Review

Prevalence of Cannabis Use around the World: A Systematic Review and Meta-Analysis, 2000–2024

Qianning Wang[1,&]; Zhen Qin[2,&]; Xing Xing[2]; He Zhu[2,#]; Zhongwei Jia[1,2]

ABSTRACT

This study aims to perform a systematic review and meta-analysis on the global prevalence of cannabis use to inform drug prevention strategies, policy-making, and resource allocation. This study initially screened 177,843 studies published between January 1, 2000, and January 15, 2024, using peer-reviewed databases including Web of Science, PubMed, Scopus, Embase, and Cochrane Library. Ultimately, 595 studies were identified for data extraction, and 39 of these were selected as country-representative studies. Heterogeneity among the selected studies was assessed using the chi-squared test and I^2 statistic, while sensitivity analysis was conducted to evaluate the robustness of the results. The prevalence of cannabis use varied between 0.42% and 43.90% across 33 European countries, 1.40% to 38.12% across 15 North and South American countries, 0.30% to 19.10% across 16 Asian countries, and 1.30% to 48.70% across 18 Oceania and African countries. The pooled prevalence of cannabis use was 12.0% [95% confidence interval (*CI*): 10.0, 14.3] in countries where cannabis is legalized, compared to 5.4% (95% *CI*: 4.3, 6.9) in non-legalized countries. Our findings indicate that the prevalence of cannabis use has disproportionately increased in most countries with the implementation of medical or recreational cannabis legalization policies and relevant geographic proximity. Increased efforts are needed to monitor newly cannabis-legalized countries and prevent initial use.

Cannabis is the most widely used drug globally, especially among adolescents, and previous research suggests that it may act as a gateway drug (*1*). In 2021, an estimated 219 million individuals used cannabis across nearly every country and territory (*1*), a 21% increase from approximately 180.6 million in 2011 (*2*). This rise in cannabis use raises concerns about potential adverse health effects, including impaired motor coordination, cognitive impairment, cannabis use disorders, and chronic psychotic disorders such as schizophrenia (*3*–*4*). These health issues could significantly burden global health, safety, and economic development (*5*). One study indicated that the incremental inpatient costs associated with cannabis comorbidity in Florida hospitals increased by 7% to 19% (*6*).

Studies suggest that cannabis legalization policies have significantly impacted the prevalence of cannabis use worldwide (*7*–*8*). By January 2024, more than 40 countries had implemented policies affecting global cannabis and other drug use trends (*9*). For instance, in the United States, the prevalence of past-month cannabis use among adolescents increased by 4.0% from 2008 to 2019 following the legalization of recreational cannabis (*10*).

There is a lack of comprehensive reviews addressing the recent prevalence of cannabis use worldwide, particularly from the perspective of legalization. This study conducted a systematic review and meta-analysis to estimate global cannabis use prevalence following the implementation of legalization policies, with the aim of informing drug prevention, policy-making, and resource allocation.

METHODS

Search Strategies

A systematic review was conducted following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (*11*), and the protocol was registered on PROSPERO (CRD42024506616). Peer-reviewed literature databases — Web of Science, PubMed, Scopus, Embase, and the Cochrane Library — were searched using a comprehensive set of search terms developed in consultation with a specialist drug librarian (Supplementary Material, available at https://weekly.chinacdc.cn/). The review focused on studies reporting the country-level prevalence of cannabis use published between January 1, 2000, and January 15, 2024.

Screening and Quality Assessment

A library was created using Endnote (version X.8, Clarivate Analytics Philadelphia, PA, USA) to catalog studies and eliminate duplicates. Initial screening of titles and abstracts was independently conducted by two authors (QW and ZQ), followed by a full-text review of the selected studies. Studies were excluded if they met any of the specified exclusion criteria (Supplementary Material).

The risk of study bias was evaluated using the Joanna Briggs Institute (JBI) Checklist for Prevalence Studies (*12*) (Supplementary Material). Two authors (QW and ZQ) independently rated the risk scores, classifying studies into high-risk (marked by 0–3), moderate-risk (marked by 4–6), and low-risk (marked by 7–9) groups. Any discrepancies were resolved through discussion with a third author (HZ). Only studies with moderate or low risk of bias were selected for data extraction.

Data Extraction and Representative Study Selection

Data from eligible studies were extracted into a custom-built database using Microsoft Excel (version 2019, Microsoft Corporation, Redmond, WA, USA). To account for the prevalence of cannabis use reported in multiple studies using the same database and to enhance comparability among countries, we selected representative studies for each country based on predefined selection criteria (Supplementary Material). A comprehensive search initially identified 177,843 studies, of which 101,703 were removed as duplicates. An additional 75,132 were excluded based on specific exclusion criteria, and 413 were eliminated due to high-risk bias. Consequently, 595 studies underwent data extraction, and 39 were ultimately designated as representative studies for their respective countries (Figure 1).

