Public attitudes and lifetime home cannabis cultivation – a survey after legalization in Germany

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ABSTRACT

In 2024, Germany became the most populous European country to legalize home cannabis cultivation. This study provides the first empirical evidence on both public support for and engagement in home cultivation in this new regulatory context. Using survey data from a representative online-panel ($n = 1500$), we conducted hierarchical regression analyses to examine the factors associated with attitudinal outcomes (support for legalization) and behavioral outcomes (self-reported cultivation in the past or present). Results show that sociodemographic associations with support and cultivation are largely explained by cannabis experience. Among these factors, age and consumption emerged as the most consistent correlates across models. Expectations regarding the consequences of legalization were strongly associated with support but showed little relation to actual cultivation behavior. People who have cultivated expressed substantially higher support and more favorable expectations than those who have not, although participants overall tended to evaluate legalization positively. The only consistently negative expectation shared across groups was that legalization may increase cannabis use in society. Overall, support for legalization appears to be influenced by a broad set of expectations about societal consequences, whereas cultivation behavior is more closely tied to individual experience and personal motivations. While the study is situated in the German context, its insights are relevant beyond national borders: as the largest EU member state to legalize home cultivation, Germany's experience may provide valuable lessons for other jurisdictions considering similar reforms.

Introduction

Cannabis regulations are undergoing significant change worldwide, with scholars even speculating that the 21st century may become "the era of cannabis legalization" (Kilmer & Pérez-Dávila, 2023). In the European Union, Malta became the first country to legalize home cultivation in 2021 (Authority on the Responsible Use of Cannabis Act, 2021 (Malta), 2021), followed by Luxembourg in 2023 (Police Grand-Ducale, 2023), while the Czech Republic has also announced plans to allow for home cultivation (EUDA, 2025). In Germany, the *Cannabis Act* (*Cannabisgesetz*; Bundesregierung, 2024) has allowed adults to cultivate up to three cannabis plants privately at home since April 2024. Thus, while Germany is not the first country to introduce such a policy, it is by far the largest EU member state by population to do so. Scholars therefore argue that Germany's reform may act as a catalyst for further policy change across Europe (Manthey et al., 2023a), making it particularly relevant to study its early impacts. Besides regulating home cultivation, the legalization of cannabis (*Cannabisgesetz*; Bundesregierung, 2024) permits

adults to possess up to 25 g of dried cannabis for personal use, as well as collective cultivation through cannabis social clubs —non-profit associations that produce and distribute cannabis among registered members, a model that first emerged in Spain in the 1990s (Pardal et al., 2020). The sale of non-medical cannabis nevertheless remains prohibited. A central policy rationale for legalization in Germany was the reduction of the illegal market (Federal Ministry of Health, 2025). Empirical modelling shows that while legalization can diminish the profitability of illicit suppliers, it may simultaneously contribute to increased cannabis consumption (Auriol et al., 2023).

Scientific evidence on the drivers of public support or opposition to the legalization of home cultivation is overall sparse. While some evidence exists from outside Germany, most studies do not distinguish home cultivation from the broader issue of cannabis legalization (e.g., Palali & Van Ours, 2016; Wilkins et al., 2021). A key common finding is that people who use cannabis are more likely to support legalization than those who do not (Chiu et al., 2021; Cruz et al., 2016; Palali & Van Ours, 2016; Wilkins et al., 2021). Other correlates of support focus on

assumed consequences of legalization such as health effects (Cohn et al., 2016; Wilkins et al., 2021) or economic benefits (McGinty et al., 2017), others focus on political ideology (Cruz et al., 2016; Ellis et al., 2019). However, consistent findings across studies are difficult to identify. For instance, some report significant associations with socio-demographic factors such as age (Ellis et al., 2019; Chiu et al., 2021), while others do not (Wilkins et al., 2021). Moreover, it is unclear to what extent the correlates – most of which are beliefs about the consequences of legalizing consumption - in general apply to the more specific issue of legalizing home cultivation.

While the studies above provide insights into general attitudes toward legalization, they offer little evidence on how such attitudes translate into actual cultivation behavior. In particular, the factors associated with the decision to grow cannabis at home remain underexplored. Most empirical work on cannabis growing has focused on commercially oriented and/or large-scale production (Decorte, 2010). Yet, social supply originating from small-scale domestic grower-suppliers rather than criminal organizations is a common phenomenon (Søgaard et al., 2024). Decorte (2010) was among the first to study small-scale growers, finding that most cultivators in Belgium were young, male, unmarried, and relatively well educated. Motivations for growing included financial benefits, curiosity, and the pleasure of cultivation. Similarly, Potter et al. (2015), using data from 11 countries, reported that small-scale growers were typically not socially or criminally deviant. They too found a strong male predominance and youthfulness among growers. In regions where cannabis cultivation was legalized some changes in the demographics of cultivators were sometimes observed. For instance, in Uruguay an increase of women growers was detected (Aguiar & Musto, 2022), and in Australia legal growers were typically older than in contexts where cannabis cultivation was illegal (Zhou et al., 2025). However, this contrasts with Canada, where the demographics of home cultivators remained largely unchanged after legalization in 2018 (Cristiano, 2022). In Germany, evidence presented by Werse (2015) suggests that cultivators were predominantly male (90 %) and have a median age of 26 years. Regarding the motivations for home growing, Werse (2015) found that the top three ones were avoidance of adulteration, the pleasure of cultivation, and the provision of cannabis for private use, similar to cross-national evidence provided by Potter et al. (2015). Selling or providing cannabis to others played only a minor role in Germany (Werse, 2015). Taken together, the cultivation literature highlights a parallel set of considerations, including cost savings, product quality, and independence from illegal sources. These may likewise be interpreted as perceived consequences of home cultivation, echoing the kinds of beliefs that have been shown to shape support for legalization.

