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THE WORLD DRUG REPORT 2020:
PERSPECTIVES ON MARKETS, TECHNOLOGY, AND POLICY

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Key points

- The 2020 *World Drug Report* provides a comprehensive and sophisticated analysis of the current state of global drug markets, as their size, complexity and intricacy continue to grow. However, the Report can be criticised for turning a blind eye on the negative consequences of states' drug control efforts, and for overestimating the success of law enforcement approaches. To explore these shortcomings, this critique analyses the Report's approach to the key topic of technological innovation in drug policy, through a close reading of its sections on cryptomarkets, and on the eradication of crops destined for the illegal drug market in Colombia.

The 2020 World Drug Report on cryptomarkets

- While the Report includes for the first time substantive discussion of the growing role of darknet markets in the illegal drug economy, the United Nations Office on Drugs and Crime (UNODC or Office)'s analysis includes some gaps and mischaracterisations. These comprise a disproportionate focus on postal markets prevalent in Western countries, a reliance on outdated technological references and data, and a tendency to exaggerate the impact of law enforcement interventions.
- Crucially, the Report also fails to present some of the positive aspects of the emergence of cryptomarkets documented in existing literature, from the increased availability of harm reduction information at the point of sale, to the removal of physical meetings between end buyers and sellers, which in turn reduces the likelihood of violence.
- Considered together, the shortcomings in research and questionable interpretations point to an inclination to overestimate the success of approaches based on law enforcement and market closure in countering the growth of cryptomarkets. Alternative approaches based on market management are excluded from the analysis, thus providing policymakers with an unbalanced description of the available policy tools.

The 2020 World Drug Report on aerial crop eradication

- For years, technologies old and new have played a key role in efforts to curb coca cultivation in Colombia. The Colombian authorities recently announced the resumption of aerial spraying of crops destined for the illegal drug market, including the use of low-flying drones. This was the case despite concerns regarding the potential harms of aerial spraying for the health of growing communities and for the environment. The analysis of this situation in the 2020 World Drug Report is, again, somewhat unbalanced, and reductive. Problematically, the Report's analysis of crop eradication in Colombia does not mention the human rights and environmental concerns associated with this practice.
- This blind spot is exacerbated by the UNODC's failure to consider alternative policies that have been shown to be more effective at crop substitution than forced eradication. Chief amongst these alternatives is the voluntary substitution programme introduced by the Colombia Peace agreement, which – while not without its problems – has failed

due to the government's own refusal to provide adequate compensation and support to growers that joined the scheme.

- The Report also fails to acknowledge that, while the government of Colombia stopped aerial spraying of glyphosate – a substance identified as cancerogenic by the World Health Organization (WHO) – in May 2015, it has in fact continued to use glyphosate through 'fogging' by ground-based operators, a harmful method for coca-growing communities, including indigenous peoples.
- In this context, and under increasing pressure from the USA, the Colombian government recently announced the resumption of aerial spraying through drones, presumably because it is hoped that their capacity to fly at low heights will provide aerial fumigation with the precision it previously lacked. For obvious reasons, machines are also expected to be more effective than humans in the business of eradicating crops. However, this attempted 'technological fix' to the problems of eradication, and the ensuing controversy, are entirely missing from the 2020 World Drug Report.
- The announced resumption of aerial spraying points to a new era in drug law enforcement, where technology is used to conduct 'remote warfare' operations, from the use of surveillance drones to find crops deemed illegal and identify drug trafficking routes, to the deployment of weaponised drones to conduct individual attacks similar to those carried out in the so-called 'war on terror'. However, the proven capacity of actors in the illegal economy to counter and fend off these developments with innovations of their own indicates that new technologies are unlikely to provide law enforcement with the decisive advantage it has been seeking since the beginning of the 'war on drugs'.

Introduction

The product, as always, of a year's hard work, the *2020 World Drug Report* was launched in Vienna three months into the COVID-19 crisis and presented to an international community struggling to come to terms with the scale and myriad emerging challenges of the global health emergency. Consequently, while most of the Report's content focuses on the state of global markets and associated policy responses within the pre-pandemic world, the far-reaching impact of COVID-19 was understandably given prominence within UN messaging on 25 June 2020.[1] Moreover, considering the compressed timeframe that its authors were working within, it is to the credit of the UNODC, that the *Report* contains a substantial and forward looking discussion of the effects of COVID-19 on drug markets. As a reading of the publication reveals, however, the pandemic adds additional layers of intricacy to several already familiar trends and patterns. Indeed, amidst ongoing admission of high levels of uncertainty, data reveals that the global market continues to expand, increase in complexity, and change shape with ever greater alacrity. And it is the UNODC's increasingly sophisticated and nuanced analysis of such a reality that has resulted in what appears to be one of the longest Reports since it was first published in 1997.

Keeping with the booklet approach – but moving away from last year's experiment with grouping drugs by pharmacological effect – the 2020 *Report* is presented in six separate but interlinking publications. Following the overall summary provided in booklet 1, which includes a dedicated discussion of COVID-19, booklet 2 focuses on drug demand and pays attention to what the UNODC refers to as 'drug use disorders' and health consequences, with booklet 3 dealing with various aspects of drug supply. Reflecting a growing appreciation of the complex intersections characterising the contemporary drug market and related policy responses, booklet 4 addresses several 'cross cutting issues', including evolving trends and new challenges. Booklet 5 then provides a detailed analysis of the 'association between socioeconomic characteristics and drug use disorders'. Finally, and mindful of the thematic approach adopted, the UNODC uses booklet 6 to offer a useful 'Other Drug Policy Issues' category. As the Office notes, here the *Report* 'addresses a number of drug policy issues that all form part of the international debate on the drug problem but on which in-depth evidence is scarce, including access to controlled medicines, international cooperation on drug matters, alternative development in drug cultivation areas, and as has been increasingly the case in recent years the nexus between drugs and crime'.[2]

In line with the now usual high standards, when read together the set of booklets certainly 'provides a wealth of information and analysis'[3] of an impressively wide range of market dynamics and related issues. These include, among other things, a connection between world population growth and market expansion, the identification of urbanisation as a driving factor in current and future drug markets, the link between increasing wealth and rising drug use and conversely between poverty and greater risks of 'drug use disorders'. Relatedly, as has been the case in previous years, the *Report* shows that there remains an enormous shortfall in availability of 'drug-related treatment' for those that need it as well as a skewed accessibility of medicines for pain relief towards high-income countries. Also of note is the inclusion of a largely depoliticised discussion of legally regulated cannabis markets (4, pp. 81-100). This is reflective of an ongoing engagement with the intersection between markets and policy. Indeed, the inclusion once again of a dedicated 'Policy implications' section in booklet 1 (1, p. 29-36) is welcome and valuable in the UNODC's stated aim for the *Report* 'to support the international community in implementing operational recommendations on a number of commitments made by Member States, including the recommendations contained in the Outcome Document of the special session of the General Assembly on the world drug problem in 2016'.[4]

This is clearly an important ambition. That said, it must be noted that genuine achievement of such a goal requires a full, accurate and balanced assessment of the contemporary landscape, both in terms of increasingly complex market dynamics and associated policy interventions. Subsequently, despite welcome consideration of marginalised communities within booklet 5 (pp. 24-31), it is difficult to overlook the Report's inattention to drug policy related human rights abuses. As noted by IDPC and others elsewhere,[5] while there is abundant evidence demonstrating human rights abuses generated by drug policy action – and in some cases inaction – the UNODC largely ignores the issue; a substantial oversight

considering the multiple reference to human rights within the 2016 Outcome Document. Human rights violations feature to some extent in the discussion that follows. Nonetheless, this analysis uses the Report's contents as an entry point to not only highlight other ongoing issues of concern but also help initiate discussion and horizon scanning about an aspect of fluid drug markets that receives less attention. Consequently, representing the first analysis of its type, here we use the topic of technological innovation as a unifying theme to explore various parts of the 2020 *Report*, including where interpretation of the data is problematic and policy consequences overlooked or misconstrued.

