Small-scale cannabis cultivation, use, and supply in eighteen countries: methods, motives, and experiences

Abstract

Domestic cannabis cultivation has become widespread around the world, including in countries that have historically depended on importation to meet internal demand for cannabis. Enabled by technological and horticultural developments, small-scale cannabis growing has become an established component of domestic cannabis markets. Small-scale growers operate alongside—but distinct from—drug markets dominated by serious and organized criminal outfits.

This paper seeks to better understand the methods, motives, and experiences of those involved in small-scale cannabis cultivation. An anonymous online survey was completed by predominantly small-scale cannabis growers in 18 countries (Australia, Austria, Belgium, Canada, Denmark, France, Finland, Georgia, Germany, Isreal, Italy, the Netherlands, Portugal, Spain, the United Kingdom, the United States, Uruguay and New Zealand). The survey asked active cannabis growers about their use of cannabis and other drugs; cannabis growing experience; methods and scale of growing operations; reasons for growing cannabis; participation in cannabis and other drug markets; contacts with the criminal justice system in relation to cannabis growing; involvement in other (non-drug related) criminal activity; and demographic characteristics.

Our findings suggest that the small-scale cannabis growers who responded to our survey are an atypical kind of drug market actor, representing a democratization of cannabis markets. They come from a wide range of demographic backgrounds and, cannabis-related activities aside,

tend not to be involved in problematic drug use, profit-driven drug supply, or other serious criminal activity.

Keywords

Cannabis cultivation, domestic production, cannabis markets, online survey

Introduction

Few illegal drugs expose the contradictions of contemporary drug policy as clearly as cannabis. It is simultaneously the world's most widely used controlled substance and the drug that most strains the logic of prohibition. Although cannabis is used by 228 million people annually, or about 4.4% of the global adult population (UNODC, 2024), it is associated with comparatively modest harms relative to many other psychoactive substances (Bonomo, et al., 2019; Nutt et al., 2010). Moreover, much of the harm linked to cannabis stems less from the drug itself than from the systems designed to suppress it—criminalization, market illegality, and enforcement practices that exacerbate rather than reduce risks (Potter & Wells, 2021; Rogeberg, 2018; Room et al. 2010; Wheeldon and Heidt, 2023). This tension—between the drug's ubiquity, its relatively limited harms, and the punitive regimes that continue to govern it—has helped catalyze an unprecedented global shift. Countries are reclassifying cannabis and its derivatives, expanding medical access, and experimenting with decriminalization and even full market regulation (Decorte, Lenton and Wilkins, 2020; Fortin et al., 2022). Yet one of the most consequential and underexamined effects of this changing landscape is the quiet but transformative rise of small-scale domestic cannabis cultivation.

Cannabis is distinctive among prevalent illegal drugs because it is easy to produce. No complex processing or extraction is required; a single plant can yield a substantial quantity of consumable product. The plant grows on every continent except Antarctica and adapts to a range of agronomic and climatic conditions (Clarke and Merlin, 2016). It also thrives indoors, where cultivation conditions can be tightly controlled to optimize yield and potency. Over recent

decades, the expansion of online information, seed availability, and cultivation equipment has accelerated the process of import substitution, with domestic production emerging to supplement—and in many countries largely supplant—reliance on international trafficking (Decorte et al., 2011; Jansen 2002; Potter, 2008; Weinberger et al., 2019). As a result, cannabis markets have reorganized from the ground up, reshaping how the drug is produced, accessed, and controlled.

A second, related development is the 'democratization' of cannabis markets (Ancrum & Treadwell, 2017; Weinberger et al., 2019). While large-scale cultivation remains associated in some contexts with profit-driven actors and organized crime, vast numbers of small-scale growers—often with no ties to criminal subcultures—now contribute substantially to local supply through 'social' and 'social-commercial' distribution (Hough et al., 2003; Lenton et al., 2015; Potter & Klein, 2020; Søgaard et al. 2025). This dispersed, low-threshold mode of production complicates conventional theories of drug markets, which typically focus on trafficking, professionalized distribution, and violence (Sevigny et al., 2025). It also raises new questions for criminology and drug policy about who participates in production, how cultivation practices evolve, where growers intersect with (or avoid) organized market structures, and how policy regimes shape these dynamics.

Policy environments have diversified accordingly. In some jurisdictions, small-scale cannabis cultivation is lawful within certain regulatory parameters (e.g., plant limits, THC thresholds, registration requirements) (Aguiar and Musto, 2022; Bundesgesetzblatt, 2024; Granville et al. 2025). Elsewhere, cannabis cultivation is decriminalized but remains illegal, attracting civil rather than criminal penalties. In most countries, however, growing cannabis continues to be prohibited, even where personal use has been decriminalized (Quintas & Arana, 2017). Parallel shifts include the World Health Organization's recommendation to reschedule cannabis to acknowledge medical utility (WHO, 2020) and the spread of national medical cannabis

programs (de Souza et al., 2022; Søgaard et al., 2021). At the same time, several jurisdictions have moved toward adult-use decriminalization or legalization, including fully regulated consumer markets in Canada and multiple U.S. states (Decorte, Lenton, & Wilkins, 2020). This heterogeneity provides a natural laboratory for examining how policy design influences cultivation patterns and market participation.

Against this backdrop, our international research team first surveyed small-scale cannabis growers across eleven countries in 2012-13 to examine who cultivates, why, and with what connections to broader drug markets (Potter et al., 2015). We found that growers diverged sharply from stereotypical depictions of drug market actors. Participants spanned sociodemographic profiles rather than clustering in marginalized or subcultural groups; most were motivated by considerations other than profit; and, setting cannabis-related offences aside, they reported very low levels of other criminal involvement. In short, small-scale cannabis growers appeared more 'normal' than 'deviant,' a pattern that held across the countries we studied.

A decade later, we return with a second cross-national survey to assess continuity and change in the world of cannabis cultivation. Since our earlier study, policy experimentation has accelerated, medical cannabis has been rediscovered and mainstreamed, and horticultural and technological innovations have lowered barriers to home growing. Yet cross-national evidence on growers remains sparse, with much of the literature confined to single jurisdictions and limited generalizability (Azofeifa, et al., 2021; Bouchard et al, 2009; Hammersvik et al., 2012; Paoli et al., 2015; Wilson et al., 2019). Calls to understand how cultural and national contexts shape cannabis use and its consequences (Rafei et al., 2023) apply equally—and urgently—to cultivation.

This paper offers three contributions. First, it provides an updated, comparative portrait of small-scale growers across 18 countries, documenting demographic profiles, cultivation

methods and experiences, and the extent and nature of drug-market and criminal justice involvement. Second, it situates these patterns withing evolving policy environments to consider how regulatory design may structure opportunities, risks, and pathways into (and out of) criminal exposure. Third, it revisits core claims from our earlier study—regarding the 'democratization' of supply, the predominance of non-profit motivations, and the limited overlap with traditional criminal enterprise—to assess their durability in a transformed global landscape. We close by placing our findings in conversation with the existing literature on small-scale cultivation and discussing implications for criminological theory and drug policy.

Methods

Data collection

This is the second round of data collection using the International Cannabis Cultivation Questionnaire (ICCQ), which we first ran (ICCQ 1; Decorte et al., 2012) in eleven countries (Austria, Australia, Belgium, Canada, Denmark, Finland, Germany, the Netherlands, Switzerland, the UK, and the US) across 2012-2013 (Potter et al., 2015). Two additional countries (Israel and New Zealand) deployed ICCQ 1 in 2016-2017 (Wilkins et al., 2018). Our overall methodology during the second round was consistent with the first (Barratt et al., 2012; Barratt, Potter, et al., 2015), but with a further five countries (France, Georgia, Italy, Portugal and Uruguay) joining the thirteen that participated in Wave 1.

The ICCQ is a standardized online survey targeting small-scale cannabis growers. It consists of a 40-item core component asking questions about respondents' use of cannabis and other drugs; cannabis growing experience; methods and scale of growing operations; reasons for growing cannabis; participation in cannabis and other drug markets; contacts with the criminal justice system in relation to cannabis growing; involvement in other (non-drug related) criminal activity; and demographic characteristics. The updated version of the ICCQ also included nine optional modules exploring other aspects of cannabis cultivation in more detail. While the core

component was asked of all respondents in the 18 participating countries, the optional modules varied by country depending on local (researcher and policy) interests. We kept the 35 core questions administered in Wave 1, but refined or added questions and response options based on participant feedback from the original survey, changes in cannabis cultivation practices, and policy changes and other global events (including adding questions about COVID-19). This paper presents findings from the core component of the second wave only.