Objective of the study

Existing research on cannabis cultivation has mainly examined those people who cultivate cannabis at home – and not those who do not – making it difficult to understand which socio-demographic or other factors distinguish cultivators from non-cultivators. Also, public support for home cultivation remains underexplored. Since the long-term success and stability of cannabis policy reforms depend not only on cultivation practices but also on broader societal acceptance, understanding the drivers of support and opposition is crucial. In the present study, we focus on a set of belief items that capture respondents' perceived consequences of home cultivation. This study therefore examines (1) which socio-demographic factors and perceived consequences of home cultivation are associated with support for its legalization, and (2) whether these same factors are also associated with the decision to cultivate cannabis at home.

To the best of our knowledge, this is the first empirical study to examine both public support for home cultivation and lifetime cultivation (i.e. past or current cultivation) behavior in Germany following the 2024 legalization. Given that little is yet known about how this new

policy will affect both attitudes and behaviors, it is particularly important for policymakers and other stakeholders to monitor these developments closely in order to understand the broader implications of legalization. Our data collection took place in December 2024, approximately eight months after the new policy was introduced. In addition, our study contributes to the field by addressing a notable gap: regression-based analyses in this area remain rare, particularly those that simultaneously investigate attitudinal outcomes (support for legalization) and behavioral outcomes (having ever engaged in cultivation). By applying the same set of independent variables across both outcomes, we are able to systematically compare the factors associated with expressed support versus those associated with lifetime cultivation behavior.

Methods

Data collection

Data were collected online in Germany in December 2024 via the external panel provider moweb research GmbH. The panel provider incentivized participation through a points system that could be redeemed for instance via monetary compensation, gift vouchers, or charitable donations. The panel provider used a non-probability sampling approach but applied quotas for age, gender, and household income to approximate the demographic distribution of the German population (see Table 1). As a result, the sample is broadly comparable to the population on these characteristics, but the findings cannot be assumed to be fully generalizable to the German population. Participation was fully informed, anonymous, and in accordance with the World Medical Association's Code of Ethics (Declaration of Helsinki). Nonparticipation or discontinuation of the survey had no consequences other than not receiving the points for redemption. This study was part of a larger survey primarily focused on behavior related to horticultural products. Participants were not informed in advance that the questionnaire also included items on cannabis. This minimizes the likelihood of self-selection based on interest in, or attitudes toward, cannabis.

Statistical analyses approach

As an initial step of our analyses, we systematically compared people who have ever cultivated and those who have not using inferential statistics, drawing on chi-square tests, U-Whitney Mann Test and independent-samples *t*-tests where appropriate (see Tables 1 and 2).

To address our first research question on which socio-demographic factors and perceived consequences of home cultivation are associated with support for its legalization, we ran hierarchical linear regressions with the dependent variable "support for the legalization of home cultivation of cannabis". Independent variables were entered stepwise in three blocks:

- Block I: Sociodemographic variables (model 1)
- Block II: Cannabis experience (model 2)
- Block III: Consequences of home cannabis cultivation (model 3)

We used SPSS version 29 software. The variance inflation factors were < 3 in all regression models, indicating that multicollinearity should not be an issue (O'Brien, 2007; Hair et al., 2019). The Breusch-Pagan Test indicated that we may assume heteroscedasticity in model 1 and 2. Here, robust standard errors were estimated. We set the alpha value at $p < 0.05$.

To address our second research question whether the same factors are also associated with the decision to cultivate cannabis at home we again employed a stepwise regression approach. Two adjustments were made compared to the analyses on support for legalization. First, since the dependent variable (home cultivation) is binary, we estimated binary logistic regressions. Second, for cannabis experience, only the

Table 1
Summary statistics of the sample ($n = 1500$).

Characteristic	Specification	Whole Sample ($n = 1500$, in %)	Comparative statistics for Germany (%)	People who have cultivated ($n = 159$; in %)	Non-Cultivators ($n = 1341$, in %)	Comparison p-value[2]; Size effect
Age[1]	Mean (SD)	50.21 (18.84)		40.61 (16.88)	51.35 (18.75)	$p < 0.001$; −0.58 *
	18–29 years	16.8	13.2	29.6	15.3	
	30–44 years	25.2	22.7	40.3	23.4	
	45–59 years	20.8	25.3	11.9	21.8	
	≥ 60 years	37.2	38.4	18.2	39.4	
Gender[1]	Female	48.9	50.9	41.5	49.9	$p = 0.047$; ** 0.051
	Male	51.0	48.6	58.1	50.1	
Net household income[1]	€0–€1499	18.1	12.1	17.6	18.2	$p = 0.278$; −0.050***
	€1500 - <€3000	38.7	31.1	37.1	38.9	
	€3000 - <€5000	31.7	34.3	27.7	32.1	
	>€5000	11.5	22.6	17.6	10.7	
Education[1]	University degree	28.5	23.1	30.2	28.3	$p = 0.061$; 0.013**
	No university degree	71.5	76.9	69.8	71.7	
Region	City (>100,000 inhabitants)	40.5		47.2	39.7	$\beta = 0.171$; 0.049**
	Town (10,000 – 100,000 inhabitants	36.1		33.3	36.4	
	Rural area (≤ 10,000 inhabitants)	23.5		19.5	23.9	

[1] compared to people ≥ 18 years living in Germany in 2023 (GESIS Leibniz-Institut, 2025).
[2] *two-tailed *t*-test; ** Chi-Square Test with contingency coefficient; *** U-Whitney Mann Test with rank-biserial correlation.

Table 2
Mean comparison of people who have cultivated and non-cultivators.