While as old as punitive drug prohibition itself, engagement with emerging technologies by a range of actors involved with the illicit market and – often in response – government authorities is becoming an increasingly important part of the landscape. Indeed, although not always explicitly described as such, the close relationship between technological innovation, shifting market dynamics and associated policy responses can be seen to some extent across the entire *Report*. For instance, see the discussion of new psychoactive substances (NPS) in booklet 4 (pp. 59-67) and pre-precursors throughout the publication, but notably in booklet 3 regarding the manufacture of amphetamine type stimulants. Elsewhere, obvious connections are overlooked. For example, the use of solar panels to power ground water extraction by opium framers in Afghanistan.[6] Here we focus on the UNODC's analysis of cryptomarkets, evolving drug smuggling modalities and the government's use of spraying technologies in Colombia; aspects of which are all discussed to varying degrees within the 2020 publication. Moreover, while understandably not included in the *Report*, we also include a short overview of how civil society is engaging with technology in the pursuit of harm reduction and the promotion of human rights.

Increasing attention to cryptomarkets

A clear and welcome message from the *2020 World Drug Report* is that the international community now recognises cryptomarkets – online e-commerce platforms for illicit drugs operating over anonymising networks like Tor – as having a small but growing part to play in the development of drug markets worldwide. This is obvious from a passing glance of booklet 4. Just four years ago in the *2016 World Drug Report*, a search for the phrase 'dark net' highlighted about 25 hits across the main text and references, whereas in booklet 4 alone of the 2020 *World Drug Report* that number has increased to 268. Indeed, while the booklet has a specific section dedicated to the discussion of drug trafficking over the darknet, the authors mention elsewhere in the text broader implications. For example, with reference to the role it may play in increasing polydrug sales and its contribution to developing trends in drug use, from opioid use in Europe to the expansion of synthetic drug markets in Russia (4, pp. 21-22).

However, despite the increase in the quantity of darknet-related analysis, it is not always matched with a corresponding level of quality. Considered together, the various errors and questionable interpretations point to a determination to overestimate the success of approaches based on law enforcement and market closure on the development and uptake of cryptomarkets.. While technically challenging, there is clearly a need for an improvement in monitoring capabilities both within the UNODC and member states to keep up with changes in cryptomarkets. This lacuna is signalled by a reliance on research that is somewhat dated in a fast-moving landscape and some notable omissions on emerging trends regarding market innovations and the rise of new platforms. Several times in the piece, descriptions of technologies, tools and markets indicate a lack of familiarity with the practices of cryptomarket participants, which erodes confidence in the authors' general assessments. Overall, whilst the 2020 *Report* provides the UNODC's most in-depth analysis of the online drugs trade to date, there is some room for improvement. In this section we explore some of the main gaps and mischaracterisations presented in the *Report*.

Turning a blind eye on the positive aspects of cryptomarkets

With that in mind, the *Report* opens the section on cryptomarket drug trafficking by laying the groundwork for why it has become increasingly popular (4, p. 69). Users of such markets are said to prefer the perceived anonymity, lack of physical contact, the feedback and ratings systems that give them information about product quality and the payment protections afforded by the escrow system.

Yet the report does not explore the emergent body of literature that has developed around how these factors, in conjunction with discussions on

cryptomarket-related forums, help facilitate harm reduction opportunities amongst the population of cryptomarket participants who use drugs.[7] Cryptomarkets allow for quality information about products and discussion about dosing and safe use practices to be situated at the point of sale, which is simply not possible for street-level drug purchasing. Moreover, the lack of physical meetings between users removes possibilities for violence (including robbery) in drug transactions, and markets have been willing to work with harm reduction professionals to facilitate drug checking services for market participants, put out alerts about particular batches of drugs, ban vendors who are selling dangerous products and provide spaces for qualified drug experts to give advice to users.[8] The omission of these points suggests reluctance on the part of the Office to engage with any potentially positive outcomes that may be linked to the cryptomarket drug trade when compared to their offline counterparts.

A western-centric analysis

The same section also discusses the methods involved in selling drugs securely over cryptomarkets. However, the points made refer mainly to markets that cater to customers in Western nations and rely on national postal services to deliver their products. This feels like something of a missed opportunity. In the section of the Booklet dedicated to 'Changes in drug markets' (pp. 27-28), the *Report* includes a short summary of the most popular drugs sold on Hydra Market, a Russian cryptomarket that serves several countries within the Commonwealth of Independent States, and that uses a dead-drop system for delivery instead of the relying on postal services. (In the dead-drop system, a vendor will undertake delivery themselves (or assign a worker to do so), and they will hide the drugs in a physical location and send the delivery coordinates to the customer). Whilst the *Report* touches upon this method very briefly, much of the beneficial points it applies to Western postal markets (customers and vendors not being local to one another, not having to traverse into dangerous areas, vendors not requiring a critical mass of customers to sustain their market) do not necessarily apply to the Russian-language cryptomarket trade. As such the *Report* telegraphs from the start that much of the analysis to follow will be focused on Western cryptomarkets. Consequently, an opportunity to understand cryptomarkets as an emergent international phenomenon, where markets develop according to different social, political and legislative contexts, is missed.

This focus on Western markets continues within the first analytical judgement, offered as a section header, 'Confidence in the drug purchases over the darknet has started to suffer' (4, p.69). To support this claim, a detailed chart depicting the lifetime of markets between 2010-2017 (4, p. 68) is mislabelled as the lifetime of markets between 2010-2019. The error is a small one. Indeed, the *Report* has taken the chart from the 2017 *Drugs and the Darknet* report by the EMCDDA and Europol but quotes data from the *EU Drug Markets Report 2019* written by the same agencies. The market data from both reports is discussed, and the reader informed that only 10 of 110 markets that have opened since 2011 remained fully operational in 2019. An important omitted caveat, however, is that the data from both reports only includes English-language postal markets. Leading Russian-, Swedish- or Finnish-language markets are excluded, resulting in conservative estimates for the number of markets that have operated and remained operational at the time of writing.

Moreover, it is unclear that the link between market lifetimes and consumer confidence is fully justified. The *Report* points out that markets that remained operational in 2019 only launched the previous year, and this is framed as a reason why users may consider markets unreliable at present. Nevertheless, the authors also mention that the average lifespan of a cryptomarket is eight months, and the chart provided shows that all markets open at the start of 2014 had only launched the year before too. Despite these humble beginnings, over 40 new cryptomarkets launched in 2014 – an explosive year for cryptomarket growth –, which challenges the idea that short market lifetimes are a good indicator of a lack of consumer confidence. This point seems to be undermined further by the Global Drug Survey data presented, (4, p. 77; Fig 72, p. 28) which shows all-time highs for the number of users worldwide self-reporting that they have bought drugs from cryptomarkets in the past year.

Over-optimism on law enforcement impacts?

