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Exploring the use of social media and messaging apps to buy and sell drugs in New Zealand

A thesis presented in partial fulfilment of the requirements for the degree of

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Thesis Abstract

Introduction: The use of social media and messaging apps to facilitate drug trading has been increasing in recent years. This thesis presents the first exploration of social media drug markets in New Zealand.

Methods: Initial statistical analysis of New Zealand Drug Trends Survey data (N=23,500) was complemented by thematic analysis of anonymous semi-structured messaging app-based interviews (N=33) with people who purchased and/or sold drugs via social media. Additional observational data was collected on Discord drug servers (N=7). Qualitative data were analysed using an interdisciplinary theoretical framework drawing on concepts from drug market and drug use studies as well as communications and social media scholarship.

Findings: Survey modelling indicated that younger age groups (16<20 years) were most likely to purchase drugs via social media. Social media drug purchasing was also associated with a greater likelihood of transacting with a commercial seller type. These patterns indicate potential for young people to engage with higher-risk commercial local drug markets. This was evidenced in interview and observational data on “lower tier” Discord drug servers, where members often contended with ‘fake’ drugs and robbery. However, interview data showed not all social media and messaging apps facilitated the same types of digital drug market dynamics. Encrypted messaging apps were often linked to trusted commercial sellers, while ‘low security’ options like Messenger and Snapchat were often used in contexts of social supply due to their association with pre-existing friendships. The latter dynamic could enable young people to extend many of the risk reducing benefits of social supply. Many interviewees reported low concern for being caught by police as part of social media drug trades, but continued to engage in digital risk management behaviours aimed at reducing their potential for exposure to others, including the police, on social media.

Conclusions: The incorporation of diverse social media and apps in harm reduction strategies to reach different groups is recommended. However, the convenience of social media drug access and potential for increased drug market harm add to the case for substantial drug policy changes in New Zealand, including changes to prioritise decriminalisation and non-punitive responses to drug use and low-level drug supply behaviours.

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The present study obtained ethics approval from the Massey Human Ethics Committee Southern A (Application code: SOA 20/22).

About doctoral thesis ‘with publications’

This thesis is completed in a ‘with publications’ style whereby it includes a series of journal articles at varying stages of publication or journals submission. In this case, each of the finding’s chapters in the body of the thesis takes the form of a standalone journal article which has been structured for publication. This thesis hereby conforms to the Massey doctoral thesis with publication guidelines (Massey University, 2022).

This thesis is presented as an integrated whole in the same style as a thesis by monograph. In this vein, Chapters 1 and 2 provide a literature review, Chapter 3 presents the theoretical framework for this project, while Chapter 4 details methodology. Chapters 5-9 comprise the findings chapters, while Chapter 10 presents a synthesis of findings, drawing together literature and theory presented in Chapters 1 through 3.

The citations of the journal articles contained in this thesis and their publication stage are listed in the table below. I hold first authorship on all papers, with co-authors consisting of my supervisory team and where applicable other SHORE & Whāriki staff who contributed significantly to a specific article. Appendix A presents a completed statement of contribution for each journal article. Each article is presented in accordance with their respective publishers’ author copyright permissions.

Chapter	Citation	Publication status
Chapter 5	van der Sanden, R., Wilkins, C., Romeo, J. S., Rychert, M., & Barratt, M. J. (2021). Predictors of using social media to purchase drugs in New Zealand: Findings from a large-scale online survey. <i>International Journal of Drug Policy</i> , 98, 103430. https://doi.org/https://doi.org/10.1016/j.drugpo.2021.103430	Published
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List of Acronyms

API	Application programming interface
ATS	Amphetamine-type stimulant
ASW	Amazon Web Services
CCA	Customs-controlled area
DNM	Colloquial acronym for darknet market
EU	European Union
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
ESR	Institute of Environmental Science and Research (NZ)
FB	Colloquial acronym for Facebook
GDPR	General Data Protection Framework (EU)
GCSB	Government Communications Security Bureau (NZ)
IDMS	Illicit Drug Monitoring System
IG	Colloquial acronym for Instagram
IRC	Internet Relay Chat
KYSNZ	Know Your Stuff New Zealand
LSD	Lysergic acid diethylamide
MDMA	Methylenedioxy-methylamphetamine
NPS	Novel psychoactive substance (alternatively 'new psychoactive substance', or 'research chemicals')
NZ	New Zealand
NZDTS	New Zealand Drug Trends Survey
NZHS	New Zealand Health Survey
PGP	Pretty Good Privacy
SNS	Social networking site
UGC	User generated content
UNODC	United Nations Office on Drugs and Crime
UK	United Kingdom
URL	Uniform Resource Locator
US	United States
VPN	Virtual private network

Glossary

App	Shorthand for 'application'. A software program which is specifically for mobile digital technology, such as smartphones, tablets or iPads.
Administrator	Someone who administers or runs an online community. Shorthand: 'admin'.
Big data	A data-based "information asset" characterised by the use and compilation of vast data sets from a large variety of different sources, which can be processed at high-speed using powerful computer processing and algorithmic analysis to generate insights or "value" which could not be extracted if the data were not in digital form (De Mauro et al., 2016).
Channel	The term describing a public group chat on a Discord server. Each Discord 'server' (see below) can be comprised of many different channels that all have specific functions or are oriented towards certain types of discussion.
Cryptocurrency	A type of decentralized digital currency based on cryptography-derived technology (DuPont, 2019). Examples include bitcoin, Ethereum, Monero.
Darknet market	Often referred to as a 'cryptomarket' by researchers. Darknet markets are large, eBay-like marketplaces located on the darknet (see 'dark web'). These sites predominantly sell drugs, but often also malware and stolen credit card or personal data dumps. They enable strangers to buy and sell anonymously in a competitive marketplace environment, with payments completed via cryptocurrencies like bitcoin and Monero, and goods shipped via the postal service (Barratt & Aldridge, 2016).
Dark web	A subsection of the deep web (alternatively referred to as the 'darknet') oriented toward preserving online privacy using anonymizing technologies and encryption to create a "hidden" online location. Dark web content can

only be accessed using specialized browsers (e.g., TOR browser) (Barratt et al., 2018). Darknet markets are hosted on the dark web (EMCDDA, 2016).