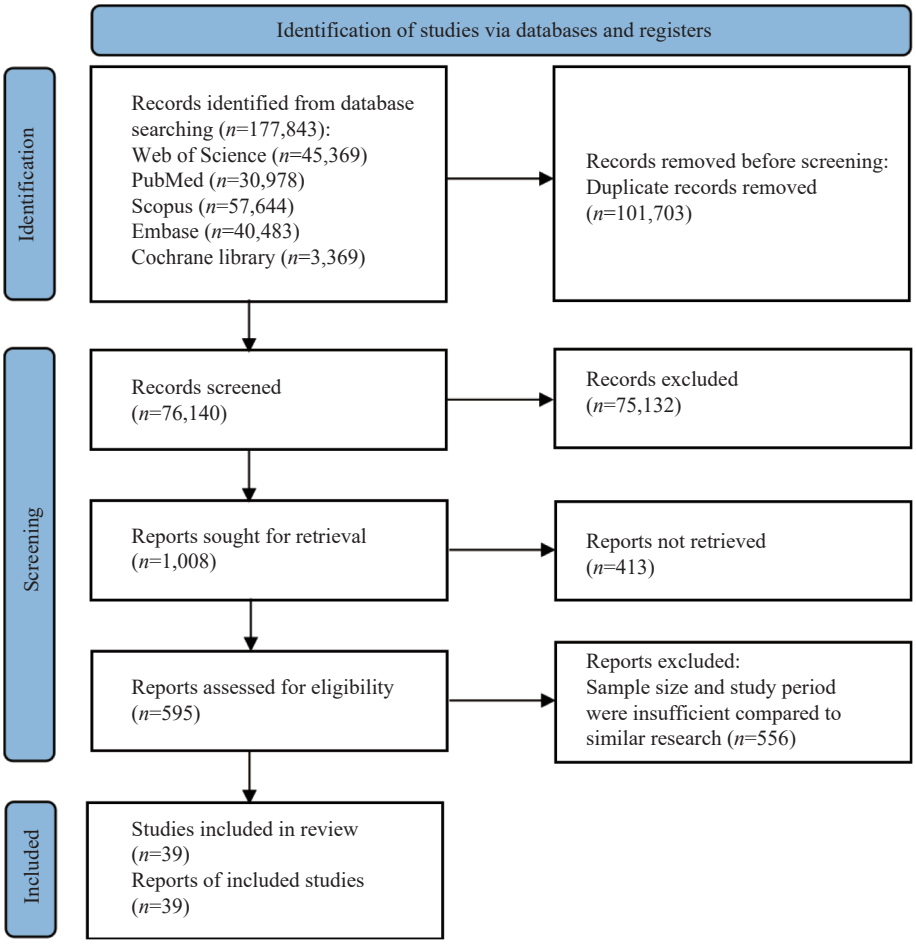

FIGURE 1. PRISMA flow diagram for the systematic review.
Abbreviation: PRISMA=Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Statistical Analysis

The chi-squared test and I^2 statistic were used to assess the heterogeneity of the selected studies (*13*). Random-effects models (REM) were employed due to $P<0.05$ or $I^2>50\%$, indicating potential heterogeneity among studies. Sensitivity analysis was conducted to evaluate the robustness of the results by systematically excluding studies with the most significant impact on the pooled outcomes. All analyses were performed using R software (version 4.3.0, R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

Prevalence of Cannabis Use in Europe

Among the country-representative studies selected, the prevalence of cannabis use varied significantly, ranging from 0.42% to 43.90% across 33 European countries. The highest prevalence was observed in the Netherlands in 2013, while the lowest was reported in Sweden in 2016.

In examining the legalization of cannabis, data on prevalence has been documented by 19 countries where cannabis is legal. Typically, developed nations are among the first to relax restrictions on cannabis supply and usage penalties. For instance, in 2010, 28.14% of the Swiss population and 25.72% of the Spanish population reported using cannabis. Conversely, 14 countries reported relatively low prevalence rates of cannabis use during periods of illegality, with figures ranging from 2.76% to 30.50%. Specifically, in 2010, the prevalence was 2.76% in Macedonia, 4.31% in Romania, and in 2019, it was 6.60% in Estonia.

Prevalence of Cannabis Use in North and South America

The prevalence of cannabis use varied from 1.40% to 38.12% across 15 countries in North and South America. In the United States, an overall increasing trend was observed following the legalization of medical and recreational cannabis, with the highest prevalence of 38.12% recorded in 2021.

As in Europe, countries where cannabis is legalized often exhibit a higher prevalence rates. Data on cannabis use are available for eight countries with legalized cannabis. Both Brazil and Uruguay have shown increasing trends, with the highest prevalence reaching 23.10% in Brazil in 2019 and 20.78% in Uruguay in 2018. Additionally, eight countries reported cannabis use prevalence during periods when it was illegal, ranging from 2.60% to 18.93%. Specifically, the prevalence in Bolivia was 2.60% in 2012, in Peru it was 2.90% in 2010, and in Suriname, it was 3.90% in 2017.

