



## Policy Analysis

## Overview of “home” cultivation policies and the case for community-based cannabis supply

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## ABSTRACT

**Background:** Cannabis policies should be relevant to communities most impacted by them. Home cultivation policies can engage people who grow cannabis and build on their motivation to supply a safe product. This paper aims to examine the laws pertaining to “home” (i.e. personal, small-scale) cannabis cultivation internationally and their different aspects, and to discuss the potential of these policies to be expanded into community-level cannabis supply models.

**Methods:** We reviewed relevant laws and regulations in states/countries that legalised, decriminalised or applied other non-prohibitive approaches to home cannabis cultivation.

**Findings:** Non-prohibitive approaches to home cannabis cultivation have been adopted in at least 27 jurisdictions. Twelve jurisdictions “de jure” legalised home cultivation (three U.S. states and Antigua and Barbuda legalised only home cultivation; six U.S. states, Uruguay and Canada legalised commercial sales as well). Eight states/countries “de facto” (Belgium, the Netherlands) or “de jure” decriminalised it (Czech Republic, Spain, Jamaica, and three Australian states). “De jure” depenalisation was in place in Chile and Brazil and recent court rulings yielded “de facto” depenalisation or “de facto” legalisation in five other jurisdictions (South Africa, Mexico, Colombia, Costa Rica and Georgia). Varying number of plants (per person and per property) and the circumstances of cultivation were in place. The key limitations of the regulations included (i) possession thresholds for the produce from home cultivations, (ii) rules about sharing the produce, and (iii) potentially disproportionate sanctions for non-authorised behaviours. Despite currently being limited, home cultivation policies might have the capacity to engage cannabis networks that already exist in the community and like that, enhance their participation in legitimate policy schemes.

**Conclusions:** Rules around pooled cultivation and sharing could be made fit for purpose to accommodate community supply of cannabis. Home cultivation policies could serve as a basis for community-level cannabis supply models and as such, for more inclusive cannabis policies.

## Introduction

Small-scale, non-commercial, home cultivation for (mainly) personal, non-medicinal use is now a wide-spread phenomenon globally. Whilst the research into “home cultivation” (term we use throughout this paper for the aforementioned behaviours) is limited, it suggests that between 1% and 10% of those who used cannabis in the past 12 months in countries that prohibit cannabis cultivation might also grow

it (Caulkins & Pacula, 2006; Trautmann, Kilmer, & Turnbull, 2013). Mirroring that, the majority of (small-scale) cannabis cultivators who participated in an international online survey consume the cannabis they grow (Potter et al., 2016). Cannabis users across the globe state that home cultivation helps them avoid buying cannabis via the illegal market, is less costly, and can yield higher cannabis quality than illegal market (Belackova, Brandnerova, & Vechet, 2018; Potter et al., 2016). However, home cultivation for other than medical purposes, i.e.

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recreational, remains prohibited in most countries. An overview of what are the non-prohibitive laws and regulations towards (non-medical) home cannabis cultivation is missing.

### *Home cultivation policies internationally*

Much political and public debate exists across the globe surrounding how to best legislate and regulate cannabis, in particular when it comes to cannabis for non-medical use. A variety of cannabis law reforms which allow for cannabis production, supply, possession, and consumption under schemes other than prohibition have been introduced internationally. The most visible has been the legalisation and regulation of cannabis supply in several states of the United States (U.S.) (Pardo, 2014), introduced as the next step after decriminalisation of recreational cannabis and adoption of medicinal cannabis policies at the state level (Stevens & Pacula, 2017). Although cannabis legalisation has been expanding across the U.S. states, there is little indication of other countries (e.g. in Europe) moving in the direction of regulated markets (Hughes, Quigley, Ballotta, & Griffiths, 2017). All countries are, in fact, bound to three United Nations (U.N.) drug control conventions (U.N., 1961, 1971, 1988) which obligate them to criminalise cannabis and other drug production, and to make cannabis possession in non-medical contexts a punishable offence (either penal or administrative).

A growing number of countries globally have decriminalised personal drug possession and home cultivation within the scope of the conventions (Eastwood, Fox, & Rosmarin, 2016). These law reforms have taken the form of “de jure” decriminalisation (e.g. removing criminal penalties from the law) of drug possession in Portugal or the Czech Republic and “de facto” decriminalisation (e.g. police guideline to non-enforce the criminal offence) in countries such as the Netherlands or Belgium (Belackova & Stefunkova, 2018; Decorte, 2008; Hughes & Stevens, 2012; Mravčík, 2015; Van Solinge, 1999). Decriminalisation of home cultivation appears to align with the U.N. treaties on similar lines as decriminalisation of personal possession, i.e. could be preceded with non-criminal sanctions (Jelsma, 2011). Decriminalisation of home cultivation has been described in the Netherlands, the Czech Republic (Belackova, Maalsté, Zabransky, & Grund, 2015), and Spain (Arana & Sánchez, 2011).

In the U.S., home cultivation has been allowed in states which, irrespective of the U.N. treaties, legalised and regulated cannabis supply via ballot initiatives (Borodovsky & Budney, 2017). Variation seems to exist in the way (home) cannabis cultivation is governed in jurisdictions which have legalised and regulated cannabis production. For example, there is a difference in the number of plants that a person or household is legally allowed to grow at any one time (Pardo, 2014). A comparison of the features of these laws and policies is warranted.