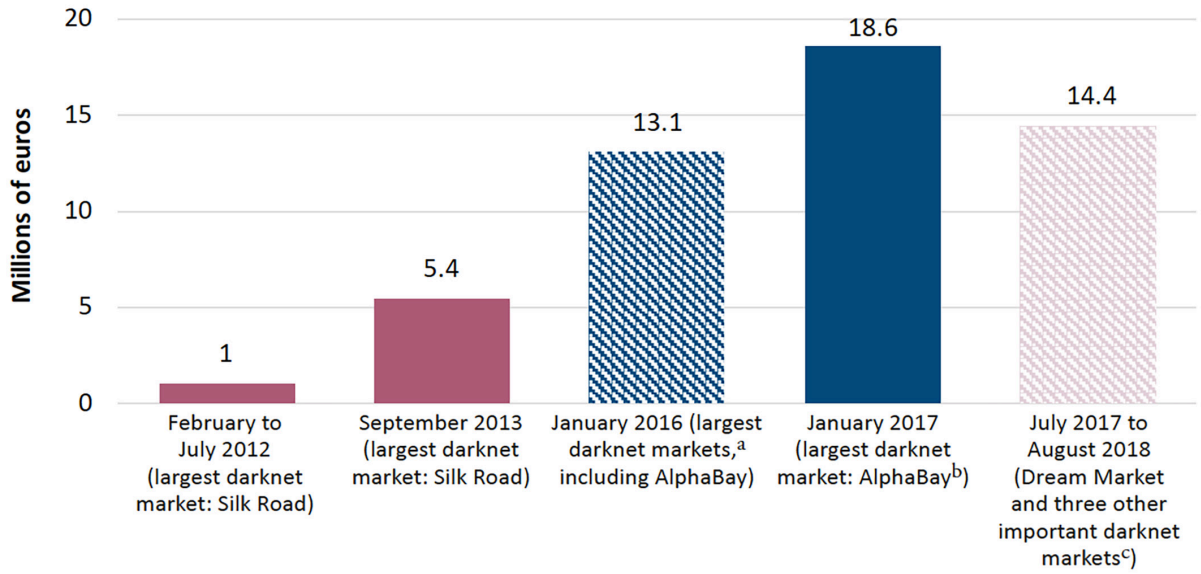
The *Report* then characterises the long-term impacts of law enforcement actions as 'unclear', which seems a generous assessment given the analysis that follows. The point is made that a large-scale shift away from cryptomarkets is unlikely, but that 'this does not mean that the dismantling of large sites will not have an impact…' (4, p. 70). To

support this contention, the *Report* points out that no clear market successor has arisen since Dream Market, a market that closed voluntarily in 2019. Yet the authors also seem aware that markets undergo periods of stability and disruption caused by law enforcement actions or exit scams, and then tend to stabilise again with one or two markets recovering the majority of market share. To illustrate this point, the *Report* then mentions the next market in line for the top spot, and indeed Empire Market went on to become the largest darknet market for most of 2019/20 until it exit-scammed in 2020, stealing the funds of its purported 1.3 million users.[9] In this section, the authors seem to argue long-term impacts based on clearly short-term trends in market disruption.

This optimistic tone is then carried into the next subheading 'Exit scams and shutdowns…have had an impact' (4, p. 70). The authors refer to a common argument that law enforcement impacts on cryptomarkets are short-lived, as markets quickly recover and users shift to new platforms. As if to counter such arguments, data is cited from the Global Drug Survey of some desistance amongst darknet users following the Hansa/Alphabay closures in mid-2017, with 15% of users starting they used markets less frequently and 9% stating they had stopped using markets. However, the same survey data shows self-reported use of cryptomarkets in the past year at an all-time high in 2020 (4, p. 76, Fig 72), and indeed the *Report* summarises the impact of shutdown operations as having lasted 'at least for a few months', implying that any impact was short-lived. This confusing paragraph seems to paint law enforcement impacts in an overly positive way that does not reflect reality.

An even stronger statement in the same vein is made in the next paragraph. Here it is noted that cryptomarket sales have finally bucked their long-term trend of increased profits. The authors provide data that compares sales revenue across markets across different time periods, and the revenues made by four markets between 2017

Figure 66 Estimates of monthly sales of drugs through different major darknet markets, 2012–2018



Sources: Nicolas Christin, "Traveling the Silk Road: a measurement analysis of a large anonymous online marketplace", proceedings of twenty-second International World Wide Web Conference, May 2013; Kristy Kruithof and others, *Internet-facilitated Drugs Trade: An Analysis of the Size, Scope and the Role of the Netherlands* (Santa Monica, California, RAND Corporation, and Cambridge, United Kingdom, 2016); EMCDDA and Europol, *EU Drug Markets Report 2019*; Nicolas Christin and Jeremy Thomas, "Analysis of the supply of drugs and new psychoactive substances by Europe-based vendors via darknet markets in 2017-18", background paper commissioned by EMCDDA for the *EU Drug Markets Report 2019*.

Note: The "major darknet markets" were identified by the respective authors. Even though global sales figures are reported, the identification of those markets may still have been influenced by the research focus of the authors, which was mainly on darknet activities in European Union countries.

[a] *The eight largest darknet markets for drug listings in January 2016 were AlphaBay (36 per cent of the listings on those eight markets, or 28 per cent of all available drug listings on darknet markets at the time), followed by Nucleus, Dream Market, Crypto Market, Hansa, Python, French Darknet and Darknet Heroes League.*

[b] *UNODC calculations, based on estimated daily sales of some 600,000 over the darknet.*

[c] *The three other darknet markets were TradeRoute, Valhalla and Berlusconi Market. TradeRoute disappeared because of an exit scam in October 2017; Valhalla was raided in February 2019; Dream Market was closed in April 2019; and Berlusconi Market was raided in November 2019.*

Credit: *World Drug Report 2020. Booklet 4 – Cross Cutting Issues: Evolving Trends and New Challenges*, p. 71

and 2018 are shown to be less than those made by Alphabay alone the previous year. This leads to the positive assessment that, 'Nevertheless, raids, exit scams…and voluntary closures appear to have at least temporarily halted the long-term upward trend in drug sales over the darknet'. This is a bold statement. Yet, there are serious questions about the validity of the assessment based on the data presented.

Figure 66 (4, p. 71) provides the data collected from a variety of sources to serve as estimates of monthly market sales volume at different times. All except the fourth bar are from academic papers assessing sales volume across one or multiple cryptomarkets, with the fourth bar being the UNODC's own calculations for Alphabay's overall sales volume in 2017. This is extrapolated from the research data that the third bar provides. The fifth bar contains data from Dream Market and just three other markets from the same period, whilst other markets that grew in popularity during this period – such as Nightmare Market and Wall Street Market – are excluded from the analysis. The claim that cryptomarkets have bucked a long-term trend in growth is built on comparing the extrapolated market share of Alphabay in its final year of being market leader, with the market share of four successors, one of which closed four months into the measurement period. Another reading of the same research data shown without UNODC's extrapolations in Figure 68 (4, p. 73) is as follows: within one month of Alphabay's closure, just four markets recovered and surpassed the sales volume that Alphabay had accumulated by January 2017, the third year of its operation. Within one year, Dream Market *alone* had surpassed the same figure. This is comparable to data from previous busts. Overall sales volume across all markets drops immediately after a law enforcement closure then recovers within a few months, albeit spread out across more markets. Over time, one market will develop an outsized market share, and then the cycle repeats when that market either exit-scams or is closed in a law enforcement operation.[10] The paper which provided the data shown in Figure 68 had a very different assessment to that given by the authors of booklet 4. To be sure, for Christin and Thomas, 'This calls into question the long-term impact of such takedowns on the overall online anonymous marketplace ecosystem'.[11] The UNODC decided upon a different interpretation, one that once again elevates the possibility that law enforcement activities can have some kind of long-term impact on cryptomarket growth.

Knowledge lag?