Prevalence of Cannabis Use in Oceania and Africa

The prevalence of cannabis use ranged from 1.30% to 48.70% across 18 countries in Oceania and Africa. Data from three countries where cannabis is legalized reveal varying prevalence rates. In Australia, the highest recorded prevalence was 48.70% in 2004, though this has since shown a declining trend. Similarly, New Zealand saw a peak prevalence of 19.00% in 2012, which has also decreased over time. In South Africa, the prevalence was 7.80% in 2017. In contrast, fifteen countries reported lower prevalence rates, ranging from 1.30% to 10.40%, during periods when cannabis was illegal. Specifically, in 2017, Benin had a prevalence of 1.30%, while Tanzania reported a prevalence of 2.30%.

Prevalence of Cannabis Use in Asia

The prevalence of cannabis use in 16 Asian countries ranged from 0.30% to 19.10%, which is relatively lower compared to European and American countries. Two countries specifically documented this data. In Israel, cannabis use prevalence increased from 5.43% in 2010 to 19.10% in 2017. In Lebanon, it was 1.60% in 2017. Fourteen countries reported cannabis use prevalence during periods when it was illegal, with rates ranging from 0.30% to 6.00%. In 2004, Japan had the lowest prevalence at 0.30%. The prevalence was 0.60% in Laos in 2015 and in Vietnam in 2013.

Meta-Analysis

In the meta-analysis, 33 studies reported the prevalence of cannabis use in 32 countries where cannabis is legalized, involving 17.12 million samples with 1.26 million cases. Conversely, 11 studies reported the prevalence in 51 countries where cannabis is illegal, involving 1.28 million samples with 205,630 cases. Overall, countries with legalized cannabis showed a higher pooled prevalence of use compared to those with illegal cannabis. The REM estimated the pooled prevalence of cannabis use to be 12.0% [95% confidence interval (*CI*): 10.0, 14.3] in legalized countries, compared to 5.4% (95% *CI*: 4.3, 6.9) in non-legalized countries (Figures 2 and 3). Sensitivity