Deep web	An umbrella term for all unindexed web content. Deep web content includes examples like email addresses, chat messages, private social media content and online banking (Patrizio, 2021).
Digital trace data	An umbrella term describing the “records” (traces) generated from any activity which takes place in an online environment (Howison et al., 2011).
‘ecstasy’ (noun)	A term used to refer to MDMA – a type of hallucinogenic stimulant – in the form of a pressed pill or tablet. In this project ecstasy is not used as a standalone term, rather references are made to ecstasy/MDMA or MDMA as a standalone. This reflects changes to understanding and terminology around MDMA use, where alternate slang terms for MDMA in powder form can mean younger age groups in particular do not equate MDMA with ‘ecstasy’ (Palamar, 2014). See terms ‘gear’ and ‘molly’.
End-to-end encryption	A type of encryption which ensures sent data cannot be decrypted and read or altered by any party other than the intended recipient.
‘Gank’ (verb)	Refers to being robbed. Example phrase: “ <i>I got ganked</i> ”. Usually implies a higher level of force or violence than the related term ‘roll’ (see below) and alludes to gang involvement. The term may also be used as a noun to describe multiple robberies (‘Gankings’).
‘Gear’ (noun)	A common slang term largely used to describe MDMA powder in New Zealand. May also be used to refer to other (predominantly powder form) drug types, like methamphetamine.
Invite link	The weblink needed to gain entry into a Discord server.
Metadata	“Data about data” (Kitchin, 2014). Metadata refer to the data generated alongside and attached to another, larger data source, such as a message.

In this case, metadata refer to details like data and time stamps, sender and receiver information, and message length.

Meth	Shorthand for methamphetamine.
'Molly' (noun)	See entries for 'ecstasy' and 'gear'.
Moderator	See 'administrator'. Typically, moderators are appointed to help the server administrator manage member behaviour. Shorthand: 'Mod'.
'noob'	Someone who is inexperienced in a particular activity or environment.
Platform	<i>"A programmable architecture designed to organize interactions between users"</i> (Van Dijck et al., 2018, p. 3)
Recreational drug use	Drug use tied primarily to leisure settings. Recreational drug use may encompass heavy, frequent, or risky drug use patterns (e.g., polydrug use) (Nicholson et al., 2002), but is most often associated with occasional, "functional" drug use that is viewed as low risk by participants (Askew, 2016).
'Roll' (verb)	To be robbed or ripped off. Example phrase: <i>"He rolled me for a fifty bag"</i> .
'Sesh' (noun)	Shorthand for 'session'. Often refers to the act of taking drugs together with friends.
'Server' (noun)	The platform-specific term for a group or community created on the social media platform Discord.
'Snap' (noun)	The term for sending photo-based messages on Snapchat (e.g., <i>"I sent him a snap"</i>). May also refer to shorthand for the app itself (e.g., <i>"add me on Snap"</i>).

Social media	<i>“Web-based services that allow individuals, communities and organizations to collaborate, connect, interact and build community by enabling them to create, co-create, modify, share and engage with user-generated content that is easily accessible” (McCay-Peet & Quan-Haase, 2016, p. 6).</i>
‘Trap’ (verb)	To sell drugs. Example phrase: <i>“When I was trapping...”</i>
Tor browser	A specialized internet browser which facilitates access to dark web content. The Tor browser directs user traffic through a network of IP addresses or ‘relays’ to mask a user’s original location. Also known as the Onion router (Barratt et al., 2018).
Tor market	A largely domestic darknet market in New Zealand.
‘Tinny’ (noun)	A slang term typically referring to a \$20 amount of cannabis in New Zealand. So-called because the product is often sold wrapped in tinfoil.
‘Tinny house’ (noun)	Describes a specific type of drug market dynamic in New Zealand where drugs – typically cannabis – are sold from a private residence which is in effect ‘open’ to the public.
Web 2.0	A term first coined in 1999 (DiNucci, 1999) to describe a period in the development of the internet characterised by democratization of internet engagement, content authorship, and more flexible and creative web design (Murugesan, 2007). The first social media websites emerged during this time.
‘Weed’ (noun)	Common slang term for cannabis.
Surface web	Also known as the ‘clear web’. Online content that is indexed by search engines such as Google and can be easily accessed via google searches. Surface web traffic is not encrypted and therefore facilitates the collection of digital trace data (see above) by search engines, and other private and public third-parties (Barratt et al., 2018).

'Verification' (noun) The process of 'proving' oneself a legitimate buyer or seller to either join and/or transact on a drug server. May also describe an account status attributed to members who have successfully received verification.

Example phrase: *"I only buy from verified sellers"*.

'Vouch' (verb) To testify to the trustworthiness of another drug buyer or seller. Example phrase: *"He vouched for me"*. May also be used as a noun. Example phrase: *"Before I buy, I always check for vouches"*.

Chapter 1: The rise of digital drug markets

Digitally mediated drug supply occupies a small but growing part of the contemporary global drug trade. In recent years the number of digital channels facilitating the sale of drugs has increased and diversified, spanning across the surface, deep and dark web (UNODC, 2021b). The darknet market represents the most widely studied and well known of the contemporary digital drug markets. These websites, located on the 'hidden' dark web, resemble surface web marketplaces such as eBay or New Zealand's Trade Me, where strangers located across the globe can buy and sell drugs anonymously, with goods sent via the local postal service (e.g., Aldridge & Décary-Hétu, 2014). On the surface and deep web, online pharmacies sell counterfeit or unregulated medications and pharmaceuticals – often without the need for a prescription (Mackey & Nayyar, 2016), while webshops sell Novel Psychoactive Substances (NPS), precursors and cutting agents (See Glossary for definitions of surface, deep and dark web) (EMCDDA, 2011; UNODC, 2021b).

Academic interest in digitally mediated drug markets has largely concentrated on the darknet market ecosystem. As a result, current understanding of how digital technology may be facilitating local, regional, or city-based retail-level drug markets involving transactions completed largely in person remains in its infancy. Social media and messaging apps provide a notable example of one such digital technology that has increasingly been linked to drug trading behaviours. These platforms offer buyer and seller the ability to connect using familiar, already in-use technologies, providing streamlined entry into what are often local drug markets (e.g., McCulloch & Furlong, 2019; Thanki & Frederick, 2016). However, the social, political, and economic complexity of these platforms, coupled with their centrality to people's day-to-day lives make them potentially novel and challenging digital spaces to adapt to drug trading behaviours. This study explores how social media drug markets are operated in New Zealand, alongside some of the impacts these emerging markets may have for people's existing practices of buying and selling drugs.