### *The role of home cultivation in cannabis policy reform*

In their overview of alternative cannabis policies, Kilmer and Pacula (2017) mention communal, own-grown suppliers and not for profit organisations, but without providing much detail on those options. On a scale of reforms, they place home cultivation it as the next step from prohibition. Rolles (2009) argues that in the context of a regulated cannabis market, home cultivation would become a minority activity for a small group of hobbyists rather than a viable model of cannabis supply. At the same time, home cultivation offers limited options for the authorities to regulate product content and availability, and yields low or no tax return (Borodovsky & Budney, 2017; Caulkins, Kilmer, MacCoun, Pacula, & Reuter, 2012). Unregulated potency can be of concern to policy makers - while some consumers prefer “mild” cannabis over “too strong”, overall, home growers or cannabis consumers seem less averse to producing excessively high- tetrahydrocannabinol cannabis than the potential regulators (Decorte, 2010). While experienced users probably can titrate cannabis dose based on the concentration of tetrahydrocannabinol (Freeman et al., 2014; Korf,

Benschop, & Wouters, 2007), higher potency has been linked with increased risk of dependence (Freeman & Winstock, 2015; Freeman et al., 2018).

Yet, discussion on non-commercial cannabis policy models has recently received new impulses (Decorte, 2018; Pacula, 2017; Rolles & Murkin, 2016; Wilkins, 2018). One of the reasons for increased interest in not-for-profit options is that the emerging commercial cannabis markets might contradict several policy aims that pertain to public health, similar to the tobacco industry in the past (Barry, Hilamo, & Glantz, 2014; Hall & Lynskey, 2016; Pacula, Kilmer, Wagenaar, Chaloupka, & Caulkins, 2014; Room, 2014; Subritzky, Lenton, & Pettigrew, 2016). In particular, there are problems with ensuring that licensed (commercial) growers follow cultivation procedures that result in a safe product free of pesticides and other contaminants (Russo, 2016; Stone, 2014; Subritzky, Pettigrew, & Lenton, 2017). It has been previously argued that people who cultivate cannabis for their personal use have an inherent incentive to make it as safe as possible (Belackova & Wilkins, 2018). Knowing “what they put in their bodies” has been an important motivation to cultivate cannabis, often despite the risk of elevated criminal sanctions when compared to buying it (Decorte, 2010; Potter, 2010). There are some gaps in determining safe cultivation techniques, e. g. potentially harmful chemicals not declared in commercially available fertilisers (Lenton, Frank, Barratt, Potter, & Decorte, 2018), but people who grow cannabis for their own use seem open to receive guidance from the regulators where appropriate (Lenton, Frank, Barratt, Dahl, & Potter, 2015).

The health-seeking behaviour of non-commercial growers can be extended to fellow users. An example of such extension are cannabis social clubs (CSC) that operate “pooled” cultivation, i.e. one person growing cannabis on behalf of several cannabis users (Barriuso, 2011; Belackova, Tomkova, & Zabransky, 2016; Decorte et al., 2017). Overall, engaging with home growers can decrease the risks of cannabis use in many ways, i.e. help to shape the risk environment (Rhodes, 2002). Small-scale growers are often embedded in the “cannabis culture” (Hammersvik, Sandberg, & Pedersen, 2012; Sandberg, 2012), and tend to have high social status among the consumers. This could put them at the centre of peer-delivered harm reduction practice, as described in the CSCs (Belackova & Wilkins, 2018).

Overall, people who use and grow cannabis are important stakeholders in drug policy making. Involving the communities most affected by drug policies is key when designing, planning, and implementing regulations, so that these are relevant to them (OSI, 2008). Giving them a voice in policy is not only important to inform its development, but may also build trust and increase legitimacy of what is being implemented (Lancaster, Ritter, & Stafford, 2013). As with other forms of community organizing, supply of cannabis can conceptually fall under “field of practice in which residents collaboratively investigate and take collective action regarding social issue of mutual concern” (Christens & Speer, 2015; Dille, Hitchcock, McGroder, Greto, & Richardson, 2017; Kilmer & Pacula, 2017). Cannabis growers, consumers and non-using community could design cannabis supply models that correspond to the need in the community and the current capacities for safe cannabis production. For instance, local-level governance could allow for pooled cultivation, for compensating growers for the cost of cultivation, and for restricting such supply to the members of the community.

This paper aimed to: (1) identify jurisdictions that adopted non-prohibitive approaches towards (non-medical) home cannabis cultivation; (2) review relevant laws and regulatory documents in those jurisdictions; (3) assess the main aspects and limitations of these laws and regulations; and (4) discuss the potential of home cultivation policies to be expanded into community-level cannabis supply policies.

### **Methods**

To identify the list of countries or states that decriminalised or legalised (non-medical) home cannabis cultivation, we reviewed