Our survey was built and hosted on Qualtrics through Curtin University. The survey did not ask for personally identifiable information and did not record IP addresses, ensuring anonymity for our respondents. We secured ethical clearance centrally through Curtin University (HRE2019-0542), but also sought and received ethical clearance from our respective institutions where required by local or national policies.

The target population for our survey was predominantly adult (18+) small-scale cannabis growers. Although large-scale growers were also welcome to respond to our survey, we expected few of them to participate. Large-scale growers operating illegally run greater risks of incarceration if identified, and while large-scale legal growers may not fear criminal justice repercussions, there are other reasons to expect lower participation levels from this group (e.g., proprietary cultivation techniques).

Due to the anonymity they provide and the ease of reaching geographically and socially disparate populations, online surveys have become an established approach for researching populations involved in certain types of illegal activity, including drug use and drug dealing (e.g., Barratt, Ferris and Lenton, 2015; Barratt et al., 2017; Coomber, 1997; Kays, Keith and Broughal, 2013; Matias et al., 2019; Miller and Sønderlund, 2010). Because cannabis growers often operate in sensitive or illegal environments, recruitment of respondents can be a challenge. We recruited respondents primarily via convenience and snowballing techniques. We also note that there are inherent limitations to the use of anonymous online surveys when surveying hidden

populations, and that we cannot know how representative our sample is of the broader population of cannabis growers (see Limitations section for a more detailed discussion).

Exact strategies for recruitment varied across the participating countries, depending on available resources and contacts in cannabis-related networks, organizations, and businesses. Although details differed between data collection rounds as well as between countries, our overall approach to recruitment was consistent with the Wave 1 survey. Countries drew on a mixture of online and offline recruitment techniques, including handing out fliers at events or legal cannabis businesses, social media engagement, articles and interviews with mainstream and specialist media, and recruitment drives through websites and membership/customer distribution lists of cannabis-related organizations and businesses. We did not pay or otherwise incentivize any individuals, organizations, or businesses to support our recruitment campaigns.

All recruitment campaigns directed potential respondents to our project website (worldwideweed.nl) where respondents could proceed to the survey by clicking on their country's flag which led them to the survey translated into their language. Only when respondents indicated that they had read and understood the disclosures, met the inclusion criteria, and consented to participation would they be directed to the survey. The survey was live from August 2020 to September 2021.

Eligibility and sample size

A total of 19,444 people started our survey. Of these, 11,479 respondents were included in the final analytic sample after removing duplicates and applying the following inclusion criteria: aged 18 or older, grew cannabis within the past five years, resided in one of the 18 participating countries, and provided valid answers to at least half the core module questions. Individual country samples ranged from 44 in Austria to 2,107 in Belgium (Table 1).[1] While we

[1] Participating countries appear in tables in alphabetical order by international standard (ISO 3166) country codes: Australia (AUS), Austria (AUT), Belgium (BEL), Canada (CAN), Switzerland (CHE), Germany (DEU), Denmark (DNK), Finland (FIN), France (FRA), the United Kingdom of Great Britain and Northern

acknowledge that larger samples are not necessarily more representative, the smaller sample sizes obtained for certain countries does limit our ability to draw meaningful comparisons. Still, the data from these countries contribute to our overall understanding of small-scale cultivators across this group of 18 nations.

Analysis

We used Stata and SPSS for analyzing data. Data cleaning included recoding or upcoding free-text 'other' responses where these appeared to fit with existing response categories (recoding) or where multiple respondents reported similar responses (upcoding). Recoding and upcoding were carried out by small teams, then cross-checked by other team members for consistency and accuracy. For the purposes of this paper, we primarily report descriptive statistics, with some simple tests of relationships between variables, including comparisons of medians across groups: Wilcoxon rank-sum (Mann-Whitney) tests and Kruskal-Wallis equality-of-populations rank tests. We report results for valid, nonmissing responses to our survey questions, with missingness on specific indicators ranging from 0% (age) to 12% (cohabitants). Some analyses use subsets of the grower sample (e.g., those who grew cannabis in the past year). For all analyses, we report the base sample size with the results.

Findings

Demographics of growers

The demographic profiles of our respondents were broadly similar across countries, although we observed some notable differences. As with our previous survey, the gender balance of respondents (Table 1) was heavily skewed towards men (86% male, ranging from 61% in New Zealand to 94% in Georgia). While remaining high, male predominance among cannabis

Ireland (GBR), Georgia (GEO), Israel (ISR), Italy (ITA), the Netherlands (NLD), New Zealand (NZL), Portugal (PRT), Uruguay (URY), and the United States of America (USA).

growers has diminished compared to 2012-13, when 92% of growers were male[2]. Given the shifting policy landscape toward liberalization, this finding is consistent with Miesel et al. (2025) who found that men were relatively more likely to grow cannabis in illegal contexts but women were more likely to grow in legal settings in legally compliant ways.

Our sample of growers primarily ranged from young-adults to early middle-age (IQR 27-49), with an overall median age of 37, which is 10 years older on average than growers from the 2012-13 survey (median 27; IQR 22-36). Table 1 also shows considerable age variation across countries, with the median age of growers ranging from 24 in Italy to 53 in the USA.

Table 1 about here

Our data collection period overlapped with the height of the COVID-19 pandemic, which affected employment and economic activity in many countries (Werse et al., 2025). Nevertheless, even with 5% of our growers reporting being unemployed as a direct result of the COVID 19 pandemic, 46% of respondents were employed full-time, outpacing the 41% observed in 2012-13. Overall, a majority (58%) of our growers were employed in some manner, with just three countries at or below 50% (i.e., Italy, Finland, and New Zealand). More than one-fifth (22%) were current students compared to 27% in 2012-13.

Table 2 about here

Respondents' household arrangements (Table 3) varied considerably across countries, which is indicative of different demographic profiles and cultural traditions. For example, Italians - the youngest national sample - were the most likely to live with parents. Across the whole sample,

[2] We included a non-binary response option in Wave 2, which had been absent from Wave 1. For most countries, and across the sample as a whole, the proportion of respondents choosing this option was 1% or lower although this was 3% for New Zealand and 7% for Austria (the smallest sample in the survey overall) – and 0% for Israel.

the majority (55%) lived with a partner, compared to just 38% in 2012-13. Sizable minorities lived alone (19%; 27% in 2012-13) or reported living with minor children (22%; 17% in 2012-13).

Table 3 about here

Cannabis and other drug use

With respect to age of first cannabis use (Table 4), most respondents (43%) initiated during early adolescence, with variation across countries that is consistent with national surveys (e.g., EMCDDA, 2020; UNODC 2020). For instance, half or more of respondents from Italy, New Zealand, and USA initiated cannabis use by age 15, whereas only about one-quarter of our growers from Finland and Israel had initiated by this age. Overall, a majority (72%) of respondents initiated cannabis use before turning 18, which is higher than 2012-13 (68%). Unsurprisingly, cannabis growers mostly report regular or heavy use of cannabis, with more than three-quarters of respondents reporting use within the past week. Among the 90% of our growers who used cannabis within the past month, the median number of days used over that month was 30, indicating the typical grower is also a daily cannabis user.

Table 4 about here

When asked about nonmedical use of other substances in the past year (Table 5), a majority of respondents (75%) reported using alcohol (compared to 79% in 2012-13), ranging from a low of 61% in the USA to 83% in Belgium. Nearly three-fifths (59%) reported using tobacco products in the past year, which ranged from 33% in the USA to 82% in Georgia. This is notably lower than 2012-13 (69%), especially in the USA (33% compared to 53% previously). Just under one-third (31%) of respondents reported using any illicit drug other than cannabis in the past 12 months, which is also lower compared to the previous survey (37%). While there was substantial variation across countries, past-year prevalence was greatest for psychedelics/empathogens, including magic mushrooms (15%), MDMA/ecstasy (10%), and LSD (9%). Prevalence of powder cocaine (10%) was also relatively high among our growers, which is consistent with the general

increase in cocaine use reported in many countries in recent years (EUDA, 2024; Hellman, 2024). Otherwise, prevalence of other drugs was in the single figures, with crack cocaine and heroin use reported by only about 1% of our growers.