Study	Event	Total	Prevalence (%)	95% *CI*	Forest plot
Europe					
Shi, Y. Y. 2015-Austria-2010	445	**4,354**	**10.2**	(9.3, 11.1)	
Shi, Y. Y. 2015-Belgium-2010	1,678	**8,904**	**18.9**	(18.1, 19.7)	
Shi, Y. Y. 2015-Croatia-2010	613	**5,405**	**11.4**	(10.5, 12.2)	
Glavak Tkalić, R. 2013-Croatia-2012	742	**4,756**	**15.6**	(14.6, 16.7)	
Shi, Y. Y. 2015-Denmark-2010	593	**3,990**	**14.9**	(13.8, 16.0)	
Shi, Y. Y. 2015-Finland-2010	382	**5,327**	**7.2**	(6.5, 7.9)	
Shi, Y. Y. 2015-France-2010	1,594	**6,592**	**24.2**	(23.2, 25.2)	
Shi, Y. Y. 2015-Germany-2010	711	**5,681**	**12.5**	(11.7, 13.4)	
Naegele, H. 2022-Germany-2017	3,880	**9,350**	**41.5**	(40.5, 42.5)	
Olderbak, S. 2024-Germany-2021	7,868	**78,678**	**10.0**	**(8.9, 11.3)**	
Shi, Y. Y. 2015-Iceland-2010	379	**5,502**	**6.9**	(6.3, 7.6)	
Arnarsson, A. 2018-Iceland-2015	54	**2,336**	**2.3**	(1.8, 3.0)	
Shi, Y. Y. 2015-Italy-2010	688	**3,797**	**18.1**	(16.9, 19.4)	
Amerio, A. 2023-Italy-2019	420	**6,003**	**7.0**	(6.4, 7.7)	
Amerio, A. 2023-Italy-2020	354	**6,003**	**5.9**	(5.3, 6.5)	
Amerio, A. 2023-Italy-2022	402	**6,003**	**6.7**	(6.1, 7.4)	
Shi, Y. Y. 2015-Luxembourg-2010	489	**2,860**	**17.1**	(15.8, 18.5)	
Shi, Y. Y. 2015-Netherlands-2010	785	**4,070**	**19.3**	(18.1, 20.5)	
Van Straaten, B. 2016-Netherlands-2013	151	**344**	**43.9**	(38.7, 49.2)	
Shi, Y. Y. 2015-Norway-2010	58	**1,313**	**4.4**	(3.4, 5.7)	
Heradstveit, O. 2021-Norway-2013	7,136	**121,767**	**5.9**	(5.7, 6.0)	
Heradstveit, O. 2021-Norway-2016	10,373	**172,877**	**6.0**	(5.9, 6.1)	
Heradstveit, O. 2021-Norway-2019	21,836	**272,268**	**8.0**	(7.9, 8.1)	
Shi, Y. Y. 2015-Portugal-2010	406	**3,710**	**10.9**	(10.0, 12.0)	
Shi, Y. Y. 2015-Slovenia-2010	765	**4,336**	**17.6**	(16.5, 18.8)	
Shi, Y. Y. 2015-Spain-2010	1572	**6,111**	**25.7**	(24.6, 26.8)	
Shi, Y. Y. 2015-Sweden-2010	57	**1,212**	**4.7**	(3.6, 6.0)	
Rabiee, R. 2023-Sweden-2016	13,893	**3,307,759**	**0.4**	(0.4, 0.4)	
Shi, Y. Y. 2015-Switzerland-2010	1,393	**4,952**	**28.1**	(26.9, 29.4)	
Kázmér, L. 2017-The Czech Republic-2010	464	**1,522**	**30.5**	(28.2, 32.9)	
Kázmér, L. 2017-The Czech Republic-2014	407	**1,760**	**23.1**	(21.2, 25.1)	
Shi, Y. Y. 2015-United Kingdom-2010	3,204	**14,128**	**22.7**	(22.0, 23.4)	
Hammond, D. 2021-United Kingdom-2017	708	**3,914**	**18.1**	(16.9, 19.3)	
Hammond, D. 2021-United Kingdom-2018	671	**3,812**	**17.6**	(16.4, 18.8)	
Hammond, D. 2021-United Kingdom-2019	600	**3,392**	**17.7**	(16.5, 19.0)	
Hindocha, C. 2021-United Kingdom-2020	909	**12,809**	**7.1**	(6.7, 7.6)	
North and South America					
Romano, E. 2023-Barbados-2011	140	**1,504**	**9.3**	(7.9, 10.9)	
Madruga, C. S. 2022-Brazil-2012	248	**3,828**	**6.5**	**(5.1, 8.1)**	
Vellozo, E. P. 2023-Brazil-2019	337	**1,460**	**23.1**	(21.0, 25.3)	
Lowry, D. E. 2020-Canada-2004	26,374	**289,823**	**9.1**	(9.0, 9.2)	
Leos-Toro, C. 2019-Canada-2005	2,472	**16,705**	**14.8**	(14.3, 15.3)	
Leos-Toro, C. 2019-Canada-2007	14,238	**58,353**	**24.4**	(24.1, 24.8)	
Leos-Toro, C. 2019-Canada-2009	12,401	**45,425**	**27.3**	(26.9, 27.7)	
Shi, Y. Y. 2015-Canada-2010	2,509	**8,405**	**29.9**	(28.9, 30.8)	
Leos-Toro, C. 2019-Canada-2011	9,509	**44,852**	**21.2**	(20.8, 21.6)	
Leos-Toro, C. 2019-Canada-2013	7,924	**41,057**	**19.3**	(18.9, 19.7)	
Leos-Toro, C. 2019-Canada-2015	6,050	**36,665**	**16.5**	(16.1, 16.9)	