Characteristic	Speci-fication	Whole Sample ($n = 1500$)	People who have cultivated ($n = 159$)	Non-Cultivators ($n = 1341$)	Comparison p-value; Size effect (95 % CI)*
Support of home cultivation	Mean (SD)	4.05 (2.01)	5.90 (1.18)	3.83 (1.97)	<0.001; −1.09 (−1.26/−0.92)
Expectations: Legalization of home cultivations…					
reduces illegal activities in Germany.	Mean (SD)	3.24 (1.28)	3.78 (1.11)	3.18 (1.28)	<0.001 −0.47 (−0.64/−0.31)
reduces illegal activities outside Germany.	Mean (SD)	3.15 (1.29)	3.65(1.18)	3.09 (1.29)	<0.001 −0.44 (−0.60/−0.27)
leads to cost savings for people who use cannabis.	Mean (SD)	3.37 (1.15)	3.78 (1.05)	3.32 (1.15)	<0.001 −0.41 (−0.57/−0.24)
leads to increased consumption in society as a whole.	Mean (SD)	3.44 (1.17	3.10 (1.15)	3.48 (1.16)	<0.001 0.33 (0.16/0.49)
leads to better control over the quality of the product.	Mean (SD)	3.21 (1.27)	3.89 (1.06)	3.13 (1.27)	<0.001 −0.61 (−0.77/−0.44)
leads to greater independence from other sources of supply.	Mean (SD)	3.47 (1.16)	3.94 (1.06)	3.41 (1.16)	<0.001 −0.46 (−0.62/−0.29)
makes cultivation more sustainable.	Mean (SD)	3.16 (1.20)	3.74 (1.06)	3.10 (1.20)	<0.001 −0.54 (−0.71/−0.37)
is an interesting hobby.	Mean (SD)	2.69 (1.35)	3.84 (1.06)	2.55 (1.31)	<0.001 −0.99 (−1.16/−0.83)

* Cohen's d.

consumption dummy (see below) was included. The assumption of linearity of the logit was tested using the Box–Tidwell procedure (Box & Tidwell, 1962), with Bonferroni correction applied to all terms (Tabachnick & Fidell, 2018). All predictors met the assumption of linearity. Correlations between independent variables were below $r = 0.70$, indicating that multicollinearity was not a concern in the analyses.

Measurements of dependent variables

Support for Home Cultivation: we measured this variable via the question "I support the private cultivation of cannabis (i.e., growing it at home)", where participants had to answer on a 5 point Likert-typed scale ranging from "1 = disagree to 5 = agree". Beforehand we added an explanatory sentence regarding the recent legalization in order for our participants to be informed on the status quo for the legalization of home cultivation. See Appendix I for details.

Lifetime Home Cultivation: we measured this by asking "have you ever grown cannabis at home yourself?", where participants could answer with either "yes" or "no". Accordingly, we distinguish between those who have never cultivated and those who have cultivated in the past or are currently doing so.

Measurements of independent variables

Socio-economic variables: We included a set of socio-demographic variables in our models. Gender was coded with *male* as the reference category. Age was included as a continuous variable measured in years. Household income was assessed in four categories: less than €1500 (reference), €1500–<€2999, €3000–<€5000, and €5000 or more per month. Region of residence distinguished between larger cities (>100,000 inhabitants; reference), smaller cities (10,000–100,000 inhabitants), and rural areas (≤10,000 inhabitants). Education was coded as a binary indicator, contrasting respondents without a university degree (reference) and those with a university degree.

Cannabis experience: a binary dummy variable distinguished those who have never consumed cannabis (base) from those who have. In the regressions explaining *support for legal home cultivation* (Table 2), we additionally included the dummy variable of *lifetime home cultivation* (see above) as an independent variable.

Consequences of home cannabis cultivation: Building on the literature that has examined factors associated with support for legalization, we adapted these insights to the context of cultivation. For example, rather than asking about direct health consequences which relate to

consumption we asked about the potential increase in overall consumption, which can be understood as a precursor to such health effects. Consequently, we asked participants to indicate their agreement with seven statements on the potential consequences of home cannabis cultivation. Responses were recorded on a five-point Likert-type scale (1 = disagree to 5 = agree). The items were randomized in their order and addressed both societal- and individual-level outcomes: reducing illegal activities in Germany; reducing illegal activities outside Germany (e.g., cross-border trafficking); lowering costs for people who use cannabis; increasing cannabis consumption in society as a whole; improving control over product quality; increasing independence from other sources of supply; and making cultivation more sustainable. All items were phrased neutrally i.e., and in a way that could be answered by both people who have cultivated and those who have not, allowing their inclusion in both regression models. One additional item assessed whether respondents considered home cultivation to be an *interesting hobby*. While this item differs slightly in focus from the other perceived consequences, it was captured, as the pleasure of cultivation often names as a central motivator for cultivation in studies (e.g., Decoret, 2010; Potter et al., 2015; Werse, 2015). The verbatim translation of the questions can be seen in Appendix I.

Regarding the handling of missing data, our survey required responses to all items, except for the cannabis consumption questions, which included a "prefer not to answer" option. Participants selecting this option (*n* = 11) were excluded from analyses in which consumption served as an independent variable (Tables 3 and 4, Model 2 and 3). Gender was coded as a binary variable, resulting in the exclusion of one participant in the regressions presented in Tables 3 and 4. No additional missing data were present in the dataset.