This chapter begins by painting a picture of contemporary digitally mediated drug markets (Section 1.1). I begin by discussing the darknet market ecosystem– the most influential and culturally entrenched of the current digital drug markets (Section 1.1.1). Section 1.1.2 presents an overview of the key trends characterising and shaping contemporary darknet drug trading. From

here, I then discuss the challenges facing contemporary darknet markets in terms of their wider adoption as channels of retail drug supply to establish how this may feed into the adoption of social media for drug trading (1.1.3). This is followed by a section on online pharmacies and NPS webshops (1.1.4), which helps to situate discussion of social media drug markets within a broader context of surface-web drug markets. Finally, I discuss the importance of online drug content and drug-related communities as foundational element underpinning the development of digitally mediated drug supply on social media and online generally (Section 1.1.5).

In Section 1.2 I present an overview of New Zealand's contemporary drug landscape. I start by discussing the historical availability of different drug types in New Zealand, and how this has impacted on local patterns of use. From here, I move into a discussion of local drug markets and drug purchasing patterns (1.2.1), which then paves the way for consideration of the potential for online drug supply in New Zealand, and current indications this phenomenon is occurring locally (Section 1.2.2).

Existing scholarship on social media drug markets is discussed in Section 1.3. This sets the stage for establishing the project research objectives, which are presented in Section 1.4 of this chapter. In Section 1.4.1 I outline the research questions that frame the presentation of findings in subsequent chapters. Finally, Section 1.4.2 presents an outline of the thesis as a whole and the chapters to come.

1.1 Contemporary online drug markets

1.1.1 Darknet markets

Located on the dark web, and only accessible using specialised web browsers such as TOR (the onion router), darknet markets first emerged in 2011 with the establishment of the original Silk Road marketplace (Chen, 2011). The darknet marketplace structure makes use of the unindexed, encrypted nature of the dark web coupled with cryptocurrencies, most notably bitcoin, to facilitate transactions within an anonymous marketplace between buyer and seller who do not know one another's physical identities (Barratt & Aldridge, 2016). The darknet market is organised around a powerful construct of seller reputation, which combines a comprehensive feedback system and reputation metrics with third-party dispute resolution services and escrow payment options. In this vein, darknet markets are specifically designed to facilitate low risk trading between strangers in an illegal market context, which would otherwise be difficult to sustain (Przepiorka et al., 2017; Tzanetakis et al., 2016).

Since these early days darknet market technology has developed, but the core features of these marketplaces remain largely unchanged. For example, payment using alternative cryptocurrencies to bitcoin appears to be increasing (Europol, 2019b). In particular, Monero has fast become one of the primary modes of payment on darknet markets and is often regarded as a ‘more private’ form of cryptocurrency than bitcoin (Europol, 2020, 2021; Shortis et al., 2020). Additionally, though goods continue to be delivered largely via international and domestic post, reports suggest that alternative delivery methods such as dead drops – where a seller hides the goods and shares the geolocation coordinates with the buyer – may be increasing as a mode of completing transactions in some countries (Greenberg, 2019; O’Sullivan, 2019).

Darknet markets have provided researchers with the ability to observe and analyse elements of the illegal drug trade that had until this time been difficult to verify or hidden from view in studies of non-digitally facilitated drug markets (Enghoff & Aldridge, 2019). The range and amount of digital trace data generated from darknet market transactions have supplied researchers with drug price and quantity data, information contained on vendor profiles, listing numbers and buyer feedback. All these data sources offer valuable insights into how darknet markets are used, by whom, for what purposes and the impact they may have in offline drug markets (Décary-Héту & Aldridge, 2015; Enghoff & Aldridge, 2019). Additionally, the accessibility of market-linked user forums has provided valuable opportunities for researchers to engage with darknet market communities directly, facilitating rich qualitative enquiries (Barratt & Maddox, 2016; Kaufmann & Tzanetakis, 2020).

The unique features of darknet markets and the structuring of transactions to avoid physical interaction between buyer and seller have prompted researchers to suggest these spaces help people transcend some of the ‘traditional’ risks associated with drug market transactions between strangers, such as the risk of violence, potential for opportunism and exposure to police (Aldridge & Décary-Héту, 2014, 2016; Barratt et al., 2016). As a result, Aldridge and Décary-Héту (2014) term the darknet market a “*paradigm shifting criminal innovation*” (p. 3). They suggest that darknet markets present buyers and sellers with a large, low-risk global marketplace to transcend both local market constraints and drug market risks. Meanwhile, wholesale transactions taking place on these platforms imply the potential for darknet markets to impact on local drug market settings (Aldridge & Décary-Héту, 2016). Additionally, review systems and dispute resolution help to hold sellers accountable for the quality of their products and incentivise more customer-oriented behaviours (e.g., Bakken et al., 2018; Tzanetakis et al., 2016). Indeed, there is an understanding among people who use drugs that darknet-sourced drugs are often high quality (EMCDDA & Europol, 2017). But academic research on whether darknet-sourced drugs are in fact

higher purity than 'offline'-sourced drugs has yielded mixed results. One study involving the testing of 219 darknet market purchased drug samples found darknet drugs more often tested 'as advertised' than those purchased 'offline', and over 60% of samples contained no adulterants (Caudevilla et al., 2016). Results from another study contrasting 'online' purchased drugs (darknet and surface web) with 'offline' samples found minimal differences in drug purity and adulteration levels between the two sources (van der Gouwe et al., 2017).

