addition to the research conducted at the Centre, other NDARC activities include an Annual Symposium and a range of special conferences and educational workshops. As well as contributing to scientific journals and other publications, NDARC produces its own Research Monographs and Technical Report Series. In conjunction with the National Drug Research Institute in Perth, NDARC also produces a free quarterly newsletter, CentreLines, to increase communication between the national research centres, other researchers and workers in the alcohol and other drug field.

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