**Table 1**  
Overview of jurisdictions that introduced laws and policies legalising home cultivation.

	Threshold number of plants considered per person	Threshold number of mature plants	Limit on the number of plants per residence	Other circumstance of cannabis cultivation	Produce from plants authorised	Cannabis possession threshold (irrespective of origin)	Sharing / gifting / distribution	Laws / regulations
<b>LEGALISED de jure (home cultivation Only)</b>								
Antigua and Barbuda	4	–	–	On one's property.	–	15 g	– <sup>a</sup>	The Misuse of Drugs (Amendment) Act, 2018
Maine (U.S.)	12 immature and unlimited seedlings.	3	–	Not visible; tag with growers' details.	Yes, on the property where grown.	71 g	– <sup>a</sup>	Maine Revised Statutes, 2018 Title 28-B, Chapter 3: Adult Use of Marijuana (replaced 2016 Title 7, Chapter 417: Cannabis Legalisation Act)
Vermont (U.S.)	4	2	4 (2 mature)	21 years and older, own property or agreed by owner, not visible.	Yes, if indoor on the property and access restricted.	28 g (5 g hashish)	–	Act No. 86. An act relating to eliminating penalties for possession of limited amounts of marijuana by adults 21 years of age or older. (H.511)
Washington (U.S.)	6	3	12 (6 mature)	In one's residence.	Yes	57 g	1 ounce if over 21 y.	Initiative 71. District of Columbia Code Division VIII. General Laws. § 48-904.01. Prohibited Acts A; Penalties
<b>LEGALISED de jure (home cultivation alongside with other supply options)</b>								
Alaska (U.S.)	6	3	25 <sup>b</sup>	–	Yes	28 g (113 in private)	Up to 28 g gifted.	Alaska Statutes Title 17. Food and Drugs; Chapter 17.38 The Regulation of Cannabis
California (U.S.)	6	–	6	21 years and older for personal use at their residence. not visible.	Yes	28 g	Gift 28 g or less.	Adult Use of Cannabis Act (AUMA) (Proposition 64)
Colorado (U.S.)	6	3	–	21 years and older, not visible.	Yes	28 g	– <sup>a</sup>	Colo. Const. Art. XVIII, Section 16 Personal Use and Regulation of Cannabis
Nevada (U.S.)	6	–	12	Enclosed space, > 25 miles from dispensary, for personal use, possessed at home.	Yes	28 g	Gift up to 28 g.	2017 Nevada Revised Statutes Chapter 453D - Regulation and Taxation of Cannabis Act
Massachusetts (U.S.)	6	–	12	Personal use; in private residence.	Yes	283 g	– <sup>a</sup>	Massachusetts General Laws Part I. Administration of the Government (Ch. 1-182); Ch. 94 G Regulation of the Use and Distribution of Cannabis not Medically Prescribed
Oregon (U.S.)	4	–	4	–	Yes, up to 227 g	28 g	– <sup>a</sup>	Measure 91 (Control, Regulation, and Taxation of Cannabis and Industrial Hemp Act).
Canada	4	–	4	For personal use.	–	30 g	Share up to 30 g with adults.	The Cannabis Act (Bill C-45).
Uruguay	6	–	–	hHas to sign into a registry.	480 g per year	–	– <sup>a</sup>	Law No. 19172 on December 20, 2013.
<b>LEGALISED de facto</b>								
South Africa	In a private place for personal consumption in private.					–	– <sup>a</sup>	Constitutional Court Judgment 2018 (10) BCLR 1220 (CC) - sections 4(b) and 5(b) of Drugs and Drug Trafficking Act 140 of 1992 ruled unconstitutional.
Mexico	Personal use.					–	– <sup>a</sup>	Supreme Court of Justice of the Nation, Resolution 548/2018 and 547/2018.

– no / not specified.

<sup>a</sup> More serious offence.

<sup>b</sup> It has been argued that there's a constitutional right of all Alaskans based on the Ravin case to cultivate up to 25 cannabis plants if in private (Brandeis, 2015, Brandeis, 2012).

scientific literature, grey literature and media accounts that were available online in English and Spanish between April and December 2018 (last updated). A preliminary list of jurisdictions was consulted with representatives of ENCOD (European Coalition for Just and Effective Drug Policies) and FAAAT (For Alternative Approaches to Addiction, Think & do tank). This yielded a list of fifty-one jurisdictions. We subsequently retrieved the relevant laws and regulations and reviewed them in detail in order to assess whether non-prohibitive measures towards home cannabis cultivation were in place. When the information about laws was ambiguous, local experts were consulted.

Twenty-seven jurisdictions were shortlisted as having non-prohibitive measures towards cannabis cultivation and we categorised each based on the type of policy in place, building on typologies that were previously introduced in literature (EMCDDA, 2005, 2016; Hughes et al., 2017). As such, each jurisdiction was categorised as one of the following: “de jure” and “de facto” options for legalisation, decriminalisation, depenalisation and for legalisation policies (six policy categories in total). Legalisation included laws where there was absence of any sanctions pertaining to home cultivation (see Table 1). Decriminalisation included laws where administrative sanctions for home cultivation were in place (see Table 2) and depenalisation included laws where home cultivation remained a criminal offence but not custodial sanctions (see Table 3). “De jure” policies were those where the sanctions were specified by the law, “de facto” policies were all other mechanisms (e.g. guideline or a court decision annulling existing laws). Classifying court decisions posed challenges. Those that were seen as Supreme Court decision (i.e. instructing other courts not to prosecute a crime) were classified as “de facto” depenalisation. Those that were Constitutional Court decisions (i.e. annulled a particular criminal provision) were considered as “de facto” legalisation (see Table 1).

Further on, we examined the specific features of the home cultivation laws and policies (number of non-prohibited plants, approaches to sharing-gifting and quantity of cannabis allowed for personal possession after harvest). Lastly, we drew on existing literature in discussing the role home cultivation could play in community-level cannabis policies.

## Findings

Overall, we identified 27 jurisdictions which had non-prohibitive measures towards (non-medicinal) home cannabis cultivation in place. There were substantial differences between the type of laws and regulations (ranging from absence of prohibition to prescriptive regulations) as well as between the different aspects of these regulations. The different aspects included threshold number of plants, limiting the number of plants per residence and circumstances of cultivation. The limitations of these laws appeared to be (sometimes) unclear thresholds for possessing produce of the cultivation, personal use only vs. gifting of small amounts, and potentially disproportional penalties for non-authorised behaviours. The main features and limitations of the said laws and regulations are summarized below.