Table 5 about here

Growing experiences

Our typical grower cultivated their first cannabis crop in early adulthood, at a median age of 23 (IQR 19-32) (Table 6), although the typical novice grower was relatively older in the UK (30), USA, (29) and Canada (27) but younger in Italy (19). Still, all countries except Austria and Georgia included respondents who started growing in their 60s or later, whereas all countries except Austria, UK, and Finland included growers who first cultivated cannabis at or before the age of 11. Compared to our previous survey in which the median age of first grow was 20 years (IQR 12-25), growers in 2020-21 were starting later, although predominantly still in young adulthood.

Although starting later in life, growers in our second survey are generally more experienced (Table 6): only 16% had commenced growing or harvested a single crop compared to 22% in 2012-13. While most growers (36%) had harvested just 2-5 crops, a sizable share (17%) reported more extensive cultivation experience, having harvested 21 or more cannabis crops in their lifetime (compared to 10% in 2012-13). Highly experienced growers (21+ harvested crops in lifetime) were most common in Denmark (44%) and New Zealand (27%) but least common in Italy (7%) and Belgium (8%).

Table 6 about here

Growing methods and scale

Research indicates that cannabis growing methods are evolving, including the types of chemicals (e.g., insecticides, fertilizers) commonly used to cultivate cannabis (Lenton et al., 2025). Here, we report on the location and size of grower set-ups. While the single most

common location for growing cannabis (Table 7) was indoors (40%), most respondents grew exclusively or partly outdoors (60%), reflecting a shift toward (partial) outdoor growing compared to 2012-13 (49% and 51%, respectively). As would be expected of our sample, growers mostly operated on a small scale in terms of both crop and plot sizes, with a median of 4 plants per crop (IQR 2-6) and 2.3 square meters (IQR 1-9) of grow space. These figures are consistent with those reported in the 2012-13 survey: 5 plants per crop (IQR 3-9) and 2 square meters of cultivation space (IQR 1-5).

Table 7 about here

With respect to scale, our data on cannabis yields (Table 8) reminds us that even small set-ups can produce sizable quantities of cannabis. Growers in our current sample reported median yields of 57 grams per plant (IQR 28-113g) and 300 grams per crop (IQR 113-870). These numbers were up compared to 2012-13, with a median of 40 grams per plant (IQR: 28-113) and 201 grams per crop (IQR 91-499).

Table 8 about here

Yield was statistically related to grow location. The median yield per plant was higher for growers who used both indoor and outdoor grow spaces (60 grams, IQR 31-130) or transplanted seedlings from indoors to outdoors (median 60g, IQR 28-170), but lower for those who grew exclusively indoors (54g, IQR 28-99) or outdoors (51g, IQR 20-150). A Kruskal–Wallis equality-of-populations rank test confirmed that the yield per plant was significantly different by grow setting ($\chi^2(3) = 49.2$, $p < 0.001$).

Reasons for growing

Although there are some interesting between-country variations, broad similarities exist across all countries regarding common reasons for growing (Table 10). As with our previous survey, the predominant motivation for growing cannabis involved the pragmatic purpose of growers

providing themselves or others with cannabis for recreational or medical purposes, with 91% of respondents acknowledging this reason (ranging from 75% in Italy to 98% in New Zealand). Growing for purposes of aesthetics (79%) and quality control (77%) also resonated among our sample of growers. With respect to the latter reason, the majority of growers felt they could produce cannabis that was healthier (64%) and adulterant-free (55%) compared to the cannabis they could buy. The majority of growers in our international sample were also motivated by risk reduction (64%) and economic (63%) incentives. Risk reduction motivations for growing cannabis exhibited more cross-country variation than other reasons, ranging from 26% in Georgia to 82% in Austria—differences that were driven by variability in the presence of criminal networks and the legal policy environment. Further, economic motivations for growing cannabis centered primarily on the fact that it was cheaper to grow than buy, whereas the ability to sell cannabis for a profit or to cover expenses was rarely cited as a singular motivation for growing. Lastly, convenience (48%) was an oft-cited motivation for growing cannabis, whereas ideological (35%) and COVID 19 related (17%) reasons, though relevant, were referenced less often as general motivations for growing. Still, important variations by country were observed, as exemplified by 32% of Portuguese and 30% of Italian growers citing COVID 19 related reasons for growing cannabis—two southern European countries that went through particularly restrictive/extended periods of lock-down (Al-Salem et al., 2021) and whose traditional cannabis import markets may have been particularly disrupted by COVID-related restrictions (Werse et al., 2025).

Table 9 about here

Market participation

As was the case in 2012-13, a higher proportion of our growers reported that they had sold cannabis for profit (9%; Table 11) than reported selling for profit as a reason to grow (5%; Table 10). Involvement in supplying cannabis through giving away or sharing (62%) was more common

than selling and speaks to the overall pattern of small-scale growers being widely involved in the 'social supply' of cannabis but generally not involved in commercial or profit-oriented levels of the market. There are exceptions to this rule, with 27% of all growers who reported selling cannabis in the last 12 months (n=176, <2% of all the growers we surveyed) reporting that greater than half of their income came from selling cannabis.

Table 10 about here

Selling (either for profit or to cover costs) was associated with higher total crop yield (z = -17.95, p < 0.001). Sellers reported a median crop yield of 499 grams (IQR 227-1556; n = 1360) while non-sellers reported a median crop yield of 249 grams (IQR 99-601; n = 5205). Commercialization is also tied to larger yields. Growers who sold more cannabis for profit in the past year (i.e., 0%, 1-24%, 25-49%, 50-74%, 75-100%) reported significantly greater yields both per plant ($\chi^2[4] = 75.91$, I < 0.001) and per crop ($\chi^2[4] = 445.72$, I < 0.001). For instance, the median yield per plant was 113 grams for growers who sold 75% or more of their product for profit compared to 57 grams for those who did not sell any product for profit. Likewise, the respective median yield per crop was 4990 grams and 255 grams.

A final indicator that our cannabis growers, while often involved in cannabis supply, were mostly separate from wider involvement in drug markets is that only 7% reported selling cannabis they had not grown themselves, and only 2% reported selling drugs other than cannabis (Søgaard et al., 2025).

Police contact and other illegal activity

Although cannabis cultivation is legal in some forms in an increasing number of jurisdictions around the world, it remained a criminal offence in most of the jurisdictions we covered at the time of the survey. Even where respondents live in countries with options for legal growing, many growers fail to operate within legal parameters. Overall, 14% of growers reported that they were growing legally (Table 11), with most of these residing in Canada (73%), Uruguay (68%),

and USA (46%)—the three countries that have seen the emergence of fully-regulated legal markets for recreational cannabis.

Generally, growers perceived the risk of being caught by the police for growing to be low or moderate, with less than a fifth (19%) reporting the risk as 'high' or 'very high' (Table 11). In the countries with widespread legal growing (Canada, Uruguay, USA), perceptions of risk were generally lower than in other countries even among those who were not growing within the legal parameters of their jurisdictions. By contrast, a sizable share of growers in Italy (59%), Georgia (48%), and France (45%) perceived the risks of cultivation as high or very high. There appeared to be little relationship across countries between perceptions of risk of getting caught and actual experiences of contact with the police. Overall, 12% of respondents had experienced contact with the police in relation to their growing activities (Table 11), with Finland (28%) and Switzerland (25%) having the highest rates. None of the growers from Portugal, with its long-established policy of decriminalization of drug use, reported police contact. Among growers who experienced police involvement, close to half reported being arrested (46%) or criminally charged (45%) because of growing cannabis. However, custodial sentences were a relatively rare outcome with only 13% (i.e., 1% of our total sample) reporting imprisonment.

Table 11 about here

Beyond crimes related directly to cannabis growing and drug use, growers in our sample were predominantly law-abiding (Table 12). Fewer than 10% reported engaging in any other illegal activity in the last 12 months. For those who did, most reported either driving offences (which also accounted for most of the variation across countries in overall levels of reported illegal activity) or non-criminal offences. Only 1% of our total sample reported involvement in property offences, and less than 1% reported involvement in violent crime, in the past 12 months, and only 2% reported ever having been found guilty of a property or violent offence.

Table 12 about here

Discussion

Overall, the profiles of cannabis growers and the patterns of cannabis growing reported by our respondents in all 18 countries had more similarities than differences. This adds further support to the observation that cannabis growing is an increasingly globalized activity (Decorte & Potter, 2015): not just that cannabis growing occurs all over the world, but that it takes on remarkably similar forms in a range of different countries. Although we acknowledge heterogeneity within our sample, we can make some general observations about the population of small-scale cannabis growers who participated in our survey.