Alongside the persistence to frame law enforcement actions and market disruptions as significant, the *Report* seems to refer in several places to either outdated or incorrect understandings of cryptomarket practices and technologies. In the opening page of Section 4 (4, p. 67) a description is given of how users navigate markets through 'Specialized dark-net explorers (such as GRAMS… DuckDuckGo, Ahmia, Torch, Hidden Wiki, etc.)'. Whilst there is some truth to the fact that users navigate markets using trusted pages for links, not one of those listed are considered the key digital thoroughfares by which users navigate to markets.[12] Instead, for several years now news sites,[13] forums,[14] and more recently link distribution sites[15] and cryptomarket search engines,[16] have been key to doing so. Similarly, a discussion of Empire Market using 'sophisticated encryption programmes such as Pretty Good Privacy' (PGP) is also puzzling, as all western markets require vendors to use PGP and some require customers to do so too. Whilst these errors are small, they seem to provide a partial indication as to why the *Report* lacks a significant analysis of user-driven technical and methodological innovations that may have implications for market development going forward. These include improvements in distributed-denial-of-service defences, a shift to more anonymised cryptocurrencies and wallet technologies, and innovations in market design and security outlined in Europol's Internet Organised Crime Threat Assessment reports for 2019 and 2020.[17] Such an analysis may also examine the implications of the Russian cryptomarket tradecraft drifting West, as more Eastern European markets copy the dead-drop method of drug distribution that Hydra has made so popular.[18] While the *Report* does mention vendors decentralising away from cryptomarkets towards single vendor shops and encrypted apps (4, pp. 76-77), the implications of such a shift go unexplored.

These issues aside, the *Report* certainly provides some of the most solid and in-depth analysis of cryptomarkets to date. The comparison of annual illicit retail drug sales over cryptomarkets against street-level retail sales of drugs in the EU and USA (4, p. 72, Fig 67) highlights the fact that technology-assisted drug markets remain but a small part of the overall drugs trade for now, a point which law enforcement agencies and policymakers should consider carefully when setting spending priorities and budget allocations. Whilst centred on Western postal markets, the level of detail in

the analysis of trends, including breakdowns of vendor revenue across different time periods by country (4, p. 74, Fig 69) is mostly excellent. This analysis is complimented by partial data sets from Hydra market regarding the number of listings for drugs from sellers in Saint Petersburg, and Global Drug Survey data on self-reported darknet-use (4, p. 77, Fig 72; p. 75, Fig 79) which helps to fill in some blanks on the international picture and suggests that cryptomarket use is increasing in almost every country surveyed. The call for more global attention and analysis centred on technology-assisted drug markets has clearly been heeded by the UNODC in booklet 4, and the result has gone some way to meeting that challenge. Nonetheless, there is still a long way to go to get past the predominant focus on postal markets in Western nations and expand our understanding of how these markets are evolving independently according to different cultural, social and political contexts.

Colombia, coca, and counter narcotic technologies old and new

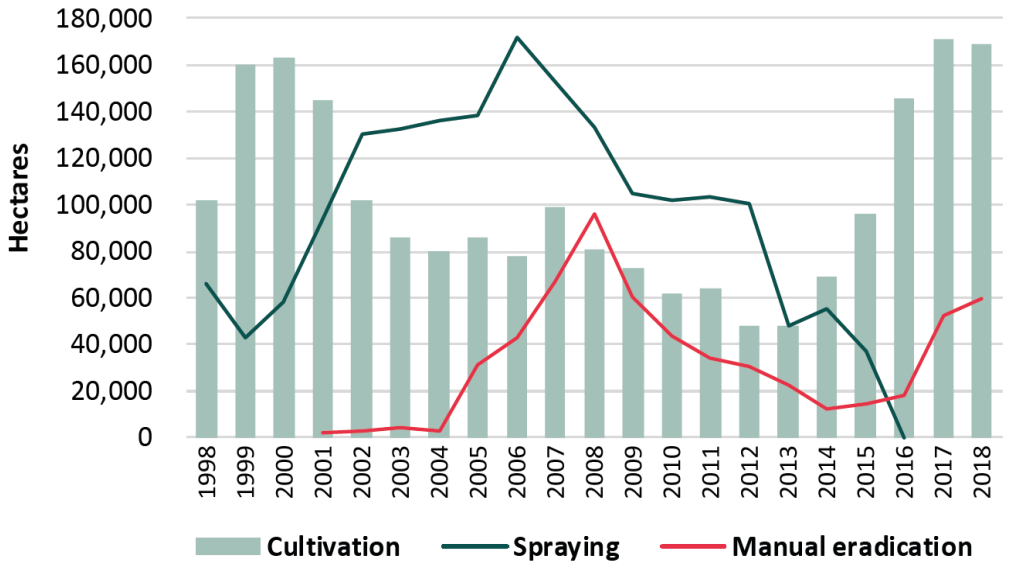
Problematic engagement with data is also a feature of the *Report*'s discussion of coca cultivation and resultant policy responses in Colombia. Indeed it is necessary to examine the Report's more general discussion of coca cultivation before moving on to our focus on technology.

Coca cultivation: Setting the scene

Within what is a relatively detailed analysis of 'Cultivation of coca bush and manufacture of cocaine', the Office is keen to highlight what might be considered a glimmer of progress within the Report's overarching narrative of market expansion. In so doing, it points out how 'Following a massive upward trend over the period 2013-17, during which the area under coca bush cultivation at global level more than doubled, the size of that area seems to have stabilized and remained, in 2018, at a historically high level'. 'According to preliminary estimates', the *Report* continues, 'the global area under coca cultivation may have even declined marginally in 2018 compared with a year earlier due to declines reported by Colombia (1.2 per cent) and Bolivia (Plurinational State of) (5.7 per cent), while comparable estimates for Peru are not available' (3, p. 21). Reflecting additional data-related challenges facing the Report's authors, we are also informed that 'Even though the final global estimates for 2018 are not available, preliminary results indicate that Colombia remains the country where the most coca leaf is produced'. Indeed, the 2017 figures – the latest for which comparable estimates are available – reveal that the country 'accounted for 70 per cent of the global area under cultivation' (3, p. 21).[19] Moreover, despite this slight decline, the *Report* notes that an increase in 'productive' areas, coca yields, fresh coca leaf production and laboratory efficiency[20] all combine to generate growth in the overall manufacture of cocaine. This is up 5.9% to 1,120 tons in 2018 (3. pp. 24-25). Importantly, while going unacknowledged, explanation of this situation highlights the limited utility of reduced hectarage as a metric for measuring policy 'success'.

More granular national level analysis shows that the limited decreases in cultivation in 2018 were seen in 'only about two thirds of all departments were coca cultivation is taking place' (3, p.23), with levels at the second highest ever reported in the country (3, p. 24). Explanations for this are complex. Yet while structural determinants certainly play a role,[21] the continuing high levels of coca cultivation – and consequently cocaine manufacture – relate in many ways to the landmark 2016 Peace Agreement between the Colombian government and the Revolutionary Armed Forces of Colombia (FARC), including the former's chaotic, unequal and incomplete implementation of a critical component of the deal, the *Programa Nacional Integral de Substitición de Cultivos de Uso Ilícito* (National Comprehensive Program for the Substitution of Illicit Crops).[22] The scheme, usually referred to by the acronym PNIS, incorporates an element of voluntary crop eradication by coca growing communities. In return growers are supposed to receive government subsidies and training programmes to help them transition to 'alternative, legal ventures'.[23] Despite high levels of compliance by families enrolled, few have received full – and in many cases any – payments or the promised technical assistance. Implementation was poor under the Santos administration; and since coming to power in 2018, President Iván Duque has been hostile to the Program. For some commentators 'he has crucially undermined' some of the agreement's 'key arrangements, especially the PNIS, which became one of the main targets of his government'.[24] Consequently, 'farmers who have given up their coca cultivation only to realize that they are unable to find an alternative way to make a living, are going back to their old trade and once again becoming vulnerable to coercion from armed groups seeking to gain control over the cocaine business that the FARC lost'. [25] According to Isabel Pereira from the Colombia-based

Figure 10 Area under coca bush cultivation, sprayed and manually eradicated in



Source: UNODC and Colombia, *Colombia: Monitoreo de Territorios Afectados por Cultivos Ilícitos 2018* (August 2019), and previous years.