1.1.2 Characteristics of the contemporary darknet market drug trade

Since their emergence darknet markets have predominantly been used to buy and sell drug types like cannabis and popular stimulant drugs like MDMA and cocaine powder (Kruithof et al., 2016; UNODC, 2022). Notably, drug types such as crack cocaine and heroin, which are traditionally associated with offline drug market violence, are among the drug types least often sold on darknet markets (Aldridge et al., 2018). This reflects the concentration of darknet market trading in western drug consumer countries: namely, the "big five" – the US, the UK, Germany, the Netherlands and Australia (Broséus, Rhumorbarbe, et al., 2017; Dittus et al., 2018). Dittus et al. (2018) suggest that darknet drug supply represents the "last mile" of the global drug supply chain, as both buying and selling are heavily concentrated in the global west. Western areas involved in the production of synthetic drugs such as MDMA (e.g., Germany, the Netherlands, and Belgium) play a central role in darknet marketplaces, while non-western production hubs for drug types like cocaine (e.g., Colombia, Bolivia, and Peru), or heroin (e.g., Afghanistan) do not often participate in darknet trading directly (UNODC, 2020, 2021b). As such, darknet drug transactions reflect a 'digital divide', where producers or wholesalers in developing countries may not be as easily able to access the specific software and technologies needed to use the darknet market successfully (Dittus et al., 2018).

Furthermore, though darknet market drug trading volume appears to have increased in recent years, it continues to represent a very small fraction of total global drug trade (UNODC, 2021b). The UNODC estimated in 2020 that the total volume of darknet market drug-related trading reflected only 0.15% of the combined estimated retail level sales in both the US and the EU for the same year (UNODC, 2021b). Preliminary data for late 2021 from both the UNODC and the EMCDDA indicates what appears to have been a significant downturn in darknet market revenue during this period, however it remains to be seen whether this is a signal of broader trends to come, or simply a temporary change (EMCDDA, 2022; UNODC, 2022).

Researchers have shown the majority of darknet drug trading takes place within domestic drug supply chains (Demant, Munksgaard, Décary-Hétu, et al., 2018; Norbutas, 2018). This is somewhat surprising given the darknet's technical potential to transcend local drug market constraints by connecting buyers and sellers located in different countries and global regions (Aldridge & Décary-Hétu, 2014). However, the need for international shipments to clear customs is perceived by darknet vendors and buyers alike as increasing the risk of being caught or creating opportunities for buyers to scam vendors more easily by claiming order non-arrival (Décary-Hétu et al., 2016). This increased risk perception is particularly strongly linked to geographically isolated drug markets such as Australia, where stringent border controls have led many international vendors to refuse to ship to the country (Broséus, Morelato, et al., 2017; Cunliffe et al., 2017). This has had the effect of creating a thriving local darknet trade, particularly for substances such as methamphetamine (Cunliffe et al., 2017). A similar phenomenon of localised darknet drug trade has been observed in New Zealand and is discussed in more detail in Section 1.2.2.

In combination, these trends provide an indication of several key challenges to the wider adoption of darknet markets, which may ultimately curtail some of their 'paradigm shifting' potential. Of particular relevance to this study is understanding how a combination of different factors may result in these markets becoming *less*, rather than more accessible overtime.

1.1.3 The useability problem facing darknet markets and their uncertain future

Darknet markets present their users with several technical and reliability challenges that discourage wider engagement with this form of digital drug market. Firstly, transactions present both buyers and sellers with novel risks. Though features such as feedback and ratings systems provide a means of promoting trustworthy transactions, financial scams resulting in loss of cryptocurrency for the seller or product for the buyer have become an established form of transaction risk on darknet markets (Moeller et al., 2017). Alternatively, the site administrator can perform an 'exit scam' by deleting the marketplace and taking user escrow-deposited funds with them, as illustrated by the disappearance of popular darknet market Evolution in 2015 (Greenberg, 2015). The use of local postal services represents another point of insecurity, particularly for buyers who are at risk of being apprehended by police if their order is seized (Aldridge & Askew, 2017). Additionally, the organisation of buying and delivery via post adds an element of inconvenience to darknet drug trading as purchases need to be planned in advance, and may encounter shipping delays.

Notably, from the seller perspective, building a profitable business using darknet markets can also be more challenging than it initially appears. Because of the importance of reputation in the darknet setting, buyers tend to disproportionately favour a small handful of vendor accounts that have a substantial darknet transaction history and reputation to match. Researchers have shown that as a result, most vendor accounts make few sales, thereby limiting the growth potential for new market entrants and curtailing competition (Paquet-Clouston et al., 2018). Indeed, most vendor accounts on darknet markets appear to be short-lived, with UNODC data collected from 38 monitored darknet markets (2011-present) indicating the median lifespan of vendor accounts is only 101 days (UNODC, 2022). Considerable costs and work may be involved in establishing vendor operations on darknet markets, such as building a marketplace reputation, sometimes using ‘freebies’ to attract customers (Ladegaard, 2018a), and developing a range of digital and physical operational security practices, including stealth packaging (Afilipoaie & Shortis, 2015). As such, it may be the relatively short average lifespan of many vendor operations points to deeper issues around the financial viability of establishing a successful darknet selling operation, which may limit the potential for its more widespread adoption.

These uncertainties and difficulties are coupled with a recent history of successful, international police operations targeting major darknet markets (Greenberg, 2017, 2018). Though wider darknet drug trading continues to bounce back from law enforcement disruption (Décary-Héту & Giommoni, 2017; Ladegaard, 2019, 2020), successive operations may have had the effect of destabilising the darknet market model (e.g., Europol, 2018). In keeping with this trend, recent reports from the UNODC, EMCDDA and Europol indicate increasing fragmentation of the darknet landscape (EMCDDA, 2022; Europol, 2021; UNODC, 2022). These reports suggest a potential shift towards smaller darknet markets and an increase in independently run vendor webshops (Europol, 2021; Laferrière & Décary-Héту, 2022; UNODC, 2022). Furthermore, they underscore the growing popularity of end-to-end encrypted messaging platforms like Wickr among darknet vendors, who often list their Wickr or Telegram usernames on their darknet profiles, facilitating the movement of transactions away from the darknet marketplace (Childs et al., 2020; Europol, 2021).

A further blow to the accessibility of the darknet market has been the shutting down of independent, surface web darknet market forums and informational resources since the subreddit *r/DarknetMarkets* was banned in 2018 (Franceschi-Bicchierai, 2018), followed by DeepDotWeb in 2019 (Europol, 2019a). The shutdown of these surface websites was a significant loss for the darknet market community as both provided valuable sources of information, particularly to new entrants, and their connection to the surface web made them easily accessible steppingstones

into darknet market engagement. For example, DeepDotWeb provided up-to-date .onion URL's¹ for major markets, while r/DarknetMarkets provided community-led information on market developments, product reviews and vendor arrests. The main subreddit was accompanied by an additional subreddit r/DarknetMarketNoobs and the related resource the 'DNMBible', which compiled up-to-date information on darknet engagement for any would-be darknet buyer or seller. Shortis et al. (2020) suggest this type of surface-web resource has played a significant role in the growth of darknet markets. Though several alternative forums have been established, these have been pushed into the dark web (Shortis et al., 2020), with ramifications for the ease with which newcomers can enter the darknet market system.