Results and discussion

Socio demographic overview

Table 1 presents the socio-demographic characteristics of our participants and compares people who have ever cultivated with those who have never cultivated. The composition of our overall sample aligns rather well with national statistics for Germany. Approximately 10 % of our sample has experience with cultivation of cannabis at home. This is similar to numbers from the US, where a survey suggests that around 7 % to legality cultivated cannabis in 2020 (Wadsworth et al., 2022). When comparing both groups, only few statistically significant differences emerge. Our results indicate that people who have ever cultivated in Germany are significantly younger than those who have not, with almost 70 % under the age of 45. This age pattern is consistent with earlier national and international studies that likewise identified younger cohorts as more likely to engage in cultivation (Decorte, 2010; Potter et al., 2015; Werse, 2015). The finding that individuals around 40 years of age show the highest rates of home cultivation aligns with results reported by Athey and Newhart (2024). A significant gender difference also emerges in our data, although it is far less pronounced than in previous studies, all from a decade ago, which reported ratios of approximately 9:1 in favor of men (Lenton et al., 2015; Potter et al., 2015; Werse, 2015). In our sample, 41.5 % of people who have cultivated where indeed women. One possible explanation for this finding could be a relative increase in women cultivators following legalization—a trend also observed in Uruguay (Aguiar & Musto, 2022). However, this question was not included in our survey.

Table 2 presents descriptive statistics and inferential mean comparisons (*t*-tests) between people who have ever cultivated and those who have not. Consistent with expectations, individuals who have cultivated are much more supportive of the legalization of home cultivation. They also report more favorable evaluations regarding nearly all expected consequences of legalization compared to non-cultivators. Effect sizes indicate that differences are not only statistically significant but also substantive: the largest differences are observed for support of

legalization ($d = -1.09$) and for perceiving cultivation as an interesting hobby ($d = -0.99$), both of which represent large effects. Moderate effects are evident for expectations related to quality control, sustainability, and independence, while smaller but still meaningful effects are found for cost savings and reductions in illegal activity. At the same time, it is noteworthy that, with the exception of the "hobby" item, mean scores for both groups were above the neutral midpoint of 3. This indicates a general tendency among participants to view the consequences of legalization positively, regardless of their cultivation status. The only negative exception is the expectation that legalization will lead to increased consumption in society as a whole, which was also rated above 3. This reflects that, on average, participants tend to share this more negative anticipation as well. This concern may not be unfounded, as recent systematic reviews by Belackova et al. (2025) and Manthey et al. (2023b) found that greater legal availability of cannabis was indeed associated with higher levels of use.

Regression results and discussion

Table 3 presents the hierarchical linear regression analysis of associations with support for the legalization of home cultivation of cannabis. In Model 1, gender and age were significantly associated with support: younger, male, and urban participants showed higher levels of support, while women and older respondents reported lower values. Indeed Felson et al. (2019) noted that men have been more supportive of legalization than women for decades. This first model, however, accounted for only a small proportion of variance (Adj. $R^2 = 0.054$). When cannabis experience was included in Model 2, the associations of gender and region were no longer significant, while age remained negatively associated. Cannabis consumption and home cultivation showed strong positive associations with support, and the overall explanatory power increased notably ($\Delta R^2 = 0.192$; Adj. $R^2 = 0.246$). This finding is consistent with earlier studies showing that people who consume cannabis are more supportive of legalization than non-consumers (Chiu et al., 2021; Cruz et al., 2016; Palali & Van Ours, 2016; Wilkins et al., 2021). In Model 3, expectations regarding the consequences of legalization were added, further improving model fit ($\Delta R^2 = 0.391$; Adj. $R^2 = 0.638$). Several expectations were positively associated with support, including the views that legalization reduces illegal activities in Germany, ensures better quality control, promotes sustainability, and constitutes an interesting hobby. Regarding the reduction of illegal activities, recent statistics from Germany indicate that cannabis-related crime rates have already declined substantially in 2024 (Bundesministerium des Innern und Heimat, 2024). This, however, may reflect a shift in police priorities, with fewer resources devoted to detecting or reporting cannabis-related offences following the policy change. However, a review examining the effects of legalization on organized crime in Canada, where similar reforms were implemented in 2018, concludes that evidence on this issue remains limited and inconclusive (Bouchard et al., 2024). The expectation that legalization would increase overall consumption in society was negatively associated with support. Considering cultivation as an interesting hobby showed the strongest positive association. At this stage, age, cannabis consumption, and home cultivation remained associated with support, though with reduced effect sizes.

Table 4 presents the hierarchical logistic regression analysis of factors associated with home cultivation. In Model 1, women had lower odds of having cultivated compared to men, and higher age was also associated with lower odds. However, this model explained only a small share of variance (Nagelkerke $R^2 = 0.077$). When cannabis experience was added in Model 2, the explanatory power increased substantially (ΔNagelkerke $R^2 \approx 0.292$; Nagelkerke $R^2 = 0.369$). Cannabis consumption showed a very strong positive association with cultivation, while age remained negatively associated. This finding aligns with prior evidence indicating that younger individuals are more likely to engage in cultivation (Decorte, 2010; Potter et al., 2015; Werse, 2015). In

Table 3
Hierarchical regression with the dependent variable "support for home cultivation" ($n = 1499$).