Credit: *World Drug Report 2020. Booklet 3 – Drug Supply*, p. 24

research and advocacy organisation Dejusticia, 'These groups pressure farmers, sometimes in a violent way, to continue cultivating'.[26] The failure of the PNIS and underlying structural problems associated with Alternative Development more broadly are an important issues of concern in its own right and provides essential context for the discussion that follows. Our focus here, however, relates specifically to the UNODC's analysis of policy responses to the ongoing high levels of cultivation between 2016 and 2018. This period spans the beginning of important policy shifts and the cut off point for data included within the 2020 World Drug Report.

In addition to the narrative sections, some of which have been touched on above, as is the norm the 2020 *Report* includes many useful graphs and infographics. For instance, a cursory glance at Figure 10 (3, p. 24), 'Area under coca bush cultivation and manually eradicated in Colombia, 1998-2018', reveals the co-existence of three important phenomena since 2016: high levels of coca cultivation, steadily increasing levels of 'manual eradication' and the cessation of 'spraying'. Although certainly informative regarding headline figures and trends, it can be argued that the graph – and associated narrative – ignore what are far more complex relationships. Concerns in this regard can be identified in several interconnected areas.

Manual eradication: A problematic interpretation

First, there is an implicit assumption from the data presented that manual eradication is a positive intervention resulting in an overall reduction in coca cultivation. For example, it is noted that 'In parallel to the decline in coca bush cultivation in Colombia, by 2,000 ha, to 169,000 ha in 2018, manual eradication increased by almost 8,000 ha to almost 60,000 ha' (3, p. 24). This interpretation, or at least the presentation of related data within the *Report*, is problematic. Indeed, it is not clear from Figure 10 whether the manual eradication figures include those relating to the PNIS. Analysis by other organisations appears to include this data,[27] and consequently allows important comparisons to be made in terms of the implementation of different interventions. Moreover, evidence shows that voluntary eradication (sometimes known as voluntary substitution), what can be regarded as a subset of manual eradication, has led to a far lower replanting rate than in areas where forced eradication has taken place. Data from a ground-breaking UNODC evaluation of the PNIS apparently not incorporated in this year's *Report* shows that this equates to 0.6% versus 35% respectively.[28] According to Colombian press reports in early 2019, a source involved with the PNIS process noted that 'The most recent evaluation and measurement carried out by the United Nations show very important figures that confirm the social and environmental effectiveness of the

voluntary substitution strategy agreed in the peace agreement…There can be no doubt that the cooperation of farmers in substitution is the solid and sustainable way to end illicit crops'.[29] Such a conclusion should come as no surprise when looking at assessments, including those by the United Nations Development Programme, of recent experience to the south in Bolivia.[30] It might be argued that the findings of the evaluation came too late to be included in the 2020 *World Drug Report*. One would hope, however, that such important data is incorporated in 2021 along with more granular analysis of manual eradication, as will be discussed further below.

That said, beyond the ineffectiveness of forced manual eradication to produce sustained reductions in cultivation,[31] it cannot be overlooked how the practice is also associated with high levels of violence, human rights violations, and loss of life. Research from a range of organisations, including the UN itself, reveals an alarming number of deaths. These include members of forced eradication teams facing resistance from farmers – and sometime drug trafficking or armed groups – and from within coca growing communities, increasingly including community leaders. To be sure, while as Pereira notes within the context of the PNIS that the actions of armed groups are certainly a consideration, perhaps of greater significance are the human rights violations associated with what has been called 'violent eradication' practices overseen by the Colombian Ministry of Defence that run alongside the scheme[32] and are not mentioned in the *Report*.

The 'end' of spraying in 2016?

Second, a good case can be made that, when considered alongside 'spraying', the term 'manual eradication' lacks other important detail and is consequently misleading in another way. It is true that in May 2015 the Colombian government suspended aerial spraying, or fumigation, of coca crops using the herbicide glyphosate; a policy shift that some have incorrectly argued has been a key driver for the recent increase in cultivation.[33] The practice of aerial fumigation in Colombia – one of the only countries in the world to use the approach for crop eradication[34] – dates back to 1978 and efforts to control the illicit cultivation of cannabis.[35] Over the years it became more technologically sophisticated with the focus shifting to coca; a process that, due to crop displacement rather than elimination, led to an increase in geographical scope. In the face of growing security considerations around manual crop eradication techniques in the late 1990s, aerial spraying was regarded by the Colombian, and particularly US, authorities as a useful alternative.[36] It consequently became an integral part of Plan Colombia in 2000 and in many ways can be seen to have mirrored the enthusiastic take-up of state-of-the-art technology deployed in the Plan's counter insurgency component.[37] There is much to be said for the view, however, that the innovation represented 'the first bio-war of the 21st century'.[38] Fast forward 15 years and it will be recalled how the suspension was effectively forced upon Colombian authorities by a WHO research review classifying glyphosate (brand name Round Up) as potentially carcinogenic to humans.[39] Following a vote at the National Narcotics Council, the decision was taken to suspend aerial fumigation after a five month 'transition period'. Constitutional Court rulings in 2015 and 2017 also placed significant restrictions on the practice.[40]

On the face of it then, Figure 2 showing zero hectares sprayed since 2016 makes sense. What the *Report* fails to acknowledge, however, is that the Colombian government did not cease spraying glyphosate completely. It merely changed the method of delivery from 'crop-duster' aircraft to 'fogging' by ground-based operators; a method that again must be regarded as a component of manual eradication. This revised approach was announced in May 2016, after a suspension of all forms of spraying of just over 6 months.[41] As Eventon notes in his 2016 *Reforms in Reverse: Colombia Goes Back to Glyphosate,* 'For many Colombian analysts the decision to re-adopt forced eradication with glyphosate is inexplicable. Health and human rights implications aside, the policy has proven to be not just ineffective but extremely costly'. He continues, 'Even the most moderate criticisms that can be levelled at aerial fumigation – that it is expensive and ineffective – are even more applicable when applied to fogging'.[42] Recent accounts of forced manual eradication in the municipality of El Retorno (Guaviare Department) tell of how, having been deployed by helicopter, troops work to eliminate coca bushes 'with ground spraying of glyphosate and other times uprooting the plants'.[43] While precise country-wide figures dating back to 2016 remain difficult to find, a sense of the scale can be gleaned from press reports. For example, a 2020 *El Tiempo* article noted how the 'modality of terrestrial spraying with glyphosate', which is often now referred to as PECAT, had affected 34,000 hectares of 'drug crops'.[44] Studies show that the chemical risk to which 'PECAT operators' are exposed, either through inhalation or skin absorption, is 'potentially very high'.[45] While the approach is likely to be less

Box 1 Drug trafficking organisations and technological innovation

Mindful of the Report's overarching narrative concerning the increasing complexity and growth of global drug markets, it is fitting that the UNODC chooses to give some attention to the evolving form and operational practices of drug trafficking organisations (DTOs) as they seek to circumvent law enforcement measures operating – and often contributing to the flux – within this ever changing environment. While dispersed across several booklets, the essential context within which to locate such developments can be found within booklet 4 under the subheading 'Organization and specialization of criminal groups in specific areas'. Here it is noted how 'There has been general trend over the past two decades towards an increasing fragmentation of the serious and organized crime landscape and the emergence of more groups and looser networks'. 'Organizations based on loose cooperation across criminal networks', we are told, 'have proven more resilient to law enforcement interventions than other types, as a network that gets dismantled can, in general, be easily replaced by another'. Moreover, the *Report* continues, 'The landscape of the global illicit drug trade has thus become more complex, is rapidly evolving and is facilitated by new technology such as encrypted communications software and the darknet' (4, p. 17).