The loss of these centralised surface web resources has been paralleled by darknet market adaptations to continued policing operations, whereby the demands of engaging with these spaces securely have escalated. For example, whereas the use of PGP encryption was an optional aspect of engaging with the original Silk Road (Aldridge & Askew, 2017), many markets now mandate the manual encryption of messages by individual users using PGP (Europol, 2021). As a result, learning to use contemporary darknet markets requires a considerable investment of time and effort as well as a high level of technical skill and competence (Kowalski et al., 2019). Kowalski et al. (2019) argue that new users often engage with a hostile community environment when learning how to use darknet markets for buying or selling. They must learn how to use the associated software such as the TOR browser, PGP encryption tools, VPNs, and cryptocurrency tumblers, often without any formal instruction. Moreover, the darknet community presents novice users with an intimidating environment where 'expert' darknet users are disparaging of 'noobs' (new entrants). The authors argue these factors function to deter prospective users who feel that barriers to darknet market engagement are too high and outweigh the advantages of anonymous purchasing and discreet delivery (Kowalski et al., 2019).

In sum, these factors point to the low likelihood that darknet market engagement will become widespread and 'mainstream' anytime soon. Rather it seems likely that these markets will sink deeper into the dark web as the technological requirements of participation continue to increase. To some extent, these challenges are likely to contribute to the rising popularity of social media and messaging apps as an accessible and highly convenient means of buying and selling drugs.

¹ TOR website URLs comprise long, random strings of characters, making it difficult to find the websites manually.

1.1.4 The surface web: Online pharmacies, webshops and apps

Using the internet to buy and sell drugs predates the rise of the darknet markets. For example, during the 1990s, the practice of drug trading via Usenet and Internet Relay Chat (IRC) was documented (Schneider, 2003). Online pharmacies as well as webshops and marketplaces selling novel psychoactive substances (NPS) emerged in the early 2000s (EMCDDA, 2011; Hillebrand et al., 2010). These digital drug markets employed a similar transaction model to the one later used by darknet markets, with buyers making purchases via the website using PayPal or cryptocurrency and products sent via post (EMCDDA, 2011).

The place of these digitally mediated drug markets on the surface web is indicative of the fact they operate in what is often a legal “grey zone” by selling unregulated drugs or substances that are subject to varying legal controls across different country contexts (Koenraadt & van de Ven, 2018). Online pharmacies include legitimate websites offering prescription-only and over-the-counter pharmaceuticals, but many offer a range of counterfeit medicines diverted from other illegal channels such as the darknet (Morelato et al., 2020), as well as unlicensed generic medicines or “lifestyle drugs” like Viagra, weight loss drugs, and steroids (Koenraadt & van de Ven, 2018; Scammell & Bo, 2016). Estimates suggest that approximately 96% of online pharmacies operate illegally, often using social media channels to advertise and direct people to their websites by posting adverts for their products to the comments sections of drug-related videos on YouTube or maintaining Facebook pages (Mackey & Nayyar, 2016).

Marketplaces or independently run webshops selling NPS offer a shifting product range that stays a step ahead of NPS regulatory controls, to ensure they continue to occupy a quasi-legal position in relation to global law enforcement agencies (EMCDDA, 2015; UNODC, 2021b). Categories of NPS commonly sold via these platforms include synthetic opioids, such as analogues of fentanyl and isotonitazene, as well as synthetic cannabinoids and cathinones (UNODC, 2021b). Similar to online pharmacies, social media platforms are often used to advertise products, cultivate a following and direct traffic onto the marketplace of a webshop (UNODC, 2021b). There are indications many of these marketplaces, shops and groups may be ‘closing off’ in terms of their accessibility to outsiders, with the UNODC reporting a rise in reports of password-protected websites requiring registration and membership approval (UNODC, 2021b).

Surface websites and related apps centred around purchasing drugs and drug use have also proliferated, particularly in the United States amid the growing legalisation of cannabis there. Platforms like *Leafly*, (<https://www.leafly.com>), *Weedmaps* (<https://weedmaps.com>), and *eaze* (<https://www.eaze.com>) allow consumers to search and compare cannabis products across local

dispensaries and shops, as well as place pickup and delivery orders (Ramo et al., 2015). This trend links the portability and internet connectivity of the smartphone with drug access along parameters that many people are familiar with as part of their daily smartphone use. But some platforms have faced difficulties in removing unlicensed, black market sellers, highlighting the challenges of separating legal and illegal drug supply (Hussain & Queally, 2019; Leafly, 2018). In countries such as New Zealand, though supply of cannabis for non-medical use remains illegal, there have been media reports of cannabis products like edibles openly advertised on Facebook and Instagram (e.g., Yalden, 2020). Additionally, a recent article by Childs et al. (2022) explores the use of the cannabis website *LeafedOut* (<https://leafedout.com/>) in Australia, which connects local buyers with local black market cannabis sellers via a Google Maps-type interface containing seller locations and contact details. As part of *LeafedOut* transactions, encrypted messaging apps are often used to facilitate contact between buyer and seller and arrange trades (Childs et al., 2022).

Digital drug markets are embedded within a broader setting of digital content and digital communities geared towards drugs, and discussion of best practices around using them safely, or maximising their effects. This broader context is not only likely to influence how and whether digital drug markets are used, but also serves as an important point of access to marketplaces and sellers. Where there is digital drug content, digitally mediated drug supply is often only one step removed.

1.1.5 Broader context: Digital communities and drug content

The proliferation of digital drug content and role of digital communities in sharing information and resources about drug use provide an important backdrop against which digital drug markets develop and evolve. Longstanding harm reduction forums such as *Bluelight* (<https://bluelight.org/xf/>) or digital harm reduction and support resources like *Tripsit* (<https://tripsit.me/>) are increasingly complemented by digital communities on platforms like Reddit (e.g., r/drugs) and groups on social media platforms like Facebook and Discord. These communities may be oriented towards specific drug types such as cannabis or psychedelics, or serve as general spaces where discussion, advice and experiences around drug use can be shared (e.g., Arya et al., 2022; Barenholtz et al., 2021; MacLean et al., 2022; Meacham et al., 2018; Wombacher et al., 2020).