Dependent variable: Support for home cultivation	Model 1*				Model 2*				Model 3			
	Beta	p-value	95 %	CI	Beta	p-value	95 %	CI	Beta	p-value	95 %	CI
Independent variables:												
Block I: Sociodemographic controls												
Gender (base = male)	−0.273	0.007	−0.472	−0.075	−0.056	0.544	−0.235	0.124	−0.056	0.377	−0.181	0.069
Age	−0.023	<0.001	−0.028	−0.017	−0.012	<0.001	−0.017	−0.007	−0.004	0.015	−0.008	−0.001
Household income (base = <€1500)												
€1500 - <€3000	0.030	0.841	−0.263	0.323	0.108	0.413	−0.151	0.366	0.153	0.090	−0.024	0.331
€3000 - <€5000	−0.117	0.451	−0.422	0.188	−0.020	0.886	−0.295	0.255	0.149	0.119	−0.038	0.335
>€5000	−0.411	0.056	−0.833	0.011	−0.414	0.026	−0.780	−0.049	0.005	0.970	−0.245	0.255
Region (base = City >100,000 inhabitants)												
Town (10,000 – 100,000 inhabitants)	−0.275	0.017	−0.501	−0.049	−0.129	0.219	−0.334	0.077	−0.044	0.549	−0.186	0.099
Rural area (≤ 10,000 inhabitants)	−0.389	0.004	−0.653	−0.124	−0.181	0.135	−0.418	0.056	−0.110	0.187	−0.274	0.053
Education (base = no university degree)	−0.063	0.610	−0.303	0.178	0.032	0.775	−0.185	0.248	0.017	0.819	−0.130	0.164
Block II: Cannabis experience												
Consumption (base = no)					1.844	<0.001	1.619	2.069	0.564	<0.001	0.384	0.745
Home cultivation (base = no)					0.739	<0.001	0.466	1.013	0.437	<0.001	0.207	0.666
Block III: Expectations: Legalization of home cultivations…												
reduces illegal activities in Germany.									0.228	<0.001	0.148	0.308
reduces illegal activities outside Germany.									0.057	0.144	−0.020	0.134
leads to cost savings for people who use cannabis.									0.045	0.230	−0.028	0.117
leads to increased consumption in society as a whole.									−0.305	<0.001	−0.361	−0.250
leads to better control over the quality of the product.									0.234	<0.001	0.159	0.309
leads to greater independence from other sources of supply.									0.063	0.084	−0.008	0.134
makes cultivation more sustainable.									0.176	<0.001	0.097	0.254
is an interesting hobby.									0.456	<0.001	0.395	0.516
Constant	5.876	<0.001	5.379	6.374	3.547	<0.001	2.977	4.117	0.896	<0.001	0.384	1.409
F Statistic	F(8; 1490) = 11.742				F(10; 1477) = 49.587				F(18; 1469) = 146.639			
Prob > F	<0.001				<0.001				<0.001			
Adjusted R²	0.054				0.246				0.638			
R²	0.059				0.251				0.642			
Delta R²					0.192				0.391			

*Robust standard errors were estimated.

contrast, the gender association was no longer significant once cannabis experience was accounted for. When expectations about the consequences of legalization were added in Model 3, the model fit improved only slightly (ΔNagelkerke $R^2 \approx 0.024$; Nagelkerke $R^2 = 0.393$). Among these expectations, only the belief that cultivation is an interesting hobby was positively associated with having cultivated at home. This finding supports earlier qualitative and survey evidence that enjoyment and curiosity are central motivations for growing cannabis (Decorte, 2010; Potter et al., 2015; Werse, 2015). Other expectations, such as reducing illegal activity, lowering costs, improving quality, sustainability, or independence, were not significantly associated with home cultivation. At this stage, cannabis consumption continued to show a strong positive association, while age remained negatively associated.[1]

When comparing the results from Tables 3 and 4 we see that both similarities and differences in the factors associated with support for legalization versus having cultivated cannabis at home emerge. In both models, age was consistently negatively associated, and cannabis consumption showed the strongest positive association. However,

expectations played a different role in the regressions: while several beliefs (e.g., reducing illegal activities, improving quality control, sustainability) were linked to support for legalization (Table 2), only the perception of cultivation as an interesting hobby was associated with having cultivated at home (Table 3). Sociodemographic factors such as gender and region initially showed associations in both models but lost significance once cannabis experience was considered. This suggests that the link between sociodemographic factors and support/cultivation may be partly mediated by cannabis consumption.

Limitations

There are several limitations to our study approach that should be acknowledged. First, our analyses are based on cross-sectional data, which precludes us from drawing conclusions about causal relationships; consequently, we can only speak of associations. Second, although our data collection was anonymous, both support for legalization and cultivation behavior were assessed through self-report, which may be subject to recall bias or social desirability, particularly given the sensitive nature of the topic. Third, home cultivation remains a relatively rare behavior, which limits statistical power and effect of this model's ability to correctly classify people who have cultivated, as indicated by the low specificity. Fourth, to ensure comparability, several variables were included in both the support and cultivation models, which may blur some conceptual boundaries. However, it also strengthens the robustness of our findings by allowing direct contrasts between attitudinal and behavioral outcomes. Fifth, this study relies on a non-probability online panel that employed demographic quotas to approximate the German

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[1] The classification accuracy of the final model was 89.7%. However, this high percentage was largely driven by the model's strong sensitivity (98.2%), reflecting its accuracy in classifying non-cultivators. Specificity was low (18.4%), indicating limited accuracy in correctly identifying individuals who had cultivated cannabis. This imbalance reflects the low prevalence of home cultivation in the sample, meaning that while the model distinguishes well between those who do and do not cultivate overall, it has limited predictive value for the small group of people who have cultivated.

Table 4

Hierarchical regression with the dependent variable "lifetime home cultivation" ($n = 1499$).