Beyond the substantial discussion of the darknet (which is addressed in the main body of this critique), the *Report* notes that the way drug trafficking organisations operate has been 'influenced by the growth of licit international trade and the emergence of new ways of transporting goods' particularly the use of containers. In this regard examples are given of DTOs using GPS to locate drugs shipments amongst multiple containers and hacking the computers of shipping companies to redirect containers within ports and thus enable easier retrieval (4, p. 19). Such approaches, however, appear somewhat dated when compared with emergent practices.

As the UNODC points out, 'In parallel, technological innovation has also enabled drug trafficking groups to acquire semi-submersibles to transport drugs, such as cocaine, from South America to Central and North America and more recently, even to Europe, without being easily detectable' (4, p. 19). As a dedicated box on '"Narco-submarines" in the Atlantic Ocean' in Booklet 3 (3, p. 31) explains, 'The use of submersibles or semi-submersibles traversing the Atlantic Ocean is a new development that poses additional challenges for law enforcement authorities trying to intercept cocaine shipments'. This is likely to remain an ongoing issue of concern for authorities since as the Council on Hemispheric Affairs points out, 'Criminal entities, particularly drug cartels, have the willingness to try new technologies and, most importantly, the monetary funds to acquire them'.[46]

In terms of a more ubiquitous form of criminal innovation, drawing on material from the US Drug Enforcement Administration, the *Report* also highlights how 'drones are being used by drug trafficking groups to assist them in the shipment of drugs across borders' (4, p. 19). To be sure, a growing body of evidence reveals that while in use for some time,[47] the sophistication and application of drones by DTOs has increased in recent years, particularly although not exclusively within the Americas.[48] Research presented in the *Small Wars Journal* in 2016 highlights how, although 'typically considered a tool for smuggling' they are 'increasingly seen as having application for other purposes including espionage, surveillance and as weapons'.[49] Unsurprisingly, just as state actors see additionalities through the use of drones, so do non-state actors like DTOs.[50] While not yet a key area of concern for authorities, weaponisation appears to be an emerging threat. As Boyle notes, 'The Mexican cartels have…been upping their game in terms of what drones are capable of doing. In 2017, a drug runner was caught with a commercial drone packed with a homemade bomb, the first time that law enforcement saw the use of weaponized drones along the border'.[51] Such a development was foreshadowed by Felbab-Brown the previous year. In a prescient analysis, she concluded, 'The new radical remote-warfare development on the horizon is for criminal groups to start using drones and other remote platforms not merely to smuggle and distribute contraband, as they are starting to do already, but to deliver lethal action against their enemies – whether government officials, law enforcement forces, or rival crime groups'.[52] More pressing contemporary concerns, however, include the ability of DTOs to generate GPS disruption and 'spoof' the more sophisticated surveillance drones used by the US authorities along the southern border with Mexico.[53] Such a technological 'arms race' between drug 'smugglers' and law enforcement authorities is certainly not a new phenomenon. The prohibitionist dynamics underpinning it are well understood. Yet, it is an issue that – in this *Report* and elsewhere – the UNODC is in a difficult position to fully address.

harmful to coca growing communities than what was often more indiscriminate aerial spraying, such findings do little to suggest that forcibly fogging coca plants with a dangerous compound sit comfortably with crop growing communities' human rights, including both the right to health and indigenous rights.[54] Indeed, as Jose David Hernandez, a farmer from rural Antioquia who grew coca until 2018, recalled of the aerial fumigations in 2003 and 2004, 'The herbicide would fall on the field like a toxic fog and cause irritation so painful that workers' skins would start bleeding'.[55] Speaking about such cases and the risks associated with glyphosate use, the former Health minister Alejandro Gaviria told the Colombia Constitutional Court in 2019, 'If health is a fundamental right, the state cannot deliberately act against the health of the population…It is not an academic or technical debate, but rather an ethical debate'.[56] Echoing such a view, an analysis of fumigations with glyphosate in indigenous territories in Colombia in the same year concluded that 'The Constitutional Court needs to examine the issue of ground glyphosate spraying…which should be prohibited under the precautionary principle until the true impact of this technique on population health and the environment is learned'.[57] Crucially, the authors of the analysis also determined that the same position should be applied to 'drone fumigation'.[58] And it is this emerging mode of glyphosate delivery that represents our third issue of concern.

Drones and fumigation: The illusion of a technological fix

While largely escaping scrutiny at the time or since, a key 2016 authorisation for ground-based glyphosate spraying also allowed for the use of drones. More precisely, in December 2016 the National Environmental Licencing Authority passed a resolution noting that, under certain conditions, '…fumigation using canopy-level low-altitude remote control spraying equipment (EATBAND), i.e. drones, is permitted'.[59] Mindful of the fact that the 2020 *World Drug Report* notes the use of drones and other technologically innovative modalities of DTOs (See Box 1), it is surprising that there is no mention of their likely deployment by the Duque administration. This is especially so since concern over increasing coca cultivation led to open consideration of drone use by the outgoing President Santos in June 2018. Then, within a broader geo-political context coloured by intense pressure from the Trump administration to reduce cultivation,[60] including threats to de-certify Colombia and encouragement to resume aerial spraying, he noted that the National Narcotics Council had 'discussed the use of so-called drones, unmanned aircraft that due to their height simulate ground, not aerial fumigation'. Admitting the harmfulness of the herbicide yet downplaying the ongoing risks of its use, he went onto say that 'Low-flying drones limit the dangers associated with glyphosate'.[61] Again, it might be possible to argue that the UNODC felt that the Santos announcement fell outside the timeframe for inclusion – even as a footnote – in the 2020 publication. This seems a generous view, however, considering not only the inclusion of both data from 2018[62] and examples of non-time specific information, but also that the topic had been mentioned by the International Narcotics Control Board in its Report for 2018, published in March 2019. Then it was noted how 'after a series of pilot tests, the Ministry of Health and Social Protection and the Ministry of Environment and Sustainable Development had authorised the use of drones for spraying glyphosate at a concentration level 50 per cent lower than that used previously'.[63]

To be sure, the deployment of drones – even if they will be using reduced concentrations of glyphosate – is an important, and in many ways worrying, development. Their attractiveness to Colombian authorities appears to be based on several perceived advantages over other eradication approaches. For example, initial reports suggest the modality is effective in the initial destruction of crops. According to the *Wall Street Journal* in August 2018, the Director of Fumi Drones SAS – the company providing equipment and training to the Colombian government – stated that drones had 'eliminated 90% of the coca on each acre (0.4 hectare) targeted during tests in the country's Narino province'.[64] Other commentaries highlight that compared to 'ground-based eradication teams, who spray the glyphosate herbicide directly onto plants from tanks mounted on their backs', drones could 'prove more efficient and tireless at the arduous task'.[65] Moreover, as noted above and despite ongoing uncertainties and human rights considerations, there remains a belief that the health risks associated with glyphosate are reduced to an acceptable level. It is also likely that proponents are attracted by the drones' potential to identify and spray drug crops with more precision than traditional aerial spraying. Drones fly far lower than is possible by much larger fixed winged aircraft. Despite the capacity of specialist agricultural airframes such as variants of the US

built Air Tractor to spray herbicide at especially low altitudes using 'state-of-the-art targeting and location' systems, including a combination of aerial photographs, satellite imaging and the Global Positioning System,[66] they would often be flown far higher to avoid gunfire from the ground; a practice that would frequently lead to glyphosate drift and arbitrary crop damage. Indeed, reducing the risks to those engaged in eradication efforts, both in terms of pilots (often US contractors) and ground-based 'manual eradication' teams is certainly appealing to policymakers in Bogota. All that said, problems remain.