Drug-related content often takes an engaging, relatable, or humorous form. Examples include meme pages on Facebook geared towards drug use experiences, or the creation of profiles

on platforms like Instagram for sharing pictures of cannabis strains or edibles, and the use of Instagram hashtags (e.g., Petersen et al., 2021) or tweets (e.g., Hanson et al., 2013) to post about drug use. Particularly in communities oriented toward drug discussions, using the group to source drugs is often explicitly forbidden (Barratt, 2017). Despite restrictions on member behaviours around sourcing drugs, the connection between these communities, drug-related content and drug access is likely to be considerable given they provide an easy means of targeting groups of people who are likely either (a) interested in buying drugs, or (b) have drugs to sell. On this front, the direct messaging capabilities built into platforms like Reddit and Facebook likely provide an important means of circumventing group restrictions on sourcing behaviours (See also, Barratt, 2017 for discussion relating to the Bluelight forum).

Importantly, the proliferation of digital content and communities based around drug use signals the increasing social and cultural normalisation that exists around the recreational use of drug types such as cannabis, and increasingly also MDMA (e.g., Duff, 2005; Parker et al., 1998). This has also been suggested to be a factor in rising social media drug trading behaviours (See Section 1.3), whereby normalisation feeds into the movement of drug trading from more 'hidden' digital spaces, such as the darknet, onto more mainstream, 'public' surface websites such as social media (e.g. , Moyle et al., 2019) (note that Normalisation is further discussed in Chapter 3, Section 3.1.1 as part of this study's theoretical framework). Among people who use drugs or are interested in doing so, it is increasingly likely that they look for information and resources online and use day-to-day social media and messaging apps to discuss drugs and drug use with friends (George et al., 2019). In turn, the importance of peer groups as sources of drug access, particularly among youth (e.g. , Coomber & Turnbull, 2007), is likely to facilitate a gradual shift to using these same platforms for drug trading.

1.2 Drug use and drug markets in New Zealand

Small population and geographic isolation have historically played an important role in shaping New Zealand's illegal drug market and local patterns of drug use (Wilkins et al., 2017). Drug types like heroin and cocaine, which are more easily available in larger, more central and connected overseas drug markets in the US and Europe, have often been of limited availability and quality in New Zealand (Wilkins et al., 2017). This has also engendered different patterns of availability between those drugs that need to be imported into New Zealand (LSD and MDMA), and those that can be cultivated or manufactured locally (cannabis and methamphetamine) (Wilkins, Romeo, et al., 2018).

Amphetamine type stimulants (ATS) – namely amphetamine, ecstasy and methamphetamine – emerged in New Zealand during the late 1990s, mirroring overseas trends (Aldridge, 2008; Aldridge et al., 2011; Parker et al., 2002). ATS quickly gained popularity locally, displacing LSD and hallucinogens as the second most popular illegal drug class in New Zealand after cannabis (Wilkins et al., 2002; Wilkins et al., 2003; Wilkins et al., 2004). However, a lack of local production meant that ATS like ecstasy and amphetamine (“speed”) remained expensive and difficult to get, facilitating the development of niche local drug use trends involving early NPS stimulants like BZP “party pills” (Sheridan et al., 2007; Wilkins & Sweetsur, 2013). BZP “party pills” were piperazine-based and used to achieve a stimulant-like effect as a legal, cheaper, and more accessible alternative to illegal drugs like MDMA and cocaine (Wilkins et al., 2015). BZP was banned in 2008, and its use rapidly declined as a result (Wilkins & Sweetsur, 2013).

Importantly, the lower availability of stronger stimulants like cocaine paved the way for the rapid spread of methamphetamine use among diverse user groups within the New Zealand population (Wilkins et al., 2004). This rapid increase likely in large part reflected the potential to manufacture this drug type locally. Police seizures of clandestine methamphetamine laboratories peaked in 2006 with the dismantling of 211 laboratories, though seizures have steadily decreased in recent years (see section 1.2.1) (Howell et al., 2018). By the early 2000s methamphetamine was reportedly the second most popular illegal drug in New Zealand behind cannabis, which remains the most widely and frequently used drug among New Zealanders (Newbold, 2016). Whether this is still the case today is less clear (e.g., Ministry of Health, 2022). The representative 2021/22 New Zealand Health Survey (NZHS) placed the prevalence of past-year cannabis use at 15% (610,000) of New Zealand adults, past-year ecstasy/MDMA use at 4% (181,000), and hallucinogens at 2.5% (102,000). The prevalence of past-year methamphetamine use in NZ was just 1% (54,000 adults) (Ministry of Health, 2022). This figure is likely to be an underestimate of methamphetamine use in New Zealand, which is often highest among economically and socially marginalised populations in rural regions that are difficult to access via the NZHS “in person” household survey methodology (Wilkins, Prasad, et al., 2018). Research has also indicated that methamphetamine may be more easily accessible than cannabis in regions such as Northland, Waikato, and Bay of Plenty (Wilkins, Romeo, et al., 2018).

Wastewater testing carried out by the New Zealand Police and ESR (Institute of Environmental Science and Research) consistently indicates much larger consumption of methamphetamine across New Zealand than MDMA or cocaine. For example, in the period from April to June 2022 wastewater testing indicated that 16.7 kilograms of methamphetamine was consumed across the sample locations each week, compared to 8.5 kilograms of MDMA and 0.7

kilograms of cocaine (New Zealand Police & National Drug Intelligence Bureau, 2022) (See Figure 1). The regions with the highest methamphetamine consumption per capita during this time were Waikato, Northland, and the Eastern District (comprising Gisborne and Hawke’s Bay). The large difference in volume between methamphetamine and MDMA is to some extent likely to reflect different frequencies of use and patterns of dosing for these drug types. Methamphetamine is more often associated with frequent, dependent patterns of use, as well as ‘binging’ behaviours, whereby it is taken continuously over a several-day period to sustain a long-lasting, ongoing high (Brecht et al., 2004). In contrast, MDMA is often used less frequently (e.g., monthly, or less), and over shorter ‘sessions’ that typically involve less re-dosing owing to a tendency for the drug to lose its’ pleasurable effects if used too often (Jacinto et al., 2008b; van Amsterdam et al., 2021). This makes it plausible that a smaller group of people may be responsible for the bulk of weekly heavy methamphetamine consumption in New Zealand, while the use of drug types like MDMA has a higher overall prevalence in the population but lower consumption per person.