Lowry, D. E. 2020-Canada-2017	42,024	**289,823**	**14.5**	(14.4, 14.6)
Nigatu, Y. T. 2023-Canada-2019	9,988	**60,171**	**16.6**	(16.3, 16.9)
Libuy, N. 2020-Chile-2011	5,938	**33,172**	**17.9**	**(17.5, 18.3)**
Libuy, N. 2020-Chile-2013	16,716	**57,641**	**29.0**	**(28.6, 29.3)**
Libuy, N. 2020-Chile-2015	18,064	**54,084**	**33.4**	**(32.6, 33.4)**
Libuy, N. 2020-Chile-2017	17,166	**55,197**	**31.1**	**(29.8, 30.6)**
Castillo-Carniglia, A. 2020-Chile-2018	1,653	**15,895**	**10.4**	(9.9, 10.9)
Wang, Q. 2023-Jamica-2017	225	**1,608**	**14.0**	**(10.9, 17.2)**
López-Méndez, M. 2021-Mexico-2016	888	**61,658**	**1.4**	(1.3, 1.5)
Chawla, D. 2018-United States-2002	46,788	**779,799**	**6.0**	(5.9, 6.1)
Chawla, D. 2018-United States-2003	48,348	**779,799**	**6.2**	(6.1, 6.3)
Chawla, D. 2018-United States-2004	46,788	**779,799**	**6.0**	(5.9, 6.1)
Chawla, D. 2018-United States-2005	45,228	**779,799**	**5.8**	(5.7, 5.9)
Chawla, D. 2018-United States-2006	46,788	**779,799**	**6.0**	(5.9, 6.1)
Chawla, D. 2018-United States-2007	44,449	**779,799**	**5.7**	(5.6, 5.8)
Chawla, D. 2018-United States-2008	46,788	**779,799**	**6.0**	(5.9, 6.1)
Chawla, D. 2018-United States-2009	49,907	**779,799**	**6.4**	(6.3, 6.5)
Chawla, D. 2018-United States-2010	53,026	**779,799**	**6.8**	(6.7, 6.9)
Chawla, D. 2018-United States-2011	52,247	**779,799**	**6.7**	(6.6, 6.8)
Chawla, D. 2018-United States-2012	56,146	**779,799**	**7.2**	(7.1, 7.3)
Chawla, D. 2018-United States-2013	56,925	**779,799**	**7.3**	(7.2, 7.4)
Chawla, D. 2018-United States-2014	63,164	**779,799**	**8.1**	(8.0, 8.2)
Chawla, D. 2018-United States-2015	60,824	**779,799**	**7.8**	(7.7, 7.9)
Gu, J. 2023-United States-2017	187,302	**491,348**	**38.1**	(38.0, 38.3)
Vidourek, R. A. 2022-United States-2018	16,548	**89,446**	**18.5**	(18.2, 18.8)
Castillo-Carniglia, A. 2020-Uruguay-2001	65	**4,616**	**1.4**	(1.1, 1.8)
Laqueur, H. 2020-Uruguay-2018	7,450	**35,854**	**20.8**	(20.4, 21.2)
Oceania and Africa				
Hayatbakhsh, M. R. 2007-Australia-2004	1,162	**2,386**	**48.7**	(46.7, 50.7)
Graham, V. E. 2018-Australia-2011	188	**429**	**43.8**	(39.2, 48.5)
Graham, V. E. 2018-Australia-2012	157	**402**	**39.1**	(34.4, 44.0)
Kaur, N. 2021-Australia-2016	15,968	**145,168**	**11.0**	(10.8, 11.2)
Ball, J. 2023-New Zealand-2012	2,167	**11,405**	**19.0**	(18.3, 19.7)
Ball, J. 2023-New Zealand-2014	1,642	**11,405**	**14.4**	(13.8, 15.1)
Ball, J. 2023-New Zealand-2016	1,699	**11,405**	**14.9**	(14.3, 15.6)
Ball, J. 2023-New Zealand-2018	1,756	**11,405**	**15.4**	(14.7, 16.1)
D'Mello, K. 2023-New Zealand-2021	1,959	**52,938**	**3.7**	(3.5, 3.9)
Ramlagan, S. 2021-South Africa-2017	3,058	**39,207**	**7.8**	(7.5, 8.1)
Asia				
Shi, Y. Y. 2015-Israel-2010	243	**4,473**	**5.4**	(4.8, 6.1)
Isralowitz, R. 2018-Israel-2017	623	**3,264**	**19.1**	(17.8, 20.5)
Romano, E. 2023-Lebanon-2017	54	**3,347**	**1.6**	(1.2, 2.1)
Random effects model		17,120,607	12.0	(10.0, 14.3)
Heterogeneity: I^2=100%, τ^2=0.925 (P<0.05)				

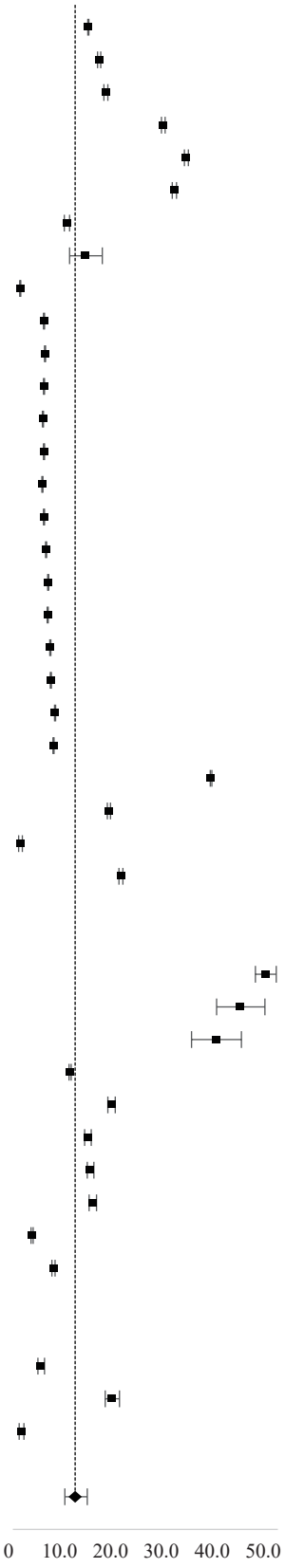

FIGURE 2. Pooled prevalence of cannabis use across legalized countries.
Note: Bold data were extracted from the literature, and the other data were calculated in this study. The dash line (12.0%) shows the pooled prevelance.

analysis revealed no significant variations, confirming the stability of the results. However, the high heterogeneity observed in the analysis and potential publication bias in some studies could be attributed to the diversity of countries and the varying periods from which data were sourced.