First, cannabis growers are broadly representative of the wider population in demographic terms. As with participation in other illegal drug markets (Maher and Hudson, 2007), our sample of cannabis growers was predominantly male—although less markedly so than in our 2012-13 survey. Aside from the gender disparity, respondents to our survey in all countries came from a wide range of socioeconomic and demographic backgrounds. Although predominantly young-to-middle-aged adults, they are drawn from all age groups. They are more likely than not to be economically or educationally active. Respondents were drawn from a full range of household types, which supports the argument that household populations can be a useful unit of analysis for understanding cultivation behavior (Azofeifa, et al., 2021). Any idea that cannabis cultivation might be an activity primarily restricted to certain marginalized, deviant, or subcultural groups is not supported by our data.

Second, aside from cannabis-related activity and other recreational drug use, growers in our sample were not particularly involved in criminal activity. One way in which cannabis growers differ from the general population is that cannabis growers report relatively heavy use of cannabis, a finding that is consistent with national estimates from the US showing cannabis growers were significantly more likely than non-growers to report using 300+ days in the past year (Azofeifa, et al., 2021). Given that daily or near-daily use of cannabis has been linked with

greater self-reported severity of dependence among cannabis growers (Sznitman et al., 2025), targeted responsible use messaging could be beneficial for this population.

Regarding other substances, most of our respondents consumed alcohol, but one-quarter did not, which is consistent with national-level data (Eurostat, 2019). Over half of our respondents used cigarettes or tobacco, which is higher than general population smoking rates reported in most countries and indicative of the complementary mixing of tobacco and cannabis for smoking (Russell et al., 2018). Nearly a third of our respondents reported past-year use of illicit drugs other than cannabis, which is higher than the rates reported in most countries. The most prevalent drugs were magic mushrooms (15%), MDMA/ecstasy (10%), powder cocaine (10%), and LSD (9%). Conversely, heroin, methamphetamine, crack cocaine, and synthetic cannabinoid use was minimally prevalent (1-2%) among growers. Accordingly, while growers in our sample are more likely to report other drug use than the general population, illicit drugs that are more likely to be associated with overdose and other adverse events are not particularly prevalent among these growers.

Apart from their involvement with cannabis-related crimes (possession, supply, and cultivation offences), our sample reported low levels of criminal activity—particularly for more serious property and violent offences. Again, this points to small-scale cannabis growers being drawn from largely 'conventional' backgrounds rather than deviant subpopulations, which is consistent with research that shows that cannabis offenders do not have greater criminal propensities than the general population (e.g., Pedersen & Skardhamar, 2010). An extension of this point is that small-scale cannabis growing, which tends to be a peaceable activity (Sevigny et al., 2025), can preclude potentially risky transactions within broader illegal drug market ecosystem.

Third, cannabis growers are often drug suppliers—but are generally not motivated by profit. Instead, most of the growers in our sample were involved in 'social supply' (i.e., giving away,

swapping, or selling small amounts) (e.g., Bræmer and Søgaard, 2023; Coomber and Moyle, 2014; Coomber, Moyle and South, 2016; Potter, 2009; Søgaard et al., 2025). The fact that more growers reported they sold the cannabis they grew than reported selling as a motivation for growing fits with behavior reported elsewhere in the literature where cannabis growers sell some of their product out of convenience—not because profit was a motivating reason for cannabis growing (Potter, 2010). Growers may take up market opportunities where they exist, but the vast majority do not actively seek to profit from their cultivation activities. Indeed, rather than being involved in crime generally or in wider drug markets, the main motives cited for growing point to pragmatic reasons (provision of cannabis to self and others), intangible benefits of growing cannabis, quality control of product, and avoidance of harms and risks associated with illegal cannabis markets.

There were exceptions to the lack of profit motivation in all countries—clearly some cannabis growers, even operating at a small scale, become actively involved in dealing for profit—but such examples were small minorities. The countries with the highest proportions of growers with large shares of their incomes coming from growing activities were the USA – where many of these growers would be operating in jurisdictions that allow for some legal commercial cultivation – and the Netherlands – where illegal commercial cultivation is both longer established and, often, tacitly tolerated in the context of the coffeeshop system.

Fourth, we have some evidence that small-scale growers may be getting better at producing cannabis as new technology and growing techniques developed in the context of organized legal markets also influence small-scale growers. In general, our 2020-21 respondents reported more outdoor grows and a greater number of grows overall than the 2012-13 sample. While this shift is partly attributable to the addition of new countries (most notably, only 12% of Uruguayan respondents reported typically growing indoors), there are clear differences in overlapping countries between the two survey waves (e.g., 66% of UK and 53% of US growers reported that

they typically grow indoors in Wave 2 compared to 76% and 80%, respectively, in 2012-13) with an overall trend away from indoor growing. In countries where regulated markets have been introduced, the move toward outdoor growing may reflect (perceived or actual) reductions in risk associated with more visible outdoor growing.

A notable finding relates to growing methods and yield. Our respondents this time around reported higher yields per plant than in the 2012-13 survey. In general, this may reflect the efforts of cannabis-cultivation entrepreneurs in developing growing equipment, seed-strains, and cultivation techniques that seek to maximize yield. The internet, along with an increasingly globalized economy and related logistics and communications, makes seeds, technology, and knowledge emerging in legal jurisdictions readily available to growers in other countries, even where local laws still criminalize cannabis growing. However, it is important to note that the individual countries that show the largest increase in average yield across the two iterations of our survey, Canada and the US (both reporting a median yield of 31 grams per plant in 2012-13 compared to 99 grams per plant in 2020-21), are the countries that have introduced legal recreational markets. While technological developments may have enabled growers to produce larger yields, our results suggest that commercialization is a key driver.

Our analysis also revealed that growers who combined indoor and outdoor methods achieved higher yields than those using either method exclusively. This makes intuitive sense, as cannabis plants can grow larger outdoors while being protected from predation or weather during their vulnerable early growth stages indoors. The higher yields among those using mixed methods may also reflect greater expertise and attention to cultivation practices. However, there may be other factors at work here, such as climatic and agronomic conditions, population densities and outdoor grow space, and newer seed varieties bred for indoor or outdoor conditions.

Fifth, small-scale cannabis growing is a relatively low-risk activity. A particularly interesting finding was that in countries with widespread legal growing (Canada, Uruguay, and USA), perceptions of the risk of being caught were generally lower than in other countries, even among those who were not growing within the legal parameters of their jurisdictions. This suggests that cannabis policy reform may have broader effects on risk perception beyond just those operating within legal frameworks, potentially indicating a cultural shift in how cannabis cultivation is viewed and how illegal growing is policed. Overall, however, while a sizable minority of our respondents estimated a high or very high risk of being caught by the police, a much smaller proportion reported ever having actually come into contact with the police for their cannabis growing. Of those who did, very few served a custodial sentence. This suggests both that cannabis growers overestimate the risk of arrest and that criminal justice agencies are either quite limited in their ability to effectively police small-scale cultivation or that they tacitly tolerate it. Of course, given the low level of involvement in drug dealing or other more serious criminal activity, this apparent deprioritization of enforcement efforts against small-scale growers may be an appropriate response by the criminal justice system—but may also send out mixed messages in countries where prohibition remains the default policy framework for cannabis.

Taken together, our findings provide some important insights into small-scale domestic cannabis production—and the people involved in this activity. In particular, we can add to the theoretical concept of 'democratization' of cannabis markets (Ancrum and Treadwell, 2017): the expanding participation in cannabis production and distribution by individuals outside traditional criminal and 'deviant' subcultures. Our findings support this, showing that small-scale growers come from broadly conventional backgrounds, typically have minimal involvement in other criminal activities, and are primarily motivated by personal use rather than profit—although most participate in cannabis distribution in the form of 'social supply'. As producers and (often) distributors of cannabis, small-scale growers are drug market

participants—but ones that operate separately, and very differently, from the serious and organized criminals that traditionally dominate illicit drug markets.