### Legalisation of homecannabis cultivation

Legalisation of small-scale (non-medicinal) cannabis cultivation was in place in twelve states / countries (see Table 1). These were Canada, Uruguay, Antigua and Barbuda, and nine U.S. states. Among them, three U.S. states (Maine, Vermont, Washington D.C.) and Antigua and Barbuda legalised home cultivation only (no dispensaries or commercial sales were in place at the time of this analysis). Canada, Uruguay, and the remaining six U.S. states (Alaska, California, Colorado, Massachusetts, Nevada, and Oregon) had legalised home cultivation as well as commercial retail outlets (in the U.S., these are referred to as dispensaries, whereas in Uruguay they are pharmacies). One U.S. state (Washington) legalised a commercial market with cannabis, but not personal cultivation.

In Canada, a complex legislation for cannabis regulation came into effect in October 2018 which legalised cannabis production and supply by licensed providers and home cultivation from authorised cannabis seeds. Individual provinces can further restrict these. In Uruguay, personal cannabis cultivation was indeed part of the broader legislation to legalise and regulate cannabis. Home growers had to sign into a registry maintained by the Institute for the Regulation and Control of Cannabis (IRCCA).

Almost uniformly, the threshold number of cannabis plants for home cultivation in the jurisdictions that legalised it were six ( $n = 6$ ), except for Canada and the states of Oregon and Vermont which adopted a limit of four plants and for Maine which allowed for up to 12 plants. Yet, in Alaska, Colorado, and Washington D.C. only three plants of the six were allowed to be mature at a time (same as three of the twelve in Maine and two of the four in Vermont). In addition, a previous assessment of Alaskan constitutional rights suggests that up to 25 plants could be cultivated if in private (Brandeis, 2012, 2015).

Some legislations required an age-threshold limit for when home cultivation was allowed (e.g. 21 years in California, Colorado or Vermont). Other restrictions included that the plants should not be visible to the public and/or were maintained in an enclosed space (Maine, California, Colorado, Nevada, Vermont) or that the produce should be possessed in the residence (California, Massachusetts, Nevada). Some jurisdictions limited the overall number of plants per individual also per residence (Vermont, California, Oregon, Canada) or stated that a maximum of twice the number allowed per individual were allowed per residence (Massachusetts, Nevada, Washington D.C.). Maine required each plant to be tagged with growers identifying details. In Nevada, home cultivation was legal only if residing > 25 miles from the nearest dispensary.

Two jurisdictions introduced court rulings that we classified as de facto legalisation (annulment of prohibitive laws towards home cannabis cultivation), as no specific laws legalising home cannabis cultivation have been in place. In South Africa, a recent court ruling declared that it was unconstitutional for any part of the law to criminalize cannabis use, possession, cultivation or purchase “in a private place for personal consumption in private”. A similar ruling was passed in Mexico. The court rulings pertained to personal cannabis cultivation, not specifying quantities.

### Decriminalisation of home cannabis cultivation

Under decriminalization policies, home cannabis cultivation was an administrative offence (rather than a criminal one) in eight states / countries: four European countries (Belgium, Czech Republic, Spain and the Netherlands), three Australian states - South Australia, Australian Capital Territory (ACT), and Northern Territory, and Jamaica (see Table 2). In Belgium and the Netherlands, this was a “de facto” rather than “de jure” policy, meaning that despite being a crime by the law, police were instructed to not enforce it under certain circumstances or to not enforce it at all. In Belgium, criminal enforcement of home cultivation had “low priority” if no aggravated circumstances were present.

In other states / countries, decriminalisation made part of the drug law (“de jure”); this was the case of the Czech Republic, Spain, Jamaica and three Australian states. In the Australian states, decriminalisation was though “at police discretion”, meaning that the police could still decide to press a criminal charge. Also, if the offender failed to pay a fine within a certain timeframe, criminal offence would apply.

Between different jurisdictions that decriminalised home cannabis cultivation, the number of plants that were considered ranged between one or two ( $n = 4$ ) and five ( $n = 3$ ). In Spain, federal decriminalisation of cannabis cultivation applied to “private space” and the number of plants was not specified. This has been extended into the operation of cannabis social clubs (combined with a “de facto” depenalisation of drug sharing among fellow consumers). In the ACT and the Czech

**Table 2**  
Overview of jurisdictions that introduced laws and policies decriminalising home cultivation.

	Threshold number of plants considered per person	Cannabis possession threshold (irrespective of origin)	Produce from plants authorised	Sharing / gifting / distribution	Laws / regulations
<b>DECRIMINALISED de facto</b>					
Belgium	1	3 g	–	– <sup>a</sup>	1921 Law on Narcotic Drugs; 2003 and 2005 Ministerial Guidelines
The Netherlands	5	5 g	–	–	Opium Act; Directive for the Prosecution of Opium Act Offences
South Australia (AU) <sup>b</sup>	1	100 g	–	– <sup>a</sup>	South Australia's Controlled Substances Act 1984; 45A—Expiati 20 g
Australian Capital Territory (AU) <sup>c</sup>	2	50 g	–	– <sup>a</sup>	Drugs of Dependence (Amendment) No. 52, 1992; Criminal Code (Serious Drug Offences) Amendment Act 2004; Simple Cannabis Offence Notice (SCON)
Northern Territory (AU) <sup>d</sup>	2	50 g	–	– <sup>a</sup>	Misuse of Drugs Amendment Act 1996 (Act No. 4, 1996)
Czech Republic	5 for personal use.	10 g	–	– <sup>a</sup>	Section 39 of the Act No. 167/1998 Coll., on Addictive Substances (administrative offence); Section 285 and 284 of the Act No. 40/2009 Coll., Penal Code (criminal offence).
Jamaica	5 or unlimited for religion.	57 g	–	– <sup>a</sup>	The Dangerous Drugs (Amendment) Act 2015
Spain <sup>e</sup>	Not limited, fine if not in private.	100 g if in public	–	tolerated	Organic Law 4/2015 on the Protection of Public Security; Article 368 of the Criminal Code; Supreme Court's Interpretation- 'closed-circle' doctrine

– no / not specified.