DISCUSSION

Our findings indicate a disproportionate global increase in cannabis use, with significant regional variations since 2000, consistent with previous studies. This rise may be attributed to increased access to cannabis, shifting cultural perceptions, and evolving legislation (*14*). Worldwide, more countries are decriminalizing cannabis, and in those with existing legalization, regulations are becoming more permissive (e.g., recreational use and possession limits) (*15*). The acceleration of economic globalization presents additional challenges to decreasing the prevalence of cannabis use.

Notably, countries with medical or recreational cannabis legalization policies have shown an increasing trend and higher prevalence of cannabis use. In Japan, where cannabis control is relatively strict, the prevalence remains low (*16*). In contrast, in the United States, cannabis use has increased following the legalization of recreational cannabis in Colorado and Washington in 2012 (*17*).

The prevalence of cannabis use demonstrated regional consistency, with neighboring countries or continents exhibiting similar levels of use. For example, in Europe, countries like the Netherlands and Spain

Study	Event	Total	Prevalence (%)	95% *CI*	Forest plot
Europe					
Shi, Y. Y. 2015-Bulgaria-2010	223	**1,677**	**13.3**	(11.8, 15.0)	
Tamson, M. 2021-Estonia-2003	601	**11,348**	**5.3**	**(4.4, 6.3)**	
Tamson, M. 2021-Estonia-2007	670	**11,348**	**5.9**	**(5.0, 7.0)**	
Shi, Y. Y. 2015-Estonia-2010	673	**4,209**	**16.0**	(14.9, 17.1)	
Tamson, M. 2021-Estonia-2011	692	**11,348**	**6.1**	**(5.2, 7.2)**	
Tamson, M. 2021-Estonia-2015	874	**11,348**	**7.7**	**(6.6, 8.9)**	
Tamson, M. 2021-Estonia-2019	749	**11,348**	**6.6**	**(5.7, 7.0)**	
Shi, Y. Y. 2015-Greece-2010	188	**4,122**	**4.6**	(4.0, 5.2)	
Shi, Y. Y. 2015-Hungary-2010	425	**4,067**	**10.4**	(9.5, 11.4)	
Shi, Y. Y. 2015-Latvia-2010	585	**3,620**	**16.2**	(15.0, 17.4)	
Shi, Y. Y. 2015-Lithuania-2010	518	**5,474**	**9.5**	(8.7, 10.3)	
Shi, Y. Y. 2015-Macedonia-2010	131	**4,739**	**2.8**	(2.3, 3.3)	
Shi, Y. Y. 2015-Malta-2010	70	**956**	**7.3**	(5.8, 9.1)	
Shi, Y. Y. 2015-Poland-2010	816	**5,760**	**14.2**	(13.3, 15.1)	
Shi, Y. Y. 2015-Romania-2010	150	**3,491**	**4.3**	(3.7, 5.0)	
Shi, Y. Y. 2015-Russia-2010	539	**6,425**	**8.4**	(7.7, 9.1)	
Shi, Y. Y. 2015-Slovakia-2010	363	**2,883**	**12.6**	(11.4, 13.8)	
Kázmér, L. 2017-The Czech Republic-2002	506	**1,660**	**30.5**	(28.3, 32.8)	
Kázmér, L. 2017-The Czech Republic-2006	413	**1,665**	**24.8**	(22.8, 26.9)	
Shi, Y. Y. 2015-Ukraine-2010	493	**5,137**	**9.6**	(8.8, 10.4)	
North and South America					
Romano, E. 2023-Bahamas-2013	80	**1,308**	**6.1**	(4.9, 7.5)	
Vancampfort, D. 2019-Bolivia-2012	73	**2,804**	**2.6**	(2.1, 3.3)	
Libuy, N. 2020-Chile-2003	7,914	**58,192**	**13.6**	**(13.4, 13.9)**	
Libuy, N. 2020-Chile-2005	8,476	**59,689**	**14.2**	**(14.0, 14.5)**	
Libuy, N. 2020-Chile-2007	7,790	**50,914**	**15.3**	**(15.0, 15.6)**	
Libuy, N. 2020-Chile-2009	7,082	**47,528**	**14.9**	**(14.6, 15.2)**	
Montero-Zamora, P. 2023-Costa Rica-2018	160,905	**850,000**	**18.9**	(18.8, 19.0)	
Shi, Y. Y. 2015-Greenland-2010	164	**870**	**18.9**	(16.4, 21.6)	
Vancampfort, D. 2019-Peru-2010	68	**2,359**	**2.9**	(2.3, 3.7)	
Wang, Q. 2023-Suriname-2017	74	**1,903**	**3.9**	**(1.8, 6.1)**	
Wang, Q. 2023-The Dominican Republic-2017	64	**1,359**	**4.7**	**(2.2, 7.3)**	