Dependent variable: Lifetime home cultivation	Model 1				Model 2				Model 3			
	Beta	p-value	95 %	CI	Beta	p-value	95 %	CI	Beta	p-value	95 %	CI
Independent variables:												
Block I: Sociodemographic controls												
Gender (base = male)	−0.351	0.044	0.500	0.991	0.009	0.966	0.684	1.487	0.073	0.718	0.724	1.599
Age	−0.033	<0.001	0.958	0.977	−0.018	0.002	0.970	0.993	−0.017	0.007	0.972	0.995
Household income (base = <€1500)												
€1500 - <€3000	−0.166	0.508	0.519	1.384	−0.003	0.991	0.575	1.727	0.113	0.695	0.637	1.966
€3000 - <€5000	−0.338	0.206	0.422	1.204	−0.188	0.532	0.459	1.495	−0.045	0.885	0.521	1.754
>€5000	0.185	0.562	0.645	2.244	0.293	0.422	0.656	2.736	0.492	0.190	0.784	3.412
Region (base = City >100,000 inhabitants)												
Town (10,000 – 100,000 inhabitants)	−0.169	0.387	0.576	1.239	0.072	0.747	0.696	1.658	0.103	0.648	0.712	1.726
Rural area (≤ 10,000 inhabitants)	−0.162	0.492	0.536	1.350	0.298	0.269	0.794	2.284	0.279	0.311	0.770	2.267
Education (base = no university degree)	−0.126	0.538	0.590	1.318	0.116	0.620	0.710	1.779	0.068	0.776	0.670	1.711
Block II: Cannabis experience												
Consumption (base = no)					3.062	<0.001	13.569	33.657	2.658	<0.001	8.690	23.442
Block III: Expectations: Legalization of home cultivations…												
reduces illegal activities in Germany.									−0.134	0.301	0.678	1.127
reduces illegal activities outside Germany.									−0.027	0.822	0.773	1.227
leads to cost savings for people who use cannabis.									0.007	0.951	0.795	1.276
leads to increased consumption in society as a whole.									−0.077	0.371	0.782	1.096
leads to better control over the quality of the product.									0.041	0.728	0.827	1.313
leads to greater independence from other sources of supply.									0.076	0.521	0.855	1.362
makes cultivation more sustainable.									−0.063	0.622	0.732	1.205
is an interesting hobby.									0.428	<0.001	1.241	1.897
Constant	−0.187	0.579			−2.927	0.000			−3.755	0.000		
Omnibus Statistics	$x^2(8) = 57.705$				$x^2(9) = 297.953$				$x^2(17) = 319.460$			
p-value	<0.001				<0.001				<0.001			
Nagelkerkes R^2	0.077				0.369				0.393			
Delta Nagelkerkes R^2					0.292				0.024			

population; while this improves comparability on key characteristics, the findings should not be assumed to be fully generalizable to the overall German population. Finally, given that the survey took place roughly eight months after implementation, early behavioral uptake and increased familiarity with home cultivation may already have shaped both attitudes and self-reported cultivation.

Implications

Our results have several implications for different stakeholders. For policymakers, the findings suggest that expectations about the consequences of legalization are associated with support for legalization rather than having cultivate at home. This indicates that communication of the consequences of legalization is more likely to shape attitudes than behavior. Indeed, prior research shows that political communication can significantly shape public attitudes toward policy reforms, with studies demonstrating that partisan cues and message framing influence support for complex and politicized issues such as climate policy (Linde, 2017) or drug policy (McGinty et al., 2017). While our results indicate that cultivation behavior is closely linked to cannabis use, consistent with research showing that cultivators mostly begin as consumers, this does not preclude increases in home growing over time, particularly if legalization leads to broader uptake of cannabis use and expanded social supply networks. Policy monitoring should therefore pay particular attention to younger individuals, as our results align with prior evidence that this group represents the main demographic of people who have cultivated at home. For public health stakeholders, prevention and education efforts should continue to focus on younger populations and on consumption patterns more broadly. The fact that some respondents perceive cultivation as a hobby highlights the need to provide information on safe practices, such as the appropriate handling of pesticides and cultivation equipment. For researchers, future studies should

examine how cultivation behavior develops over time and whether consumption patterns change as legalization of cultivation becomes more established. Comparative studies in other national contexts would also help assess the generalizability of these findings.

Conclusion

This study provides the first empirical evidence on both public support for and engagement in home cannabis cultivation in Germany following the 2024 legalization. While research on cannabis legalization is relatively common, most studies focus on consumption or legalization in general; in contrast, our study specifically addresses home cultivation. As Germany is the most populated country in Europe to introduce home cultivation, it will be important to observe these developments closely, since the outcomes are also highly relevant for other jurisdictions that may consider similar legalization measures. By analyzing support and lifetime cultivation within the same framework, we find evidence that sociodemographic associations are largely explained by cannabis experience, with age and consumption emerging as the most consistent factors. Expectations regarding the consequences of legalization play an important role in shaping support, but are less relevant for having cultivated at home. Overall, participants tended to evaluate the consequences of legalization positively, with people who have cultivated often expressing more favorable views than those who have not. At the same time, the expectation that legalization may increase cannabis use in society highlights a concern that persists alongside these generally positive evaluations. Our findings underscore the importance of distinguishing between attitudes and behaviors in cannabis policy research: support for legalization is influenced by a broad set of societal expectations, whereas cultivation behavior is more closely tied to personal experience and motivations.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

AI-assisted tools (ChatGPT, OpenAI) were used to improve the clarity and readability of the manuscript text. All analyses, interpretations, and conclusions are the sole responsibility of the authors.

CRediT authorship contribution statement

Mira Lehberger: Writing – review & editing, Writing – original draft, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Anne-Katrin Kleih:** Writing – review & editing, Investigation. **Kai Sparke:** Writing – review & editing, Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix I. Survey Introduction and Question Wording

Introductory text: Since this year, adults in Germany are permitted to grow and possess limited quantities of cannabis. With regard to cultivation, this means that individuals may legally grow up to three cannabis plants. Below, we ask a few questions about your attitudes and your behavior related to this topic. Please be assured that all responses are anonymous and that no conclusions can be drawn about your identity.