Limitations

There are many reasons to question how representative our samples are of the national populations of cannabis growers. Our participants were self-selecting, recruited through opportunity and snowball sampling techniques. In most jurisdictions covered, cannabis cultivation remains a criminal offence—and even in countries with legal opportunities to grow cannabis, many of our respondents were not in full compliance with the law. As active participants in illegal activity, cannabis growers are a hidden and secretive population. As such, our survey is likely to under-represent larger scale growers, those more heavily involved in drug markets or other types of serious crime, or those who are more risk averse. As an online survey that relied heavily on online and social media recruitment methods, our sample is also likely to be skewed away from those who are less computer literate or who do not spend much time online. As the survey did not include a financial incentive, it may also have been more biased towards engaged and activist type cannabis growers, who would be more willing to volunteer their time to this kind of project. Further, as our recruitment strategies varied to some degree between participating countries, any biases and (un)representativeness in our samples may also vary across jurisdictions: cross-country differences may be as much about different recruitment strategies as genuine differences in each country.

The responses from the questionnaire are self-reported, which introduces potential biases such as recall errors and social desirability. However, anonymous surveys conducted without financial incentives create a more conducive environment for participants to disclose sensitive information (Kays et al., 2013). Furthermore, a recent systematic review demonstrated that self-reported data are a reliable indicator of drug use when corroborated by biological markers (Bharat et al., 2023). Finally, although we have now conducted the survey twice in 13 of our

participating countries, differences in recruitment methods between data collecting rounds, as well as the complicated changes in legal, cultural, and other factors that also vary by country, limit our ability to make statistical comparisons across time.

However, it is worth pointing out that it is impossible to know what a representative sample of a hidden population would look like. Questions of representativeness are inherent to all research that seeks to investigate criminal involvement, but such research can still give us important insights into such activities. Notably, previous research has shown that the sociodemographic and drug use characteristics of comparable convenience samples and matched sub-samples from representative surveys were broadly similar for both growers (Barratt and Lenton, 2015) and consumers (Barratt et al., 2017).

Although variations in recruitment methods across countries—and across the two waves of the survey—existed, there was commonality in our overall methodological approach. This, and the overall high number of respondents gives us some confidence in making a number of meaningful observations, at least in terms of general profiles of small-scale cannabis growers. Nevertheless, we cannot be sure about how representative our samples are of broader cannabis-growing populations in any of our countries and there are clear limits to our ability to make claims about cannabis growing, or cannabis growers, more generally.

A further limitation is that the data were collected in 2020-2021, 5 to 6 years before this paper was published. Developments in cannabis growing technology and policies governing cannabis across our participating countries may have changed during this time which this dataset cannot account for.

Conclusions

Although our samples cannot be assumed to represent all small-scale cannabis growers, the cross-national data presented here provide clear insights into how domestic cultivation fits

within the broader transformation of global cannabis markets. Across 18 countries, growers reported remarkably similar demographic profiles, motivations, and patterns of participation, reinforcing the now well-established picture of cannabis cultivation as a widespread, globalized, and largely ordinary activity rather than one concentrated among marginalized or criminally entrenched groups.

Our findings also substantiate the "democratization" of cannabis markets (Ancrum & Treadwell, 2017). Small-scale growers are active participants in drug production and distribution, yet their activities are primarily motivated by personal use, social exchange, and pragmatic concerns such as quality, cost, and safety. While many engage in some form of social supply, few pursue cannabis growing as a profit-driven enterprise or exhibit meaningful involvement in broader criminal markets.

At the same time, domestic cultivation appears to be becoming more sophisticated. Higher yields, increasing use of mixed growing methods, and the diffusion of knowledge and technology from legalized markets show how innovations in regulated contexts spill over into informal production. These patterns suggest that small-scale growers are adaptable actors whose practices evolve alongside shifts in policy, commercial availability, and cultivation techniques.

Finally, small-scale cultivation continues to carry relatively low levels of enforcement risk. Perceived and actual detection rates were modest across countries, and jurisdictions with legal cultivation frameworks showed even lower risk perceptions—indicating that policy reforms may influence enforcement norms and cultural attitudes more broadly.

Taken together, these findings highlight small-scale growers as central, but often overlooked, participants in contemporary cannabis markets. They underscore the need for drug policy and criminological theory to account for this large and diverse group operating at the margins of legality, shaped by both global market transformations and local regulatory environments.

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Table 1: Gender and age of respondents

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Gender (%)	Male	82	80	90	83	88	92	81	89	92	83	94	91	87	85	61	87	77	82	86
	Female	18	14	10	15	10	7	19	10	7	16	5	9	11	14	36	12	22	17	13
	Non-binary	<1	7	<1	1	1	1	1	1	1	<1	1	0	1	1	3	1	1	1	1
	Total N	723	44	2084	513	277	787	873	524	681	340	215	87	1350	355	197	111	340	1807	11308
Age[a]	Median	46	34.5	33	41	37	33	40	36	36	47	29	28	24	42	47	31.5	28	53	37
	IQR	35-56	26-47	25-41	33-51	29-49	25-41	29-53	29-44	29-45	39-55	24-36	23-35	20-33	31-53	37-58	26-40	22-36	40-63	27-49
	Range	18-80+	18-71	18-80+	18-77	18-74	18-77	18-80+	18-70	18-75	18-80+	18-60	18-68	18-69	18-79	20-79	19-70	18-77	18-80+	18-80+
	Total N	732	44	2107	519	282	801	883	536	690	341	218	87	1400	359	198	114	342	1826	11479

Note: Percentages mat not sum to 100% due to rounding.

[a] Age was limited in the survey to 18 to 80 years, with 80 representing “80 or older”.

Table 2: Current employment and studying status

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Employment status (%)	*Employed*	53	69	69	67	69	68	53	48	62	55	55	58	47	58	50	71	67	51	58
	Full-time	38	43	58	56	51	51	41	39	55	41	48	43	36	41	40	65	48	42	46
	Part-time	12	26	9	8	17	14	12	9	6	13	4	10	9	16	9	4	18	8	10
	Working with COVID 19 government supplement	3	0	2	3	2	2	1	<1	1	2	2	4	2	1	1	2	1	1	2
	Not Employed	47	31	31	33	31	32	47	52	38	45	45	42	53	42	50	29	33	49	42
	Furloughed due to COVID-19	1	0	1	1	2	1	<1	1	3	1	7	12	6	1	1	1	4	1	2
	Lost employment due to COVID-19	5	0	3	4	3	3	1	2	4	4	13	3	4	2	2	5	5	3	3
	Seeking work since before COVID-19	2	2	3	2	2	4	1	5	5	1	8	3	7	3	1	4	11	1	3
	Not working with COVID 19 government supplement	1	0	1	3	0	<1	0	<1	1	0	0	0	1	1	1	0	2	1	1
	Retired	13	2	3	11	6	3	13	9	4	15	2	1	1	9	15	3	3	28	10
	Homemaker	4	7	1	2	2	1	1	1	1	3	5	3	1	4	3	1	1	4	2
	Student	2	10	12	2	6	8	8	12	5	1	1	4	26	4	2	11	5	1	8
	Ill or Disabled	17	7	6	8	6	9	16	9	8	18	3	10	1	15	23	0	<1	10	9
	Unemployed	3	2	1	1	4	3	5	14	7	3	6	6	6	3	3	6	2	2	4
	Total N	638	42	1884	477	251	736	790	496	610	310	165	69	1241	304	182	109	265	1642	10211
Studying status (%)	*Current Student*	17	21	25	14	17	17	15	22	13	11	31	39	44	17	15	30	46	11	22
	Full-time	4	12	16	6	7	13	12	13	8	3	13	18	30	8	4	14	11	3	12
	Part-Time	12	9	9	8	10	4	3	9	5	8	18	21	14	9	10	16	35	8	10
	Not a Current Student	83	79	75	86	83	83	85	78	87	89	69	61	56	83	85	70	54	89	78
	Total N	638	43	1899	475	247	725	787	500	616	309	164	71	1235	312	183	111	265	1637	10217

Note: Percentages may not sum to 100% due to rounding.