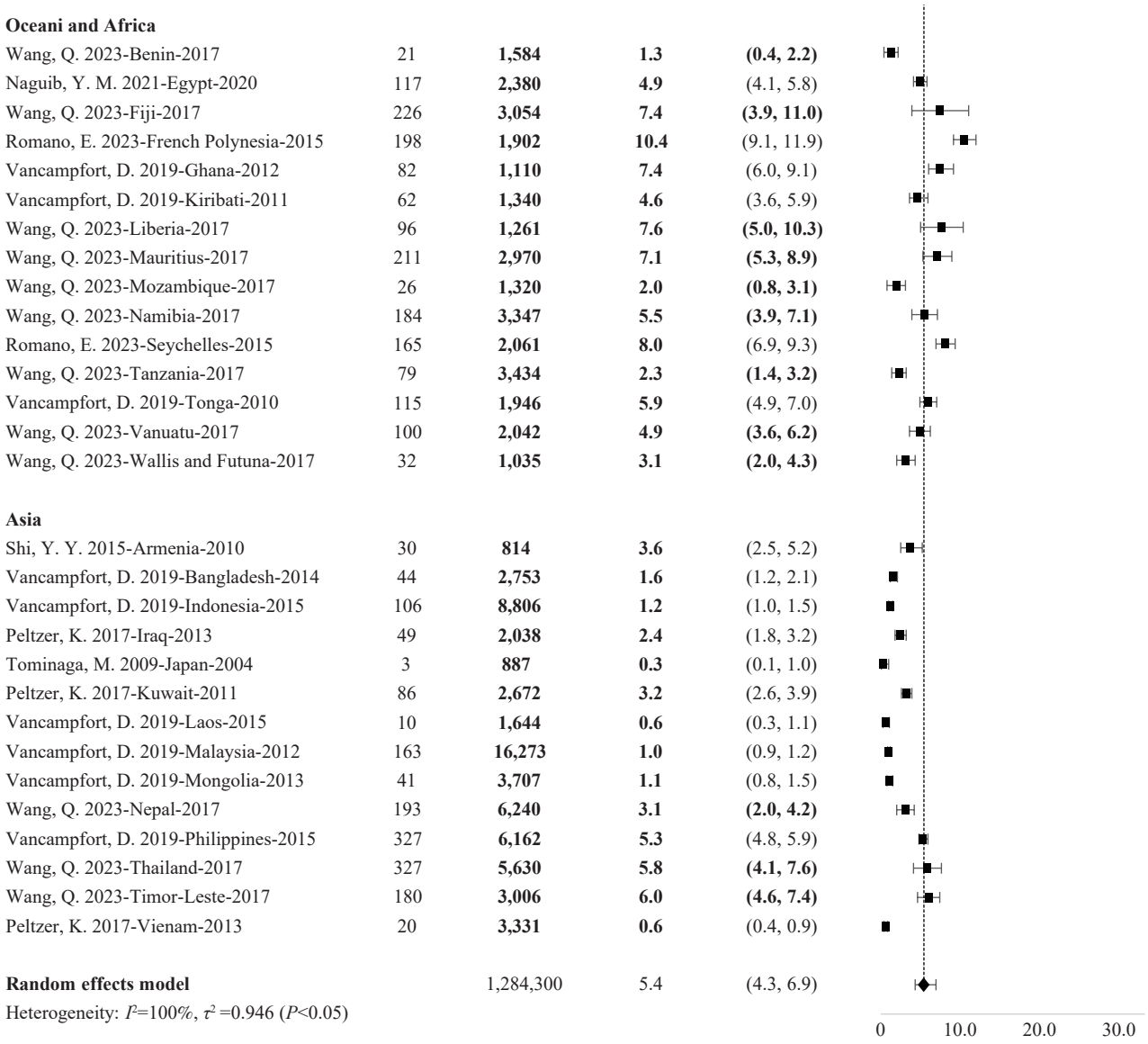

FIGURE 3. Pooled prevalence of cannabis use across non-legalized countries.
Note: Bold data were extracted from the literature, and the other data were calculated in this study. The dash line (5.4%) shows the pooled prevelance.

showed relatively high cannabis use prevalence (*18*). This trend also extended to nearby countries, such as France and Germany, where cannabis use was similarly common (*19*).

The study is subject to some limitations. First, the study utilizes peer-reviewed literature databases, which include many studies with non-continuous data. Second, it is restricted to studies published in English, potentially excluding valuable research in other languages. Third, publication bias regarding cannabis use was not accounted for due to variations across countries. Lastly, the analysis did not examine detailed regulations of cannabis legalization; future studies should investigate the effects of various cannabis legalization measures.

Our findings indicated that the prevalence of cannabis use has disproportionately increased in many countries following the implementation of medical or recreational cannabis legalization policies, particularly in regions geographically close to these areas. As a gateway drug, this trend may lead to an increase in both cannabis use and overall drug use. Therefore, enhanced monitoring of newly cannabis-legalized countries and efforts to prevent initial use are necessary.