<sup>a</sup> More serious offence.

<sup>b</sup> Police has the discretion to issue an on the spot fine or Cannabis Expiation Notice or charge with a criminal offence if not grown hydroponically; if a fine is not paid within 28 days, might be convicted of a "simple (criminal) cannabis offence".

<sup>c</sup> Police has the discretion to apply offence notice or charge with a criminal offence if for personal use and not grown artificially (hydroponically); if a fine for an offence notice is paid within 60 days, will be convicted of a "simple (criminal) cannabis offence".

<sup>d</sup> Police has the discretion to issue an infringement notice; if fine not paid within 28 days, further action may be pursued (e.g. community service or imprisonment).

<sup>e</sup> A law that was passed in Catalonia such that 150 kg/year per CSC, distributed among the members (Law 13/2017, 6 July 2017, about associations of cannabis consumers; Bulletin of the State no. 187, Sec I, page 77688) was deemed unconstitutional by the Spanish federal court; CSC – cannabis social clubs.

**Table 3**  
Overview of jurisdictions that introduced laws and policies depenalising home cannabis cultivation.

	Threshold number of plants considered per person	Cannabis possession threshold (irrespective of origin)	Produce from plants authorised	Sharing / gifting / distribution	Laws / regulations
<b>DEPENALISED de jure<sup>b</sup></b>	Brazil Chile	For personal use, determined by a judge. Personal use in short term.	- -	- <sup>a</sup> -	Law No. 11,343 of August 23, 2006 Law No. 20,000 that replaces Law No. 19,366 Penalising Illicit Trafficking of Narcotic Drugs and Psychotropic Substances
<b>DEPENALISED de facto<sup>c</sup></b>	Colombia Costa Rica Georgia <sup>d</sup>	20 g For personal use. <sup>1</sup> 70 g	- - -	- <sup>a</sup> - <sup>a</sup> -	Art. 375 of Penal Code, Supreme Court Resolution No. 44892 / Act. No. 212 Resolution No. 00481 – 2018 of the Third Chamber (Penal) of the Supreme Court Constitutional Court's decision no 701,722,725 on the case Citizens of Georgia Jambul Gvianidze, David Khomeriki and Lasha Gagishvili vs. the Parliament of Georgia, July 14, 2017

- no / not specified.

<sup>a</sup> More serious offence.<sup>b</sup> Criminal penalties should be dismissed by a judge according to the law.<sup>c</sup> Criminal penalties should / can be dismissed by a judge according to Supreme Court rulings (providing guidance to other courts such that home cannabis cultivation shouldn't be prosecuted as a crime).<sup>d</sup> Custodial sentence ("deprivation of liberty") deemed as unconstitutional (Human Rights Watch, 2018).

Republic, the set number of plants was further limited to personal use.

#### Depenalisation of home cannabis cultivation

Seven other jurisdictions adopted non-prohibitive approaches (see Table 3). Two countries – Brazil and Chile – “de jure” depenalised cannabis cultivation for personal use (i.e. cannabis cultivation remained a criminal offence, but the law indicated that the judge should apply non-custodial sentences). Similarly, in Colombia and Costa Rica, Supreme Court rulings instructed other courts that the criminal cases against home cultivation should not be pursued (we refer to this as “de facto” depenalisation). In Georgia, Constitutional Courts said it was unconstitutional to apply a custodial sentence for cannabis cultivation. In Colombia and in Georgia, thresholds limits of 20 plants and 151 g (of plants) respectively were given in those court decisions.

#### The limitations of home cultivation policies

While the laws described above provided a clear framework for home cannabis cultivation, we identified several potential caveats and limitations pertaining to their interpretation.

#### Thresholds on the produce from home cultivation

Eight of the nine U.S. states that legalised home cultivation, authorised the possession of all home cultivation produce (see Table 1). Two jurisdictions adopted specific thresholds for cannabis produce – up to 8 oz (approx. 230 g) in Oregon and up to 480 g in Uruguay. In the remaining jurisdictions, threshold quantities for home cultivation produce were missing which could create problems with law enforcement when the cannabis produce was no longer in the form of plants, but already in the form of dried herbal cannabis. In that instance, police might assess the produce based on the general personal cannabis possession threshold limits. However, ranging between 3 and 50 g (South Australia's 100 g being an outlier), cannabis possession threshold limits identified in our analysis seemed too low to encompass for the produce from the stated number of plants in most jurisdictions.

#### Personal use only vs. sharing of the produce

Several jurisdictions explicitly authorised “gifting”, i.e. the act of giving a certain amount of cannabis from own produce to another person without monetary exchange (Alaska, California, Nevada, Washington D.C. and Canada). In other places though, home cultivation was only allowed for personal use (California, Massachusetts, Nevada, Canada, ACT, Czech Republic, Brazil, Chile, South Africa and Mexico). This suggests that there exists variation in terms of which behaviours were authorised under home cultivation policies (private consumption only or non-commercial sharing of the produce). In addition, in California, Nevada and Canada, the laws were inconsistent in that they stated home cultivation was limited to personal use, but gifting was authorised as well. In three jurisdictions, gifting wasn't authorised, but home cannabis cultivations wasn't explicitly restricted to personal use either (Jamaica, Belgium, South Africa), leaving the boundaries of non-prohibitive behaviours unclear.