Table 3: Household living arrangements

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Household Cohabitants (%)	Lived alone	16	27	16	10	24	30	32	44	24	26	16	10	9	27	19	14	11	15	19
	Spouse or partner	61	49	54	74	53	43	51	47	59	58	51	46	31	55	58	50	47	73	55
	Minor children	29	24	24	29	23	17	24	17	33	24	30	22	8	23	27	19	16	20	22
	Adult children	10	5	5	9	9	5	7	2	7	13	2	4	3	10	9	6	3	12	7
	Parent(s)	10	7	19	10	12	18	4	3	10	9	36	35	54	8	8	33	31	7	18
	Other family member(s)	7	5	11	6	10	10	2	1	3	3	27	17	35	3	6	17	25	5	11
	Friend(s)	4	2	4	1	2	2	4	<1	1	2	2	3	2	2	3	3	5	2	3
	Housemate(s)	5	12	6	5	6	6	4	2	4	2	2	9	4	5	11	4	2	2	4
	Total N	621	41	1886	464	248	730	777	484	611	307	162	69	1227	311	180	109	262	1614	10103

Note: Percentages may not 100% because multiple responses were possible.

Table 4: Cannabis use

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Age first used cannabis (%)	Never used	1	0	1	0	1	<1	1	0	<1	<1	1	0	<1	3	0	0	1	1	1
	<16	47	36	36	49	45	35	48	27	44	46	39	26	51	43	50	39	39	50	43
	16-17	24	32	35	24	32	34	24	22	33	22	23	30	32	30	21	35	30	23	29
	18-25	22	32	24	22	20	27	20	41	21	26	35	38	15	16	21	21	26	22	33
	>25	6	0	4	6	2	4	7	10	2	6	1	6	1	8	8	5	4	5	5
	Total N	728	44	2090	515	279	797	881	534	685	338	216	84	1393	356	197	114	339	1812	11402
Last time used cannabis (%)	Today	61	39	44	71	47	50	47	40	63	65	53	73	70	48	58	68	55	68	57
	Not today, but in the last week	22	43	32	20	32	30	29	35	22	25	27	18	19	34	27	19	32	20	26
	Not in the last week, but in the last 30 days	6	7	10	4	7	8	9	10	9	4	9	4	6	7	8	6	7	4	7
	Not in the last 30 days, but in the last year	6	9	9	3	7	9	9	11	5	3	7	4	4	5	6	2	4	4	6
	No cannabis use in the last year	4	2	4	2	7	3	5	4	2	3	3	1	1	4	2	4	1	4	3
	Never used cannabis	1	0	1	0	1	<1	1	0	<1	<1	1	0	<1	3	0	0	1	1	1
	Total N	716	44	2076	512	276	791	871	530	679	337	213	82	1380	353	194	114	335	1794	11297
Days of use in the last 30 days[a]	Median	30	27	25	30	30	26	28	22	30	30	25	30	30	30	30	30	25	30	30
	IQR	20-30	10-30	10-30	25-30	18-30	10-30	10-30	9-30	20-30	24-30	10-30	25-30	20-30	15-30	20-30	16-30	10-30	25-30	15-30
	Range	1-30	2-30	1-30	1-30	1-30	1-30	1-30	1-30	1-30	1-30	1-30	4-30	1-30	1-30	1-30	1-30	1-30	1-30	1-30
	Total N	574	34	1658	457	214	671	629	413	583	280	151	74	1154	285	154	98	258	1500	9187

Note: Percentages may not sum to 100% due to rounding.

[a] Sample restricted to respondents who reported using cannabis in the last 30 days.

Table 5: Other drug use for nonmedical reasons in the past 12 months

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Other nonmedical substance use in past 12 months (%)	Alcohol	72	81	83	77	82	72	73	81	77	64	74	74	82	73	63	76	82	61	75
	Cigarettes / tobacco	48	72	68	36	73	68	61	64	74	43	82	68	78	57	35	71	43	33	59
	Cannabis not grown by the respondent	56	47	63	68	57	66	50	62	61	50	64	81	79	62	62	63	59	52	62
	Illicit Drugs Other than Cannabis	*38*	*35*	*33*	*37*	*28*	*41*	*29*	*48*	*31*	*27*	*38*	*42*	*20*	*33*	*35*	*33*	*40*	*21*	*31*
	Synthetic cannabinoids	1	0	1	1	1	2	1	<1	1	0	8	0	<1	1	1	0	1	<1	1
	Methamphetamine	5	2	1	1	1	1	<1	6	1	1	4	0	<1	0	5	1	6	1	2
	Amphetamine	4	5	4	1	4	13	6	19	3	2	4	1	2	6	4	1	3	1	4
	Powder cocaine	13	7	15	6	13	10	13	10	15	7	6	9	8	13	2	12	15	2	10
	Crack cocaine	<1	0	<1	1	1	<1	<1	<1	2	<1	0	0	1	<1	0	2	1	<1	1
	Ecstasy (MDMA)	13	16	16	4	10	13	7	15	8	5	16	19	4	17	18	16	17	2	10
	LSD	13	16	7	5	10	15	6	14	7	5	13	13	5	8	16	15	28	4	9
	Magic mushrooms	18	16	15	32	10	17	17	30	13	15	9	22	9	14	14	9	9	14	15
	Heroin	1	0	<1	1	0	1	<1	1	2	<1	4	0	1	<1	1	1	1	<1	1
	Other opioids	8	5	1	3	2	4	4	11	4	3	9	1	1	1	11	0	1	3	3
	Benzodiazepines and sedatives	8	9	3	1	2	3	4	12	3	2	1	3	3	4	5	1	3	2	4
	Total N	675	43	1980	497	259	768	830	516	655	328	191	78	1325	337	189	108	306	1726	10811[e]

Note: Percentages may not sum to 100% because multiple responses were possible.

Table 6: Experience of cannabis growing

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Age of first grow	Median age in years	21	22	23	27	20	22	23	23	22	30	20	22	19	22	24	22	22	29	23
	IQR	17-30	20-28	19-30	19-36	17-27	19-30	18-35	20-30	18-29	21-42	18-24	18-27	17-23	18-35	18-32	20-30	18-29	19-46	19-32
	Range[a]	10-71	16-56	10-80	10-76	10-64	10-66	10-78	14-66	11-67	15-75	11-45	10-63	10-61	10-73	11-72	10-68	10-62	10-80	10-80
	Total N	729	44	2094	515	281	798	875	533	690	341	216	87	1387	357	198	112	341	1821	11419
Crops grown in lifetime (%)	0 (has not harvested first crop)	8	0	5	4	3	7	5	6	4	7	4	12	10	1	7	7	8	7	6
	1 crop	8	0	13	12	6	12	2	8	6	8	4	10	18	6	9	9	10	6	10
	2 to 5 crops	30	55	45	33	24	42	18	36	31	29	31	35	43	34	31	40	37	31	36
	6 to 10 crops	20	24	19	20	26	21	17	21	21	19	25	22	14	20	13	21	19	18	19
	11 to 20 crops	15	12	11	11	17	8	16	13	17	13	13	11	7	18	13	10	10	15	12
	21 to 50 crops	14	10	6	10	15	7	17	12	13	13	10	4	5	12	11	11	5	14	10
	51 to 100 crops	2	0	1	2	2	1	5	2	3	3	2	1	1	3	5	1	<1	3	2
	More than 100 crops	2	0	1	8	6	3	21	3	6	7	9	6	1	6	11	0	<1	7	5
	Total N	685	42	2019	489	258	779	808	483	644	317	201	83	1320	341	188	108	324	1759	10848

Note: Percentages may not sum to 100% due to rounding.

[a] Range was limited to “10 years or less” (≤10) and “80 years or more” (80+).

Table 7: Location and size of set-up

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Typical location of grow (%)	Indoors	27	55	28	37	32	56	30	68	45	66	28	57	39	27	33	62	12	53	40
	Outdoors	34	18	22	13	26	11	26	3	19	12	18	20	28	20	24	13	40	12	20
	Indoors and outdoors	29	20	23	32	28	24	26	25	29	17	43	9	29	28	32	19	25	24	26
	Seedlings grown indoors, then planted outdoors	9	7	27	18	14	10	18	5	7	5	11	14	4	25	11	6	24	11	14
	Total N	669	44	1994	496	272	741	838	507	663	315	202	76	1252	354	184	106	313	1691	10717
Number of mature plants per crop[a]	Median	4	6	3	4	6	4	5	4	4	4	3	3	3	5	5	4	5.5	5	4
	IQR	2-6	3-10	2-4	4-8	4-16	2-8	3-10	2-6	3-8	2-6	2-5	2-4	2-4	3-5	3-10	2-6	3-6	3-10	2-6
	Total N	623	27	1648	455	227	640	713	478	579	274	173	66	794	300	171	89	248	1572	9077
Space used to cultivate cannabis (m^2)[a]	Median	4	1.4	2	3.3	4	1.1	4	2.2	3	1.5	6	2.6	2	3	4	1.4	6	3	2.3
	IQR	1.2-9	0.6-4	1-6	1.5-9.3	1.2-15.6	0.6-4	1-16	1-9	1-10	1-4	1.6-225	1-938	1-15	1-14	1.5-12	1-4	2-14.2	1.5-11.1	1-9
	Total N	516	25	1488	408	202	589	598	436	520	248	121	60	598	257	139	79	186	1437	7907

Notes. Percentages do not necessarily add to 100% due to rounding. This table only shows those respondents who have harvested at least one crop.