As Felbab-Brown points out, coca eradication by drones represents nothing more than the 'illusion of a technological fix'. At an operational level, drones will not be immune to being shot down by farmers or drug traffickers. Further, she notes, 'Eventually, anti-drone defences, such as geo-fencing and drones to destroy other drones – which governments are currently exploring – will proliferate to non-state actors as well'.[67] Yet, as with President Duque's plans to ramp up manual eradication (uprooting plants), ground-based spraying as well as – at Washington's behest – resume aerial spraying,[68] the fundamental problem far exceeds issues with operationalisation. The utility of what might be called smart spraying (the eradication equivalent of precision guided munitions) is undermined by the flawed nature of forced eradication itself. Beyond data concerning the comparative success of voluntary eradication under the PNIS to affect replanting rates, a wealth of evidence exists to demonstrate its long-term ineffectiveness. As the Washington Office on Latin America has concluded, 'It's possible that crop eradication may be one of the least effective ways to reduce cocaine supplies'.[69] It is beyond the scope of this report to discuss alternatives to the existing and proposed range of forced eradication approaches. Suffice to say that the complex socio-economic and political environment requires a long-term and holistic approach, including the extension of governance structures into coca growing regions, land reform and genuine and appropriately sequenced development schemes of which the PNIS should be a part. Moreover, within the context of this analysis and demonstrating the double-sided character of technological innovation, it is interesting to note the planned use by coca growing communities of 'available technologies to video record the evidence of human rights violations once the spraying resumes'.[70] Such behaviour appears to be part of a broader trend among civil society actors to engage with technology in an effort to diminish the harm associated with punitive policies (See Box 2).

Spraying drones as a prelude to weaponisation?

Other concerns regarding drone use in Colombia relate to the trajectory of their deployment in the 'war on drugs' in Latin America more broadly. Their utilisation is not new. Rather it is plausible to suggest that it is a technologically facilitated facet of the shift towards what has been called 'remote control' warfare; a phenomenon with parallels in the pursuit of the 'war on terror' since 2001. The term describes 'the global trend towards countering threats at a distance without the need to deploy a large military force'. As Kersley explains, 'Pervasive, yet largely unseen, it minimises its engagement and risk while extending its reach beyond conflict zones. Remote warfare includes not only mass surveillance techniques, but also the use of drones, "special forces" and private military and security companies....'[71]

Within this context, Latin American governments have engaged with drone use for anti-drug efforts in several ways. First, they are used to detect cultivation within the region. For example, a 2011 official briefing retrieved via the Freedom of Information Act, revealed that the 'US Air Force is working to make its RQ-4 Global Hawk high-altitude long-endurance drones available to its allies in Latin America and the Caribbean in order to find drugs fields' and – indicating the often intertwined nature of the issues – 'helping plan offensives against rebel groups'.[72] Second, both law enforcement agencies and the military are looking to drones, including maritime varieties like the Israel Aerospace Industries Heron operated by the US navy, to assist in fighting so-called 'cartels' through the identification of trafficking routes and assisting with interdiction efforts. Evidence suggests that, in addition to high levels of drone use over Mexican territories and borders (especially with the USA)[73], at least 14 Latin American and Caribbean countries (including Brazil, El Salvador, Colombia, Panama, Trinidad and Tobago, Venezuela and Guatemala) have used, in collaboration with the USA or unilaterally through purchase from other countries, drones for this purpose.[74] Such purchases are often related to the state of wider diplomatic relations and long running 'collaborative' anti-drug endeavours, such as Plan Colombia or, in the case of Mexico, the Merida Initiative.

It is little surprise then that Bogota has reportedly been using the Boeing corporation's Scan Eagle since 2006 to 'fight drug trafficking, track guerrillas, and assist in hostage rescue efforts'.[79] That said, 'home grown' varieties are also part of the mix. In 2012, for instance, Colombian authorities announced the launch of a programme for the domestic production of drones to combat drug trafficking.[80]

Perceived advantages of what has been called the 'politics of verticality' and the 'constant stare' of aerial surveillance[81] are clear. Drones can remain aloft far longer than traditional early warning and control aircraft like the Northrop Grumman E-2 Hawkeye. And with 'drug cartels using harder-to-detect shipment methods like semisubmersibles (jury-rigged submarines), it's critical to have surveillance aircraft that can "perch and stare" for longer periods', observed P.W. Singer, director of the 21st Century Defence Initiative at the Brookings Institute in Washington DC, over a decade ago.[82] Moreover, for proponents of the 'war on drugs', drones become increasingly attractive as, ironically, the gains being made seem so small. From this perspective, 'If battlefield drones like the Predator can scan and bomb Taliban targets in the mountains of Afghanistan, the logic goes, a similar drone like the Heron should be able to find the "go fast" boats and submarines used by drug cartels in the waters of the hemisphere' as well as locate 'clandestine laboratories'.[83] Such logic has clearly been eagerly embraced and is now well embedded within a variety of anti-drug interventions around the world, but particularly in traditional producer and transit states. Indeed, as the Council on Hemispheric Affairs noted 2014, '… the era of drones in Latin America has begun, and the question now becomes how extensive and effective their usage will be'.[84]

Six years on, this remains an important and ever more pressing question. The emerging use of drones for spraying herbicides in Colombia demonstrates an evolutionary process away from merely surveillance and intelligence gathering operations. And as such one cannot help contemplating the further normalisation of what might be called 'ground engagement' in anti-drug operations. For instance, while very different types of unmanned aerial vehicles, could this be a prelude to the use of weaponised drones to kill 'high value targets' and a closer convergence to the tactics used in the war on terror and counter-insurgency operations in countries like Afghanistan? Such a shift would further illustrate the symbiosis between the two concept wars; the war on terror and its far older predecessor, the war on drugs.[85] In this instance the circularity of the relationship is illustrated in the use of drones to kill high value targets in counter-insurgency operations in different parts of the world growing 'partly out of the 1990s tactics in the war on drugs in Latin America, which focused on identifying and removing drug kingpin and cartel leaders'.[86]

Such speculation is not as outlandish as it may appear. Evidence already exists to suggest that the US military has used drones to target individuals engaged in various ways with the illegal drug trade. For example, '…a 2009 report of the Senate Foreign Relations Committee disclosed that the US military's target list for Afghanistan included drug lords suspected of helping finance the Taliban'.[87] It appears as if other countries, including China, are also considering a similar approach within their own zones of interest.[88] Conjecture about the trajectory of drone use in Colombian anti-drug operations must be considered within the broader context of several factors. These include discussions in 2013 around the planned use of GPS-guided smart bombs to target drug traffickers and their actual use against members of the FARC leadership[89] as well as the designation of drug trafficking groups as 'narco-terrorist' organisations to 'beef up legal cases against them'[90] and consequently justify targeting. Beyond evidence concerning the ineffectiveness of decapitation strategies,[91] the use of drones for assassination raises a multitude of questions around breaches of international law.[92]

Conclusions

In global drug policy debates, technological innovation is often framed as an instrument for disruption and as a cause of concern, if not alarm. That is certainly the approach adopted by the 2020 *World Drug Report*. As can be seen from the preceding discussion, the UNODC predominantly describes technological developments as a 'challenge' and a driver of the increasing complexity and resilience of illegal drug markets.[93] Indeed, even when looking beyond the 'threats' posed by illegal markets, new technologies, such as drones and cryptomarkets, are seen exclusively within the framework of law enforcement. While there is some truth in this perspective, the reality is far more complicated with the use of technology by both state and non-state actors generating both positive and negative outcomes.