Type of variable (and use)	Name in the Tables	Questionnaire question and scale (translated from German)
Dependent variable (Table 3)	Support for home cultivation	I support the private cultivation of cannabis (i.e., cultivation at home). Scale: 1 = disagree to 5 = agree
Dependent variable (Table 4) Independent variable (Table 3, Model 2)	Lifetime home cultivation	Have you ever grown cannabis at home yourself? Scale: no; yes
Independent variable (Model 2 and 3)	Consumption	Do you consume cannabis? Scale: yes; I used to, but not anymore; no; I prefer not to answer (note: re-code for analyses as a dummy variable)
Independent variable (Model 3)	Reduces illegal activities in Germany	Private cannabis cultivation in Germany reduces illegal activities within Germany (e.g., domestic cannabis trafficking). Scale: 1 = disagree to 5 = agree
Independent variable (Model 3)	Reduces illegal activities outside Germany.	Private cannabis cultivation in Germany reduces illegal activities outside Germany (e.g., in cannabis-producing countries). Scale: 1 = disagree to 5 = agree
Independent variable (Model 3)	Leads to cost savings for people who use cannabis.	Private cannabis cultivation in Germany leads to cost savings for consumers. Scale: 1 = disagree to 5 = agree
Independent variable (Model 3)	Leads to increased consumption in society as a whole.	Private cannabis cultivation in Germany results in increased consumption at the societal level. Scale: 1 = disagree to 5 = agree
Independent variable (Model 3)	Leads to better control over the quality of the product.	Private cannabis cultivation in Germany leads to better control over product quality. Scale: 1 = disagree to 5 = agree
Independent variable (Model 3)	Leads to greater independence from other sources of supply.	Private cannabis cultivation in Germany provides greater independence from other sources of supply. Scale: 1 = disagree to 5 = agree
Independent variable (Model 3)	Makes cultivation more sustainable.	Private cannabis cultivation in Germany allows cultivation to be carried out more sustainably, e.g., by avoiding unfair working conditions or environmental harm. Scale: 1 = disagree to 5 = agree
Independent variable (Model 3)	Is an interesting hobby.	Private cannabis cultivation in Germany is an interesting hobby. Scale: 1 = disagree to 5 = agree

References

Aguiar, S., & Musto, C. (2022). The regulation backyard: Home growing cannabis in Uruguay. *Contemporary Drug Problems, 49*(4), 478–490. https://doi.org/10.1177/00914509221100925

Athey, S., & Newhart, M. (2024). Cultivating choice: Determinants of home cannabis growing among legal users in the United States. *Sociological Inquiry*. https://doi.org/10.1111/soin.12636

Auriol, E., Mesnard, A., & Perrault, T. (2023). Weeding out the dealers? The economics of cannabis legalization. *Journal of Economic Behavior & Organization, 216*, 62–101. https://doi.org/10.1016/j.jebo.2023.09.027

Authority on the Responsible Use of Cannabis Act, 2021 (Malta). (2021). Government Gazette of Malta No. 20 753. https://legislation.mt/eli/act/2021/66/eng (accessed 12/17/2025).

Belackova, V., Petruzelka, B., Cihak, J., Michailidu, J., & Mravcik, V. (2025). Getting "the whole picture": A review of international research on the outcomes of regulated cannabis supply. *International Journal of Drug Policy, 142*, Article 104796. https://doi.org/10.1016/j.drugpo.2025.104796

Bouchard, M., Zakimi, N., & Gomis, B. (2024). Cannabis legalization and its effects on organized crime: Lessons and research recommendations from Canada. *Sociological Inquiry*. https://doi.org/10.1111/soin.12619

Box, G. E. P., & Tidwell, P. W. (1962). Transformation of the independent variables. *Technometrics, 4*(4), 531–550. https://doi.org/10.1080/00401706.1962.10490038

Bundesministerium des Innern und Heimat. (2024): Polizeiliche Kriminalstatistik 2024. https://www.bmi.bund.de/SharedDocs/downloads/DE/publikationen/themen/sicherheit/BMI25028_pks-2024.pdf?_blob=publicationFile&v=8.

Bundesregierung (2024). *Gesetzentwurf der Bundesregierung: Entwurf eines gesetzes zum kontrollierten umgang mit Cannabis und zur änderung weiterer vorschriften (Cannabisgesetz – CanG)*. https://www.bundesgesundheitsministerium.de/fileadmin/Dateien/3_Downloads/C/Cannabis/Gesetzentwurf_Cannabis_Kabinett.pdf.

Chiu, V., Chan, G., Hall, W., Hides, L., Lim, C., & Leung, J. (2021). Personal correlates of support for medical and recreational cannabis legalization in Australia. *Frontiers in Psychiatry, 12*. https://doi.org/10.3389/fpsyt.2021.55166

Cohn, A. M., Johnson, A. L., Rose, S. W., Rath, J. M., & Villanti, A. C. (2016). Support for Marijuana legalization and predictors of intentions to use marijuana more often in response to legalization among U.S. Young adults. *Substance Use & Misuse, 52*(2), 203–213. https://doi.org/10.1080/10826084.2016.1223688

Cristiano, N., Pacheco, K., Wadsworth, E., Schell, C., Ramakrishnan, N., Faiazza, E., Beauchamp, E., & Wood, S. (2022). An analysis of cannabis home cultivation and associated risks in Canada, before and after legalization. *PubMed, 33*(9), 21–31. https://doi.org/10.25318/82-003-x202200900003-eng

Cruz, J. M., Queirolo, R., & Boidi, M. F. (2016). Determinants of public support for Marijuana legalization in Uruguay, the United States, and El Salvador. *Journal of Drug Issues, 46*(4), 308–325. https://doi.org/10.1177/0022042616649005

Decorte, T. (2010). Small scale domestic cannabis cultivation: An anonymous web survey among 659 cannabis cultivators in Belgium. *Contemporary Drug Problems, 37*(2), 341–370. https://doi.org/10.1177/009145091003700208

Ellis, J. D., Resko, S. M., Szechy, K., Smith, R., & Early, T. J. (2019). Characteristics associated with attitudes toward marijuana legalization in Michigan. *Journal of Psychoactive Drugs, 51*(4), 335–342. https://doi.org/10.1080/02791072.2019.1610199

EUDA _ European Union Drug Agency. (2025). Cannabis – the current situation in Europe. In *European drug report, 2025*. https://www.euda.europa.eu/sites/default/files/pdf/32295_en.pdf?497780.