#### Disproportionate penalties for non-authorised behaviours

We found several instances when behaviours related to (otherwise not criminalised) home cultivation could yield disproportionately large penalties. First, we give an example of the Czech Republic. While cultivating up to 5 cannabis plants was an administrative offence, there was no threshold set up for the produce of this cultivation. Generally, possession of more than 10 g of cannabis was a criminal offence with up to 1 year prison sentence. Also, while personal possession of a “small amount” of any drug was an administrative offence there (Belackova & Stefunkova, 2018; Mravčík, 2015), other kinds of drug handling, including (any) drug sharing, were penalised equally as drug manufacture and trafficking with up to 5 years prison sentence (and higher if

committed in a large extent). In the instance of cannabis “gifting”, the court might regard to the circumstances of the crime (e.g. no profit made and low social risk) when determining the sentence, but this would unlikely result in an acquittal from the criminal charge.

Another example of disproportionate penalties pertained to overstepping the threshold number of plants in certain jurisdictions that legalised home cannabis cultivation. In Canada, administrative offences applied if the threshold number of plants exceeded “small quantities” and imprisonment for up to 14 years was in place if exceeded in large quantities (Department of Justice, 2018). While some U.S. states imposed administrative fines when circumstances of home cultivation were violated (e.g. up to 250 USD in Massachusetts for growing up the aforementioned six plants, yet in public sight), none of these jurisdictions seemed to impose administrative fines for overstepping the threshold number of plants – these were treated as misdemeanours (minor criminal offences) at the minimum. Three of the U.S. states that legalised home cultivation imposed a felony offence for when the number of plants exceeded the limit. For instance, in Oregon where cultivating up to six plants was legal, six to eight plants was a misdemeanour and the penalty was up to six months imprisonment, while more than eight cannabis plants was a felony with up to five years imprisonment (similar to cultivating more than 25 plants in Alaska). In Uruguay the minimum prison sentence for exceeding the number of plants was 20 months, and in Jamaica, the maximum sentence was three years of in prison (Table 4).

**Discussion**

Personal cannabis cultivation has now been approached in a non-prohibitive way in at least 27 jurisdictions globally. Among these, the main types of regulations included: whether home cultivation was legalised as the only supply option (three U.S. states and Antigua and Barbuda) or alongside other supply options (six U.S. states, Uruguay and Canada); decriminalised “de jure” (Czech Republic, Jamaica, Spain, and three Australian states, namely South Australia, Australian Capital Territory, and Northern Territory) or “de facto” (Belgium and the Netherlands); and “de jure” depenalised (Brazil, Chile). Also, due to Supreme or Constitutional Court decisions, in several jurisdictions home cultivation was “de facto” legalised (South Africa, Mexico) or “de facto” depenalised (Colombia, Costa Rica, Georgia).

*Uncertain legal situations*

First and foremost, these legislative options were not of equal significance. Among them, only (“de jure”) legalisation set home cultivation free of criminal charges, if within the threshold number of plants. Decriminalisation, depenalisation and all “de facto” provisions decreased the chance of criminal prosecution compared to prohibition. However, these policies were generally accompanied by monetary fines (decriminalisation), prolonged criminal proceedings or non-custodial punishments (depenalisation), and the risk of the plants being seized by the police prevailed. Where the Supreme Courts instructed not to prosecute home cultivation crimes, police could still press charges. In case of Constitutional courts decisions which annulated the respective sections of the law, further legislation was needed to clarify the situation.

Also, non-prohibitive laws and regulations reviewed in this paper often carried the risk of discordant legislative approaches from the different levels of government and law enforcement institutions. For instance, there has been an (ongoing) ambiguity between the U.S. federal laws forbidding cannabis supply and the state laws regulating medicinal and recreational cannabis use (Hawken, Caulkins, Kilmer, & Kleiman, 2013; Kleiman, 2013; Mikos, 2009; Pacula, Chriqui, Reichmann, & Terry-McElrath, 2002). In Spain, one of the first cannabis social clubs, Pannagh, was, against all legal interpretations, raided by the municipal police and the members were charged with drug trafficking; the criminal proceedings were later on dismissed by the

**Table 4**  
Offence classification for exceeding the number of cannabis plants legalised for home cultivation.

		Administrative offence	Criminal offence	Years of imprisonment when overstepping the threshold no. of plants (if not stated otherwise)	Fine	Law / Regulations
<b>Jamaica</b>		-	Yes	Up to 3 – 35y.	1.5 – 3 USD per ounce	The Dangerous Drugs (Amendment) Act 2015
<b>United States</b>	Alaska	-	Yes	Up to 5y (felony) if more than 25 plants.	1000 USD	Alaska Statute Sec. 11.71.040, 12.55.125, 12.55.035
	California <sup>a</sup>	-	Yes	Up to 6 m (misdemeanour).	not stated	2011 California Code Health and Safety, Section 11.358
	Colorado	-	Yes	6 m-2y (felony).	1000 – 10 000 USD	Health and Safety Code, Uniform Controlled Substances Act (11,000 – 11,651)
	Maine	-	Yes	Up to 1y.	2000 USD	Maine Criminal Code, Title 17, Chapter 45: Drugs
	Massachusetts <sup>b</sup>	-	Yes	Up to 2.5y.	5000-1000 USD	Controlled Substance Act, Chapter 94C, Section 32C
	Nevada	-	Yes	1-4y.	5000 USD	Nevada Revised Statutes 453.3393, 193.130
	Oregon	-	Yes	Up to 6 m (misdem) if less than 8 plants, or 5y (felony) if more than 8 plants.	2500 USD	Oregon Revised Statutes, 475.856, 153.005
	Vermont	-	Yes	Up to 6 m if first offense and eligible for drug court, 2 y if less than 4 mature plants, 3y if less than 6, 5y if less than 12 and up to 12y if more than 12.	2000 USD (up to 500 000 USD if 12 and more plants)	Act No. 86. An act relating to eliminating penalties for possession of limited amounts of marijuana by adults 21 years of age or older. (H.511)
	Washington D.C.	-	Yes	Up to 180 days if less than 14 g and first time offence; up to 5y otherwise.	1000 – 12 500 USD	Initiative 71. District of Columbia Code Division VIII. General Laws. § 48-904.01. Prohibited Acts A; Penalties; § 22-3571.01. Fines for criminal offenses
<b>Canada</b>		YES	Yes	Ticket for „small amount“ / up to 14y.	not stated	The Cannabis Act (Bill C-45)
<b>Uruguay</b>		-	Yes	20 m to 10y.	not stated	Law No. 19.172 replacing article 30 of the Law No 14.294