Conflicts of interest: No conflicts of interest.

Funding: Supported by the National Natural Science Foundation of China [72174004, 91546203].

doi: 10.46234/ccdcw2024.116

[#] Corresponding author: He Zhu, he.zhu@pku.edu.cn.

[1] National Institute of Health Data Science, Center for Drug Abuse Prevention and Control, Peking University, Beijing, China; [2] School of Public Health, Peking University, Beijing, China.
[&] Joint first authors.

Submitted: May 09, 2024; Accepted: June 17, 2024

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SUPPLEMENTARY MATERIAL

PEER-REVIEWED LITERATURE SEARCH

The search strategies were as follows: results included Search 1 and Search 2 (combined using 'AND'), with publications dated between January 1, 2000, and January 15, 2024.

Searches were conducted on January 15, 2024.

Search Strategy on Web of Science

Search 1: Cannabis Use

TS= (marijuana OR marihuana OR cannabis OR cannabinoid)

Search 2: Prevalence

TS= (prevalen* OR epidemi* OR consum* OR use* OR "use disorder")

Search Strategy on PubMed

Search 1: Cannabis Use

(marijuana[Title/Abstract]) OR (marihuana[Title/Abstract]) OR (cannabis[Title/Abstract]) OR (cannabinoid[Title/Abstract]) OR (marijuana use[MeSH Terms]) OR (cannabis[MeSH Terms])

Search 2: Prevalence

(prevalen*[Title/Abstract]) OR (epidemi*[Title/Abstract]) OR (consum*[Title/Abstract]) OR (use*[Title/Abstract]) OR ("use disorder"[Title/Abstract]) OR (prevalence[MeSH Terms]) OR (epidemics[MeSH Terms]) OR (epidemiology[MeSH Terms])

Search Strategy on Scopus

Search 1: Cannabis Use

TITLE-ABS-KEY(marijuana) OR TITLE-ABS-KEY(marihuana) OR TITLE-ABS-KEY(cannabis) OR TITLE-ABS-KEY(cannabinoid)

Search 2: Prevalence

TITLE-ABS-KEY(prevalen*) OR TITLE-ABS-KEY(epidemi*) OR TITLE-ABS-KEY(consum*) OR TITLE-ABS-KEY(use*) OR TITLE-ABS-KEY("use disorder")

Search Strategy on Embase

Search 1: Cannabis Use

marijuana:ti,ab,kw OR marihuana:ti,ab,kw OR cannabis:ti,ab,kw OR cannabinoid:ti,ab,kw

Search 2: Prevalence

prevalent:ti,ab,kw OR prevalence:ti,ab,kw OR prevalency:ti,ab,kw OR prevalently:ti,ab,kw OR epidemic:ti,ab,kw OR epidemics:ti,ab,kw OR epidemiology:ti,ab,kw OR epidemiological:ti,ab,kw OR consume:ti,ab,kw OR consumer:ti,ab,kw OR consumption:ti,ab,kw OR use:ti,ab,kw OR user:ti,ab,kw OR usage:ti,ab,kw OR "use disorder":ti,ab,kw

Search Strategy on Cochrane Library

Search 1: Cannabis Use

(marijuana):ti,ab,kw OR (marihuana):ti,ab,kw OR (cannabis):ti,ab,kw OR (cannabinoid):ti,ab,kw

Search 2: Prevalence

(prevalent):ti,ab,kw OR (prevalence):ti,ab,kw OR (prevalency):ti,ab,kw OR (prevalently):ti,ab,kw OR (epidemic):ti,ab,kw OR (epidemics):ti,ab,kw OR (epidemiology):ti,ab,kw OR (epidemiological):ti,ab,kw OR (consume):ti,ab,kw OR (consumer):ti,ab,kw OR (consumption):ti,ab,kw OR (use):ti,ab,kw OR (user):ti,ab,kw OR (usage):ti,ab,kw OR (use disorder):ti,ab,kw

EXCLUSION CRITERIA

Studies were excluded if they met any of the following criteria: lack of data on the prevalence of cannabis use; non-population-based studies (e.g., chemical or animal experiments); non-original studies (e.g., reviews or editorials); non-English studies; and studies without full-text access.

JOANNA BRIGGS INSTITUTE (JBI) CHECKLIST FOR PREVALENCE STUDIES

The checklists include the following criteria: an appropriate sampling frame for addressing the target population; adequately sampled study participants; sufficient sample size; detailed descriptions of study subjects and settings; comprehensive data analysis covering the identified sample; valid methods for condition identification; standardized and reliable condition measurement for all participants; appropriate statistical analysis; and adequate response rate management, including appropriate handling of low response rates.

SELECTION CRITERIA

The representative study selection criteria were the following: prioritizing geographic coverage, prioritizing studies with participants who had used cannabis in the past month, and prioritizing studies with longer durations and larger sample sizes when multiple studies reported the prevalence of cannabis use within a country.