[a] Only respondents who have harvested at least one crop and reported growing one or more mature plants per crop were included in this analysis. Upper range was limited to “More than 100 plants” (101).

Table 8: Yield in usable dried cannabis

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Typical yield per *plant* (grams)	Median	4.0	0.9	1.8	3.5	1.8	1.4	1.8	1.8	1.8	2.1	3.5	2.6	1.2	1.8	3.0	1.4	2.8	3.5	2.0
	IQR	1.8-10.6	0.5-1.8	0.9-3.5	1.5-7.1	0.7-5.2	0.7-2.3	0.9-3.5	0.9-3.5	0.9-3.5	1.1-4.0	1.6-8.8	1.8-5.3	0.7-2.5	1.1-3.5	1.8-7.9	0.7-2.8	0.9-8.8	2.0-8.0	1.0-4.0
	Total N	529	39	1725	418	232	639	595	409	556	243	157	70	1079	291	137	93	243	1375	8830
Typical yield per *crop* (kilograms)	Median	17.6	7.1	6.3	20.0	21.2	7.1	14.1	8.5	10.6	10.0	28.2	14.1	5.3	8.8	18.0	7.1	17.6	17.6	10.6
	IQR	7.1-60	3.5-17.6	2.8-14.1	8.4-61.0	8.6-42.3	2.8-15.9	5.3-35.3	3.5-17.6	5.3-24.7	4.0-21.2	9.4-44.1	3.5-35.3	2.1-14.1	4.2-35.3	8.0-40.0	3.0-14.5	8.5-35.3	8.0-64.0	4.0-30.7
	Total N	529	39	1725	418	232	639	595	409	556	243	157	70	1079	291	137	93	243	1375	8830

Note: This table excludes growers who have not yet harvested a crop.

Table 9: Reasons for growing

Reasons for growing (%)	AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Medical/Recreational	95	93	90	95	89	97	95	96	91	97	82	94	75	91	98	94	83	95	91
To provide myself with cannabis for recreational use	61	66	76	67	69	77	64	72	72	62	68	74	62	59	57	77	75	58	67
To provide myself with medical cannabis	74	59	33	64	37	56	61	76	53	70	39	44	30	55	85	64	31	70	53
To provide others with medical cannabis	28	18	8	28	15	17	21	27	15	22	10	16	7	26	43	11	11	37	20
To provide others with cannabis for recreational use	16	16	14	38	16	17	16	20	11	13	21	14	6	25	26	6	10	30	18
Aesthetics	69	84	78	85	84	85	72	80	86	84	69	76	79	74	73	84	70	82	79
I get pleasure from growing cannabis	64	80	72	83	82	81	67	76	83	82	66	73	74	72	68	79	64	81	75
Because the plant is beautiful	53	66	57	67	69	70	52	61	67	61	51	45	65	57	55	67	51	60	60
Quality Control	70	89	75	71	77	90	72	79	87	86	48	72	87	79	71	79	67	70	77
The cannabis I can grow is healthier than the cannabis I can buy	58	80	63	52	69	78	55	55	80	71	39	67	83	64	57	77	53	55	64
The cannabis I grow will never contain adulterants	47	82	54	41	55	84	58	51	54	59	26	45	66	62	49	62	42	46	55
The cannabis I can grow is more consistent than cannabis I can buy	38	48	21	38	35	50	29	53	42	55	15	42	25	23	42	46	28	36	34
I can flush the cannabis I grow to remove chemical residue	28	36	20	31	33	42	20	44	45	42	23	36	32	16	28	44	22	26	29
The cannabis I can grow is stronger than the cannabis I can buy	27	9	7	29	17	15	19	23	18	21	24	38	20	9	22	24	26	29	19
The cannabis I can grow is milder than the cannabis I can buy	8	27	28	6	15	24	13	15	12	15	4	8	9	23	6	23	8	5	14
Risk Reduction	54	82	59	68	54	73	71	75	68	74	26	60	77	35	66	71	65	61	64
To avoid contact with criminals or criminal networks	49	75	52	21	47	70	67	72	64	72	13	58	74	28	61	69	52	29	53
Growing is not as risky as buying	23	36	29	10	18	27	35	31	24	32	18	19	30	7	29	34	31	20	25
Because it is now legal / tolerated / decriminalized	4	2	8	59	7	<1	1	1	<1	2	3	6	2	8	1	0	43	39	13
Economic	58	68	66	75	67	66	54	70	65	61	33	63	61	69	64	69	45	67	63
Cheaper than buying cannabis	55	61	65	72	61	65	52	66	63	60	31	62	60	64	62	68	42	60	60
So I can sell it (to profit, beyond paying for my own drug use)	4	7	3	5	12	3	5	13	4	2	2	5	3	6	8	5	3	8	5
So I can sell it (to pay for my own cannabis use)	3	5	2	3	4	5	3	8	2	1	2	6	3	3	5	3	2	5	3
So I can sell it (to pay for other drug use)	1	2	<1	1	2	1	1	2	1	0	<1	2	<1	1	1	0	1	<1	1
Convenience	42	50	58	51	44	50	43	55	45	49	32	42	47	39	47	48	40	48	48
To see whether I could grow it	20	20	38	36	17	28	25	30	23	26	13	29	35	25	24	25	19	31	29
It is easier to grow than to buy	28	32	25	15	23	24	20	37	23	26	20	17	20	9	29	28	24	22	23
Because the plant is easy to take care of	16	25	19	22	18	18	18	19	14	16	7	14	15	16	13	18	9	17	17
Ideological	24	34	32	42	31	39	40	37	46	42	13	31	44	38	24	55	29	26	35
For political reasons	17	23	19	29	21	26	29	25	34	30	7	20	30	26	20	37	20	17	24
For ecological/environmental reasons	13	23	22	32	19	25	24	18	28	24	7	20	25	25	13	26	19	18	22
For fair trade reasons	5	7	13	13	14	16	19	17	22	27	<1	12	20	11	6	26	12	8	14
COVID-19 Related	17	11	19	17	10	15	12	10	14	17	11	17	30	8	12	32	7	14	17
Because I had / have more time at home (COVID-19)	7	7	13	13	5	8	5	7	7	11	9	13	14	6	4	18	6	10	10
Because cannabis is / was more expensive to buy (COVID-19)	11	5	5	4	4	5	7	4	9	6	4	7	20	3	7	22	2	6	8
Because cannabis is / was in short supply due (COVID-19)	10	9	6	3	6	7	5	4	7	7	3	6	20	1	6	26	2	4	7
Because it is / was difficult to physically get cannabis (COVID-19)	10	5	7	3	5	7	5	5	7	8	5	6	17	1	8	23	2	5	7
Total N	732	44	2104	519	281	800	880	535	690	341	215	86	1396	359	198	114	341	1821	11458

Note. Percentages do not sum to 100% because multiple responses were possible.