Federal Ministry of Health. (2025). Frequently asked questions on the Cannabis Act. https://www.bundesgesundheitsministerium.de/en/themen/cannabis/faq-cannabis-act.html.

Felson, J., Adamczyk, A., & Thomas, C. (2019). How and why have attitudes about cannabis legalization changed so much? *Social Science Research, 78*, 12–27. https://doi.org/10.1016/j.ssresearch.2018.12.011

GESIS Leibniz-Institut für Sozialwissenschaften. (2025). Allgemeine bevölkerungsumfrage der Sozialwissenschaften ALLBUScompact 2023 *(ZA8831; Version 1.3.0) [Data set]. GESIS, Köln.* https://doi.org/10.4232/1.14545

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis.* Cengage Learning, 8th ed.

Kilmer, B., & Pérez-Dávila, S. (2023). Nine insights from 10 years of legal cannabis for nonmedical purposes. *Clinical Therapeutics, 45*(6), 496–505. https://doi.org/10.1016/j.clinthera.2023.03.005

Lenton, S., Frank, V. A., Barratt, M. J., Dahl, H. V., & Potter, G. R. (2015). Attitudes of cannabis growers to regulation of cannabis cultivation under a non-prohibition cannabis model. *International Journal of Drug Policy, 26*(3), 257–266. https://doi.org/10.1016/j.drugpo.2014.08.002

Linde, S. (2017). Political communication and public support for climate mitigation policies: A country-comparative perspective. *Climate Policy, 18*(5), 543–555. https://doi.org/10.1080/14693062.2017.1327840

Manthey, J., Jacobsen, B., Hayer, T., Kalke, J., López-Pelayo, H., Pons-Cabrera, M. T., … Rosenkranz, M. (2023a). The impact of legal cannabis availability on cannabis use and health outcomes: A systematic review. *International Journal of Drug Policy, 116*, Article 104039. https://doi.org/10.1016/j.drugpo.2023.104039

Manthey, J., Rehm, J., & Verthein, U. (2023b). Germany's cannabis act: A catalyst for European drug policy reform? *The Lancet Regional Health - Europe, 42*, Article 100929. https://doi.org/10.1016/j.lanepe.2024.100929

McGinty, E. E., Niederdeppe, J., Heley, K., & Barry, C. L. (2017). Public perceptions of arguments supporting and opposing recreational marijuana legalization. *Preventive Medicine, 99*, 80–86. https://doi.org/10.1016/j.ypmed.2017.01.024

O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity, 41*(5), 673–690. https://doi.org/10.1007/s11135-006-9018-6

Palali, A., & Van Ours, J. C. (2016). Cannabis use and support for cannabis legalization. *Empirical Economics, 53*(4), 1747–1770. https://doi.org/10.1007/s00181-016-1172-7

Pardal, M., Decorte, T., Bone, M., Parés, Ò., & Johansson, J. (2020). Mapping cannabis social clubs in Europe. *European Journal of Criminology, 19*(5), 1016–1039. https://doi.org/10.1177/1477370820941392

Police Grand-Ducale. (2023). *New regulations for the use and cultivation of cannabis.* Government of Luxembourg. Retrieved from https://police.public.lu/en/actualites/2023/07/semaine-30/dispositions-cannabis-en.html.

Potter, G. R., Barratt, M. J., Malm, A., Bouchard, M., Blok, T., Christensen, A., … Wouters, M. (2015). Global patterns of domestic cannabis cultivation: Sample characteristics and patterns of growing across eleven countries. *International Journal of Drug Policy, 26*(3), 226–237. https://doi.org/10.1016/j.drugpo.2014.12.007

Søgaard, T. F., Brummer, J. E., Wilkins, C., Sznitman, S. R., Sevigny, E. L., Frank, V. A., Potter, G., Hakkarainen, P., Barratt, M. J., Werse, B., Grigg, J., Fortin, D., Bear, D., Lenton, S., Jauffret-Roustide, M., & Kirtadze, I. (2024). Global patterns in small-scale cannabis growers' distribution practices: Exploring the grower-distributor nexus. *International Journal of Drug Policy.* , Article 104463. https://doi.org/10.1016/j.drugpo.2024.104463

Tabachnick, B. G., & Fidell, L. S. (2018). *Using multivariate statistics* (7th ed.). Pearson Education.

Wadsworth, E., Schauer, G. L., & Hammond, D. (2022). Home cannabis cultivation in the United States and differences by state-level policy, 2019-2020. *The American Journal of Drug and Alcohol Abuse, 48*(6), 701–711. https://doi.org/10.1080/00952990.2022.2132507

Werse, B. (2015). Legal issues for German-speaking cannabis growers. Results from an online survey. *International Journal of Drug Policy, 28*, 113–119. https://doi.org/10.1016/j.drugpo.2015.10.007

Wilkins, C., Tremewan, J., Rychert, M., Atkinson, Q., Fischer, K., & Forsyth, G. A. L. (2021). Predictors of voter support for the legalization of recreational cannabis use and supply via a national referendum. *International Journal of Drug Policy, 99*, Article 103442. https://doi.org/10.1016/j.drugpo.2021.103442

Zhou, C., Lavender, I., Gordon, R., McCartney, D., Kevin, R. C., Bedoya-Pérez, M. A., & McGregor, I. S. (2025). An analysis of the cultivation, consumption and composition of home-grown cannabis following decriminalisation in the Australian Capital Territory. *Scientific Reports, 15*(1). https://doi.org/10.1038/s41598-024-84897-w