Box 2 The civil society counterpoint: Using technology to advance public health and human rights

Amidst growing discussion of the relationship between technological innovation and evolving drug markets, it can be argued that too little attention is paid to how it can be deployed to advance human rights and to protect public health within the context of drug policies. In this regard, in November 2020, IDPC conducted a short survey to identify the ways in which its membership uses technology in its work. The responses show that the drug policy reform movement is using new technologies with three major goals – to reach out and deliver harm reduction services to people who use drugs; to monitor drug markets and drug use behaviour; and to better organise and coordinate. These are some of the examples gathered in the survey:

- **Using technologies to reach out and deliver harm reduction services to people use drugs.** Several IDPC members use messaging apps with encryption features, such as WhatsApp or Telegram, to engage with hard-to-reach populations. Encrypted messaging apps have two useful features for disseminating harm reduction materials: first, they allow services to target clients individually; secondly, encryption can be used to disseminate materials in jurisdictions where harm reduction services operate in legal grey areas. In the well-known case of Energy Control,[75] the NGO provides drug checking services to clients of darknet markets, and posts harm reduction information and the results of such tests on the same platforms. These results are also shared with health and law enforcement officials.
- **Using technologies to monitor the markets, and drug use behaviours.** Some IDPC members also report using social media and encrypted communication channels to engage with people who sell drugs and to monitor the evolution of the illegal drug markets. One member is involved in the creation of an early response network[76] that seeks to detect and disseminate alerts on new and dangerous substances. This network will be based on an online, real-time reporting and information system where consumers and practitioners will report unusual drug events, such as toxic drug supplies, or NPS. Beyond the IDPC network, a mix of field research and high-resolution remote sensing imagery, which can be obtained via aircraft or satellite, have been used to track the impact of illegal poppy cultivation on the development of some regions in Afghanistan.[77]
- **Using technologies to better organise the movement**. A majority of IDPC members are using video and teleconferencing services to organise and coordinate their activities, especially since the COVID-19 pandemic restricted mobility across the world. Some members have funded communities in less developed or more isolated areas that have limited internet connectivity, so that they could participate in online consultations and workshops. One member reported that it stores data concerning the human rights violations it documents in an online platform specifically designed for that purpose.

Some governments are supporting this trend – for instance, the Canadian government recently organised a 'Drug Checking Challenge' that sought to award funds for innovative proposals in drug checking services.[78] One of the finalist technologies will be used by an IDPC member to develop, again with public funding, a smartphone-based portable drug checking device and dedicated app. This initiative offers a sharp contrast with the framing of technology solely as a cause of alarm, as it is presented in the *World Drug Report 2020*. In this as in other areas, the UNODC and policymakers more generally would benefit from taking a more balanced and multidimensional approach to drug-related matters.

Within a policy environment where there remains a growing demand for a range of proscribed psychoactive substances, what might be termed a technological arms race has been a constant. In this regard 'The history of drug trafficking and crime more broadly is a history of adaptation on the part of criminal groups to advances in methods and technology on the part of law enforcement agencies and vice versa', observes Felbab-Brown.[94]

To be sure, technology is part of the ongoing process of market adaptation more broadly. Yet, as can be seen from examples in both the digital and off-line realm, law enforcement interventions seldom lead to permanent policy successes and market elimination. Rather they lead to increased market fragmentation and innovation on the part of those seeking to profit from the illicit nature of certain substances. It is also fair to argue that technological innovation on the part of law

enforcement agencies plays a role in criminogenic Darwinism whereby interventions tend to weed out 'the least competent traffickers' leaving behind 'the toughest, meanest, leanest and most adaptable organized crime groups'.[95] In short, technology can be seen as an integral part of the process through which law enforcement interventions in the medium and long term often make drug markets harder to police and ultimately more harmful.

While this is the case, and as can be seen in this year's analysis of cryptomarkets, the UNODC tends to overplay the effectiveness of law enforcement interventions and downplay policy failures. This is perhaps an inevitable result of the organisational and political environment within which the Office operates. However, this lack of balance can lead to incomplete and inaccurate analyses that do not allow for a full understanding of the drugs phenomenon, and of states' responses to it. Put simply, inadequate analysis will inevitably lead to inadequate policy recommendations. The UNODC must certainly be commended for the scope and increasingly sophisticated analysis provided across a wide array of drug markets and related issues. Yet, as noted elsewhere, 'The World Drug Report authors have an unenviable, and paradoxical task of outlining current trends in the "world drug problem", in the knowledge that to do so meaningfully can only speak to the continued failure of the UN drug control regime they are working within'.[96]

Beyond this fundamental dilemma, the exclusive focus on the nefarious use of technology by non-state actors also leads the *Report* to overlook several other important issues. First, as demonstrated through the discussion of drones in Colombia, beyond merely changing the shape of the illegal market, it is necessary to acknowledge the potential of state actors' use of technological innovation to directly generate a range of human rights violations, escalate levels of drug market-related violence and produce tensions within the realm of international law.

Second, despite a growing body of evidence concerning the harm reduction potential of cryptomarkets, the *Report* misses the opportunity to discuss the potential of cryptomarkets to disseminate health advice and harm reduction practices and how law enforcement interventions can undermine these efforts.[97] In this case, and mindful of the UNODC's increasing concern for, and attention to, the 'heath consequences' of drug use, the contemporary reality of drug markets only further compounds its awkward position within the drug control system. Moreover, it should be noted that a disproportionate emphasis on the dangers posed by new technologies also feeds into alarmist narratives that justify disproportionate drug control measures as the only valid responses to the evolution of drug markets.

This critique of the *2020 World Drug Report* should be seen as yet another example of how the UNODC's reporting, while commendable and sophisticated in many aspects, can also be unbalanced, and incomplete in places. These blind spots and inaccuracies are not inconsequential. There is a risk that they may be used by governments to justify an over-reliance on law enforcement approaches to curb illegal drug markets, while ignoring the harms caused by drug control from global drug policy debates. Given the fast-growing complexity and evolving nature of drug markets, the need for the UNODC to undertake additional efforts to gain a balanced and nuanced understanding of new trends and challenges are more necessary than ever. At a practical level, in the case of highly dynamic cryptomarkets this may include engaging with researchers with very specific areas of expertise. There were hopes that the new version of the Annual Report Questionnaire, adopted in March 2020 at the 64th session of the UN Commission on Narcotic Drugs, would help in that endeavour. However, a thorough understanding of drug markets and control policies will only be achieved once the data collected by the UNODC for its World Drug Reports documents the multifaceted aspects of drug control and its impacts on communities on the ground, including as it relates to human rights, development, levels of violence, impacts on prisons and so on. Until then, the *World Drug Report* risks suffering from an ongoing focus on law enforcement and criminalisation.

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The 2020 World Drug Report provides a comprehensive and sophisticated analysis of the current state of global drug markets, as their size, complexity and intricacy continue to grow. However, the Report can be criticised for turning a blind eye on the negative consequences of states' drug control efforts, and for overestimating the success of law enforcement approaches. To explore these shortcomings, this critique analyses the Report's approach to the key topic of technological innovation in drug policy, through a close reading of its sections on cryptomarkets, and on the eradication of crops destined for the illegal drug market in Colombia.

The International Drug Policy Consortium is a global network of non-government organisations that specialise in issues related to illegal drug production and use. The Consortium aims to promote objective and open debate on the effectiveness, direction and content of drug policies at national and international level and supports evidence-based policies that are effective in reducing drug-related harm. It produces briefing papers, disseminates the reports of its member organisations, and offers expert advice to policy makers and officials around the world.