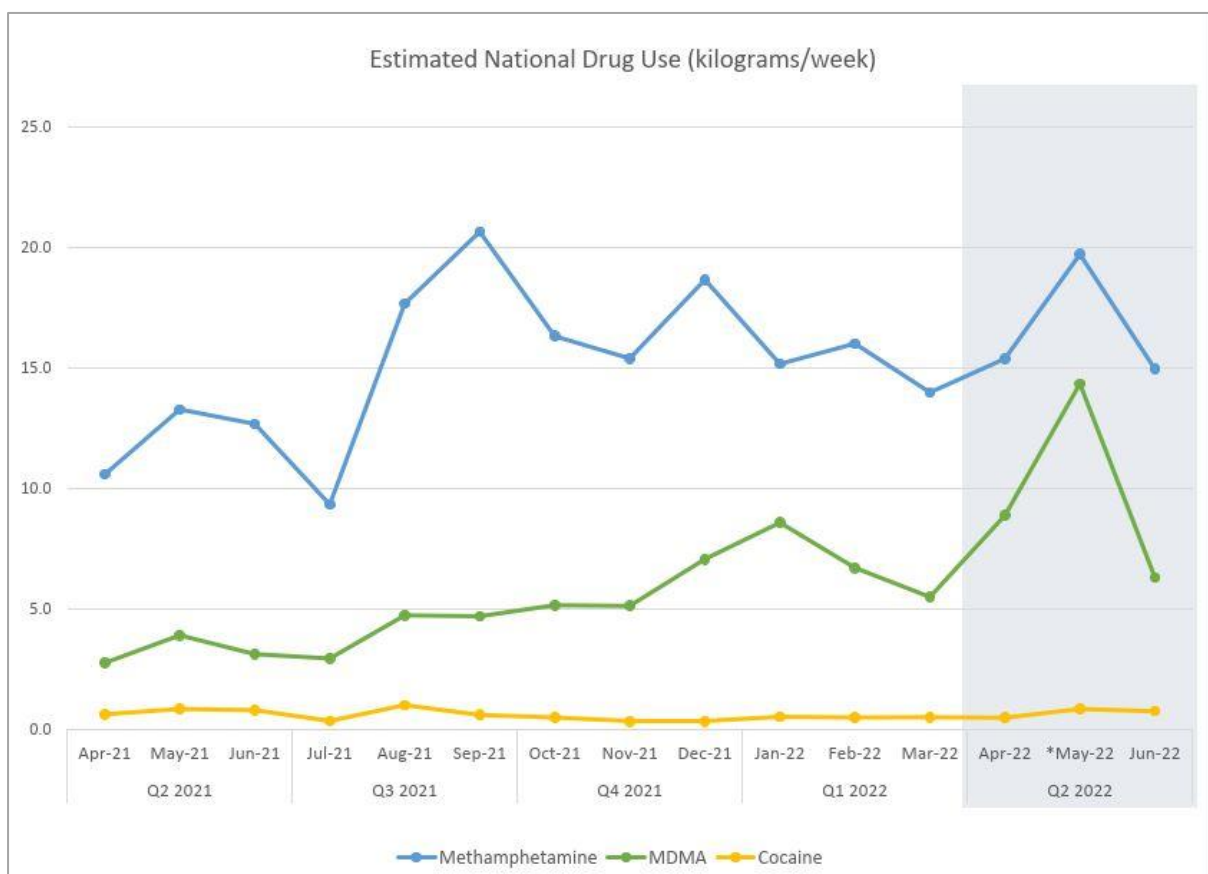


Figure 1: Weekly consumption of methamphetamine, cocaine and MDMA in New Zealand from April 2021 until June 2022. Estimates based on wastewater results. Source: <https://www.police.govt.nz/about-us/publication/national-wastewater-testing-programme-quarter-2-2022>

1.2.1 Drug markets in New Zealand

In-depth analysis of drug market dynamics in New Zealand has historically been limited. Up until the 1980s, cannabis, LSD and heroin were largely imported into New Zealand and sold ‘on the street’ (Newbold, 2016). However, local cannabis cultivation increased from the 1980s onwards, with gang involvement in cultivation operations increasing from the 1990s (Gilbert, 2013; Newbold, 2016). Gang involvement in the local cannabis trade led to the development of so-called ‘tinny houses’ where \$20 amounts of cannabis wrapped in tinfoil, or ‘tinnies’, were sold through a hole in the wall of a gang clubhouse, or later from private residences with an ‘open door policy’ (Gilbert, 2013; Newbold, 2016; Wilkins et al., 2005). The tinny house represents New Zealand’s most emblematic form of ‘open’ drug market (May & Hough, 2004), despite often being based in a private residence (See Chapter 3, Section 3.1.2 for more discussion of open and closed drug markets) (Wilkins et al., 2005). Though principally selling cannabis, they have also been linked to the sale of methamphetamine. Results from the 2016 Illicit Drug Monitoring Survey (IDMS) – a survey of frequent drug users across New Zealand’s three major cities – indicated that of respondents who had purchased methamphetamine in the past six months, 20% had done so via a “tinny house” (N=310) (Wilkins et al., 2017).

Outlaw motorcycle gangs like the Hells Angels and Head Hunters have historically also played an important role in the establishment of methamphetamine manufacture in New Zealand (Gilbert, 2013; Newbold, 2016; Savage, 2020). However, there are indications that local production of the drug is declining across both New Zealand and Australia, amid rising importation from a range of Asian and central American countries (UNODC, 2021a). This is supported by rising customs seizures of methamphetamine and declining seizures of ephedrine and pseudoephedrine-based products (New Zealand Customs Service, 2022). However, this may also indicate a local shift to different methamphetamine precursor substances, or a change in synthesis methods.