Table 10: Market participation

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
What did you do with the cannabis you grew in the last 12 months? (%)[a,b]	Consume for personal use	98	94	96	97	94	98	97	98	99	98	94	96	99	93	98	97	97	93	96
	Store / keep in your possession	38	50	50	50	42	39	36	42	39	33	58	46	33	48	46	45	39	48	43
	Give away or share	55	79	65	71	68	65	54	55	56	55	87	48	64	64	72	62	74	60	62
	Swap with other growers	12	15	13	19	12	14	7	22	13	9	19	12	16	8	23	14	21	10	13
	Sell (any reason)	*19*	*18*	*15*	*13*	*30*	*24*	*12*	*36*	*17*	*12*	*3*	*28*	*16*	*19*	*34*	*18*	*16*	*25*	*19*
	Sell to cover costs of growing	14	15	12	10	21	22	9	28	13	11	2	18	13	13	30	17	12	17	15
	Sell for profit	9	12	7	5	17	6	5	23	8	3	3	20	6	9	14	3	9	14	9
	Total N	450	34	1450	439	195	528	602	363	471	256	140	50	929	254	124	71	178	1361	7895
What percentage of total income came from cultivation activities?[c]	0-10%	51	33	58	52	27	52	61	35	47	43	75	57	69	40	50	50	50	26	43
	11-50%	37	67	30	19	50	30	25	46	25	43	0	29	16	15	36	50	33	24	30
	51-100%	11	0	11	29	23	18	14	19	28	14	25	14	16	45	14	0	17	50	27
	Total N	35	3	89	21	30	33	28	78	36	7	4	7	51	20	14	2	12	183	653
In the past 12 months, have you sold: (%)[b]	Cannabis not grown yourself	7	15	7	4	14	11	4	12	4	4	1	13	9	6	14	7	4	4	7
	Drugs other than cannabis	2	6	1	1	3	5	2	5	1	0	1	2	1	2	5	1	<1	1	2
	Total N	530	34	1559	454	203	555	632	412	515	285	144	64	1021	264	139	74	213	1514	8612

Notes. Percentages do not necessarily add to 100% due to rounding. This table only shows respondents who had grown cannabis in the last 12 months.

[a] Percentages do not add to 100% because multiple responses were possible.

[b] Excludes respondents who had not grown cannabis in the last 12 months.

[c] Excludes respondents who had not grown cannabis in the last 12 months or sold any of their crop in the last 12 months for profit.

Table 11: Police contact related to cannabis cultivation

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Estimated risk of getting caught by police for growing cannabis	None—grows legally	<1	2	2	73	8	1	1	1	<1	0	1	4	1	8	0	0	68	46	14
	Very low	18	22	38	16	22	14	34	18	9	22	10	24	4	32	19	22	8	21	21
	Low	29	12	30	5	28	29	33	38	16	35	10	25	9	23	31	23	13	16	23
	Moderate	30	37	22	3	28	35	25	32	29	29	30	34	27	24	32	26	8	12	23
	High	13	15	6	1	10	16	5	7	28	9	28	4	33	10	10	17	3	2	12
	Very high	9	12	2	1	4	6	2	4	17	5	20	7	26	3	8	11	1	2	7
	Total N	632	41	1850	488	250	729	755	493	625	310	162	67	1258	307	180	107	272	1640	10166
Ever come into contact with the police because of cannabis growing	No	77	77	92	93	75	85	90	72	87	84	90	81	91	85	77	100	92	90	88
	Yes	23	23	8	7	25	15	10	28	13	16	10	19	9	15	23	0	8	20	12
	Total N	656	43	1941	487	255	756	806	509	633	325	177	74	1270	330	187	111	277	1687	10524
Which of the following legal actions has ever happened to you because of your cannabis growing? [a]	Caught by police	74	67	56	43	49	69	74	69	70	69	82	73	39	57	88	0	33	43	61
	Informally warned	5	11	22	20	8	5	17	9	16	10	6	18	15	19	19	0	22	19	14
	Formally cautioned	8	11	15	6	9	2	14	6	5	29	0	18	17	26	14	0	11	7	11
	Given a ticket / infringement notice	13	22	30	3	62	23	57	19	28	6	6	9	15	19	2	0	11	10	22
	Arrested (taken into custody)	49	22	39	34	42	41	35	66	58	63	12	64	46	32	67	0	17	37	46
	Criminally charged	68	33	30	43	58	58	43	51	33	58	18	36	32	21	67	0	17	41	45
	Been issued a summons	37	56	12	14	17	34	6	11	10	40	6	27	12	17	23	0	17	11	18
	Been to court	67	44	31	37	35	58	38	68	63	60	24	36	23	38	67	0	11	45	48
	Been convicted	53	22	24	20	45	50	43	71	53	54	35	27	23	26	65	0	6	32	42
	Been imprisoned	11	0	10	9	18	13	21	11	5	15	29	27	15	6	12	0	0	21	13
	Asset seizure / confiscation	12	22	16	20	22	16	25	31	11	17	12	0	21	13	19	0	28	18	18
	Seizure / confiscation of drugs	53	67	45	43	49	63	47	76	74	65	12	64	59	38	63	0	17	25	53
	Seizure / confiscation of grow equip	32	22	43	34	43	47	40	79	52	50	6	45	33	40	37	0	11	20	42
	Acquitted	4	11	12	23	5	10	8	8	2	13	0	9	15	15	2	0	11	11	9
	Probation / community sentence	1	0	3	0	0	2	3	2	0	4	0	9	0	0	2	0	0	3	2
	Fine / fee	2	0	1	0	0	4	1	1	2	2	0	0	0	0	2	0	0	1	1
	Suspended sentence	1	0	3	0	2	1	0	1	1	2	0	0	0	0	0	0	0	0	1
	Civil penalty	0	0	0	0	0	2	0	1	2	0	0	0	0	0	2	0	0	1	1
	Inspected / investigated	1	11	1	11	0	1	3	0	2	2	0	0	3	4	2	0	0	13	3
	Police report filed	0	0	1	6	0	0	1	0	0	2	0	0	0	0	0	0	22	1	1
	Other action	3	0	7	9	9	6	0	1	4	6	0	0	4	6	2	0	11	8	5
	Total N	144	9	154	35	65	115	77	140	81	48	17	11	112	47	43	0	18	145	1276

Note: Percentages may not sum to 100% due to rounding.

[a] Excludes respondents who had never had contact with the police regarding their cannabis growing. Percentages do not add to 100% because multiple responses were possible.

Table 12: Criminal convictions and criminality beyond cultivation

		AUS	AUT	BEL	CAN	CHE	DEU	DNK	FIN	FRA	GBR	GEO	ISR	ITA	NLD	NZL	PRT	URY	USA	Total
Have you engaged in any non-drug related illegal activities in the past 12 months?	None	92	91	85	94	80	86	94	88	90	97	93	89	89	93	94	96	96	97	91
	Non-criminal offence	2	2	3	2	9	4	2	8	4	1	1	0	8	2	1	1	1	1	3
	Driving-related offence	6	7	11	3	11	9	3	6	6	<1	4	7	2	5	5	2	1	2	5
	Property offence	1	0	1	1	1	1	1	1	1	1	0	0	<1	<1	0	0	1	<1	1
	Violent offence	<1	0	<1	<1	1	<1	1	1	<1	<1	1	0	<1	0	0	0	0	<1	<1
	Public order offence	<1	0	1	0	1	<1	<1	<1	1	<1	0	3	<1	1	0	1	1	<1	1
	Other	<1	0	<1	<1	1	<1	<1	1	<1	<1	1	3	1	<1	1	0	1	<1	<1
	Total N	652	43	1909	486	246	742	791	505	632	325	164	72	1265	329	188	109	272	1675	10405
As an adult, have you ever been found guilty of any of the following offences?	Never been found guilty of an offence	43	71	54	68	37	61	46	35	46	56	65	56	76	68	49	75	95	50	56
	Cannabis possession/use	27	19	19	7	42	24	24	36	33	20	16	26	17	7	21	15	2	17	21
	Cannabis cultivation	14	7	3	1	13	8	6	24	8	10	7	4	3	6	16	0	1	3	6
	Cannabis supply	4	0	2	<1	7	2	4	4	4	3	0	3	3	3	4	1	<1	1	3
	Cannabis trafficking	2	2	2	2	9	2	2	2	3	<1	0	0	<1	3	0	1	<1	2	2
	Other drug-related offence	5	0	3	2	6	3	4	10	4	4	9	0	1	3	2	1	0	4	4
	Property offence	2	0	1	2	3	2	4	6	1	3	1	0	<1	3	3	1	<1	3	2
	Violent offence	3	5	1	1	2	2	3	7	2	4	1	0	<1	3	3	1	0	3	2
	Driving-related offence	15	7	8	6	14	7	9	15	13	6	4	6	2	6	11	7	<1	12	8
	Minor traffic violation	34	5	29	21	29	17	30	32	25	25	7	17	4	20	38	8	3	34	24
	Public order offence	1	0	<1	0	2	1	1	2	<1	1	1	0	<1	1	1	0	0	1	1
	Other	<1	0	<1	0	0	1	1	<1	0	0	0	1	<1	0	0	0	0	<1	<1
	Total N	653	42	1911	481	250	748	774	511	627	320	166	70	1253	318	185	109	273	1657	10348

Note. Percentages may not sum to 100% because multiple responses were possible.