<sup>a</sup> Up to 250 USD fine when conditions for cultivating six plants are violated (e.g. visible to the public).

<sup>b</sup> Up to 100 USD fine when conditions for cultivating up to twelve plants if the person is younger than 21 and older than 18 years of age.

Biscay Provincial Court (Diana, 2015). Yet, two additional Supreme court rulings sentenced them to prison (Seshata, 2017), classifying the consistent supply of cannabis among CSC members as organised crime (EMCDDA, 2017). This seemed to challenge the basis on which CSCs have been considered as non-criminal in the past. Most recently, the federal Constitutional court ruled that any regulations of cannabis provision are unconstitutional in Spain (Barriuso, 2018). This would likely prevent local level authorities from adopting any prescriptive CSC regulations, notably, the full CSC legalisation that was approved by Catalanian parliament in 2017 (Baynes, 2017).

In the Czech Republic, different law enforcement authorities interpret the law in different ways. The administrative offence of small-scale cannabis cultivation for personal use could fulfil the characteristics of criminal offence of drug manufacturing once the crop is harvested. This is because the Czech Supreme Court issued a statement that between personal cultivation and possession of the crops, drug manufacturing takes place (Zeman, 2015). When the plants have finally dried, their possession (for personal use) might be classified as an administrative offence again. However, if the produce exceeded “greater than small amount”, set up as 10 g of cannabis (see the previous section), it would be punishable by imprisonment up to one year. Thus, if the police detected cannabis cultivation before harvest, decriminalisation would apply, but from the moment the plants are being dried, a court could prosecute it as a crime (Stefunkova, 2015).

#### *Clarifying the boundaries of home cultivation*

The different aspects and limitations of the legislations reviewed in this paper included the number of cannabis plants, possession of the produce and its sharing. Jurisdictions that legalised cannabis cultivation adopted more complex approaches to addressing these when they almost uniformly stated that the proceed from the authorised number of plants was legal to possess and sometimes stated that growers could share a part of their crops with (other) adults, but not sell it. Of note, several jurisdictions that legalised home cultivation have also set up a maximum number of plants per residence, preventing pooled cultivation to take place. It was unclear, however, how the boundaries of these rules were interpreted in practice.

For instance, it has been pointed out that the yield per cannabis plant is highly variable (Janatová et al., 2018; Vanhove, Surmont, Van Damme, & De Ruyver, 2012). Therefore, it was not perfectly clear how the authorities would decide whether the cannabis found of the property was a justifiable produce from the authorised number of plants or not. Our research did not identify any further regulations there.

Further on, a recent guidance on not-for-profit cannabis supply models has included home cultivation as a policy option when strictly for personal use (Decorte, 2018). However, gifting among cannabis users seems common (Belackova et al., 2018; Coomber et al., 2018). In an international survey of cannabis cultivators, 71% of people who grew cannabis said that they shared or gifted part of their produce, as opposed to 29% who sold some of it to cover the cost of cultivation or for profit (Potter et al., 2016). However, tolerance to this practice and the non-prohibition of cannabis sharing has contributed to evolvment of quasi-market or community supply practices in some jurisdictions. In the Netherlands, the non-enforcement policy applied to possession and retail sales of less than 5 g of cannabis has contributed to the evolution of retail outlets known as coffee shops (MacCoun, 2011). In Washington D.C. where home cultivation has been decriminalised alongside with “gifting”, commercial entrepreneurs have set off to offer cannabis products as a free gift together with otherwise overpriced products (Martell, 2018). In Spain, there had been legal precedents in which sharing drugs between fellow users was not considered as criminal supply. This led to an interpretation of the Penal Code such that allowed for sharing the crops of cannabis cultivation among habitual users, when in private (Muñoz & Soto, 2001), on the basis of which the existing practices in pooled cannabis cultivation and sharing of the

produce were formalised as the CSCs (Arana & Sánchez, 2011; Barriuso, 2011). It is yet to be seen how the recent court decisions described above will impact the CSC practice.

The rationale for limiting home cultivation to personal use by an individual in most decriminalisation and depenalisation policies could be adherence to the U.N. treaties where only personal possession and use can be treated non-criminally (Jelsma, 2011). In the context of cannabis legalisation, which has been implemented irrespective of the treaties, these restrictions seem aimed rather at preventing a large, untaxed market taking place (Jensen & Roussel, 2016). This suggests that in legalising home cultivation, rules about pooling the cultivation and sharing the produce could be made fit for purpose of a particular policy.

#### *Caveats of cannabis regulation and the role of home cannabis cultivation*

Our analysis shows that criminal penalties can apply to home growers who exceed the growing limit. These would also apply to when they sell some of their produce. Selling any produce from non-licensed origin continues being referred to as “black market”, despite legalisation (see e.g. Kilmer, 2014). In fact, re-conceptualisation of cannabis from “illegal” and “stigmatised” to “regulated” seems limited to cannabis originating from licensed producers. For instance, re-selling cannabis from a pharmacy or a cannabis social club in the Uruguayan context has been referred to as “grey role of market” (Boidi, Queirolo, & Cruz, 2016; Cerdá & Kilmer, 2017). Also, a paper previously published by Pardo (2014) found that licensed cannabis producers are generally sanctioned by fines and/or license revocations, rather than criminal sanctions. The recent Canadian legislation indeed sets up fines for organisations, but individual growers could undergo criminal prosecution (Minister of Justice, 2018). It seems that disproportionate stigma and criminal risks can apply to people who cultivate cannabis when compared to licensed commercial producers.

Anecdotally, un-official (black) market with cannabis persists in the U.S. states that legalised and regulated cannabis sales. Media reports suggest the reasons are high taxation and the consequent high prices, tight regulations and product controls, leaking production into non-legalised states and consumers maintaining relationships with their suppliers from pre-legalisation (Kaskey, 2018; Stewart, 2018; Yakowicz, 2018). With respect to the last point - research on the so-called social supply suggests that cannabis supply networks can involve a range of social motivations and bonds, rather than profit (Coomber, Moyle, & South, 2015, 2018; Lenton, Grigg, Scott, & Barratt, 2016). As such, consumers might have little incentive to cease procuring cannabis from established sources and start getting it from the rather expensive retail stores.

Community-level cannabis supply models might have the capacity to engage the pre-existing networks and include them in legitimate policy schemes. Authorising pooled cultivation and sharing the costs would be one approach. Another way might be exploring rules around the so-called “minimally commercial supply” which involves monetary exchange but can be distinguished from “dealing proper” (Coomber & Moyle, 2014).

#### *Inclusive cannabis policies and the case for community supply*

A recent commentary from Canada discussing the failure of current drug policy to aid indigenous people has stated: “the Government has made no commitment to tandem initiatives that address the issues of reparation for those who have been most heavily targeted under cannabis prohibition” (Valleriani, Lavalley, & McNeil, 2018). Others have argued that oligopoly-like market structures (i.e. limited number of producers and/or sellers) are unlikely to encompass for the variety of behaviours on cannabis markets and are deemed to non-adherence (Gettman & Kennedy, 2014). Overall, rather than building tightly regulated models with restricted access to both producers and

consumers (Rehm & Fischer, 2015), cannabis policies could aim for high participation in legitimate and more inclusive supply models.

Tight regulations of the commercial cannabis markets might offer reassurance to the public that cannabis is “under control”. Licensing a limited number of cannabis market players in combination with high taxes, age limits, or restrictions to advertising and retail is seen as an effective strategy to discourage cannabis use (Pacula et al., 2014). On the top of it, taxes can arguably cover any cost associated with negative externalities of cannabis and other drug use (e.g. treatment, roadside testing, etc.). An alternative approach could compensate for the tax revenue by replacing most or all cannabis-supply crimes by (revenue-generating) administrative fines, such as is the case with licensed suppliers. This could also yield reduction in cost of law enforcement (Miron & Zwiebel, 1995). Community-level policies would need to deploy measures of social control and formal or informal enforcement of norms with respect to access to minors, identification of mental health risks, or driving under the influence of cannabis. Working hand in hand with the growers and consumers would be essential, as examples from other drug use suggest that consumers have played important roles in initiating harm reduction measures (Clark, Wilder, & Winstanley, 2014; Friedman et al., 2007; Madden & Wodak, 2014).

While community-level governance seems to resemble the Canadian model in terms of provinces being able to tailor their cannabis policies, we argue for a reversed approach. In Canada, the provinces can tighten the supply models, but not loosen it up. Similarly, a recent research from Washington (state) has pointed out that its counties have been able to opt-out from the state-wide legalization and licensed market (Dilley et al., 2017), but not to design their own. In line with that, the recent cannabis legalization in Canada has practically banned medicinal cannabis dispensaries which until recently operated on compassionate, community basis (Capler & Lucas, 2006; Capler et al., 2017; Penn, 2014). Hence, tightly regulated cannabis legalisation policies are at risk of throwing out “the baby with the bathwater” or, in other words, dismissing the community of home-growers together with the prohibition.

## Conclusions

With the proliferation of cannabis policy reforms internationally, as of December 2018, personal cannabis cultivation has been legalised, decriminalised or depenalised (de facto or de jure) in at least 27 jurisdictions. A variety of aspects should be taken into consideration when regulating home cultivation (namely number of plants per person and per property, limitation to personal use and/or rules about sharing cannabis).

The level of legal re-assurance to people who grow their cannabis varied between these policies, and a risk of discordant interpretation on different levels of law enforcement was documented in several jurisdictions. Despite currently being limited, home cultivation policies might have the capacity to engage cannabis networks that already exist in the community and could enhance their participation in legitimate policy schemes. Home cultivation in itself incorporates inherent safe cultivation practices, but currently, home cultivators seem at a disproportionate risk of criminal sanctions when they slip.

Extension of home cultivation policies could make a cornerstone to more inclusive, community-level models of cannabis supply. The variability in non-prohibitive laws and regulations of home cannabis cultivation in terms of how they approach cultivating cannabis for personal use only vs. gifting some of the produce or pooling cultivation across consumers suggests that these provision could be made fit for purpose of particular policies, such as those involving community-level cannabis supply.

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The authors declare no conflict of interest.

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## Author contributions

VB designed the analysis. VB, MR(S) and KVD contributed to the analysis. All authors revised the manuscript and reviewed its final version.

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