Though street drug markets serve as sourcing locations for different drug types such as cannabis, ecstasy/MDMA and methamphetamine in New Zealand, little is known about their size, scope, and dynamics. Large, competitive street drug markets akin to the likes of Kings Cross in Sydney (Coomber, 2015) have not been documented in New Zealand, where a small population may mean this type of large, visible drug market is more difficult to sustain. In 2016, 16% of IDMS respondents who had purchased cannabis in the previous six months had done so from a “street drug market”. This figure fell to 9% for ecstasy/MDMA and rose to 30% for methamphetamine (Wilkins et al., 2017). In contrast, across these three drug types, IDMS respondents most-often

indicated purchasing all three drug types from either a “private house” or an “agreed public location”, indicating that most purchases took place in closed, less visible drug markets (May & Hough, 2004). Wilkins et al. (2004) have suggested this may be particularly true for ATS markets in New Zealand, owing to the higher legal penalties associated with ATS supply, which may have pushed buyers and sellers into more private locations. In this vein, social supply (Further discussed in Chapter 3, Section 3.1.2), which has been documented as a widely used and often preferred method of sourcing drugs internationally, particularly among younger age groups (e.g., Coomber & Turnbull, 2007), is likely also a popular method of purchasing drugs in New Zealand, although it remains under-researched locally (Coomber et al., 2018). For example, across 2016 IDMS respondents, a “friend” was the most common seller type used to purchase methamphetamine (77%), cannabis (82%), and ecstasy/MDMA (80%) in the previous six-months (Wilkins et al., 2017). Researchers have suggested that social supply is likely to be a particularly important avenue for accessing more ‘low risk’ drug types like cannabis (Rychert & Wilkins, 2022).

The emergence of closed-style drug markets in New Zealand mirrors the global shift towards this type of drug market dynamic from the 1990s onwards (Hough & Natarajan, 2000). Globally this shift has been closely tied to the increasing democratisation of access to the mobile phone, which has paved the way for more discreet, flexible texting and calling-based drug market operations (Barendregt et al., 2006; Curtis et al., 2002). The emergence of digitally mediated drug markets as viable pathways to accessing drugs is likely to impact on established drug market dynamics in New Zealand. Digital drug supply channels may provide opportunities for ‘new’ players to enter local drug markets or facilitate novel local drug trading arrangements that may not be viable otherwise.

1.2.2 Online drug purchasing in New Zealand

Online purchasing of drug types like MDMA and LSD may be particularly attractive to New Zealanders because of their fluctuating availability, quality, and price historically. Prior to the emergence of darknet markets, “legal highs” could be bought online via surface webshops (Section 1.1.4) in New Zealand and Australia (EMCDDA, 2011; Sheridan et al., 2007). However, this method of purchasing was not widespread given the convenient availability of many of the same products in local shops such as clothing and liquor stores or dairies (local corner stores) (Sheridan et al., 2007). More recent trends in digital drug purchasing using both the surface and dark web in New Zealand remain largely unresearched. One exception is a Master’s thesis project exploring darknet market purchasing in New Zealand using qualitative interviews with a small sample (N=12)

of local darknet market buyers (Moss-Mason, 2019). The findings indicated the importance of the darknet market as a means of circumventing the traditional constraints of New Zealand's local drug landscape by providing access to both a broader range of drug types as well as lower prices and better 'quality' (Moss-Mason, 2019). Several of the study participants sourced drugs via darknet markets for local resale purposes, highlighting the potential for this type of online supply channel to reach a broader user base via established local networks. Moreover, since 2018, a New Zealand domestic darknet market has emerged (Wilkins & Rychert, 2022). Tor market grew considerably in 2022 and now also hosts international vendors. However, a significant proportion of the market is still geared towards servicing a growing domestic darknet drug trade (Wilkins & Rychert, 2022).

There are other indications that digital drug purchasing, via the darknet or otherwise, is increasing. For example, IDMS findings also indicate a gradual increase in the numbers of respondents reporting the purchase of cannabis, methamphetamine, and ecstasy (MDMA) via "the internet" from 2009 to 2016, as shown in Figure 2 below (Wilkins et al., 2017). Furthermore, media reports frame darknet and online drug purchasing as "increasingly common" among New Zealanders (e.g., Hurley, 2018; McNeilly, 2015; Roxburgh, 2022). Similarly, media reports of people arrested for the import or sale of drugs on darknet markets have also increased (e.g., Hurley, 2018; Kidd, 2018). Regarding social media drug markets specifically, a handful of media articles provide insight into this trend locally (Dillane, 2019; McKenzie, 2020; Tantau, 2018). These anecdotal reports suggest that social media drug trading in New Zealand is growing in popularity (Dillane, 2019).

Data from New Zealand customs also shows a general upward trend in the number of drug seizures at New Zealand's border, particularly via mail centres (See Figure 3) (New Zealand Customs Service, 2022). This is an imperfect indicator of increasing online drug purchasing owing to the connection between the number of seizures made and policing intensity, which has likely increased in recent years alongside local law enforcement response to the digitally mediated drug trade. But it does provide evidence in support of what is likely to be the increasing frequency of smaller drug amounts shipped via the postal service in keeping with the 'traditional' darknet market transaction model. This trend is particularly pronounced for MDMA (ecstasy), which is likely to be an appealing drug type to purchase via darknet markets among New Zealanders owing to its fluctuating local availability, quality, and high price. From 2011 until June 2022, NZ Customs made a total of 3,893 seizures of MDMA at New Zealand mail centres, in contrast to only 253 other types of MDMA seizure (e.g., customs-controlled area seizures, such as ports, storage facilities,

and export warehouses). Mail centre seizures for MDMA increased markedly from early 2016 onwards but have fallen since late 2019 (New Zealand Customs Service, 2022).

These factors provide indications that darknet drug supply likely represents a notable undercurrent feeding into New Zealand's domestic drug market. In this vein, darknet drug supply may help to fill the historical gaps in local drug availability that exist in New Zealand. This has similarly been illustrated in the Australian context, with the development of a thriving domestic darknet market for methamphetamine, as mentioned in Section 1.1.2 (Broséus, Morelato, et al., 2017; Cunliffe et al., 2017). In this case, local Australian vendors provide buyers with access to methamphetamine at lower prices and an ability to avoid participating in a high-risk offline drug market context (Cunliffe et al., 2017). However, the intricacies and challenges to widespread adoption of darknet markets (Section 1.1.3) are likely to mean that the potential for this digital drug supply channel to impact on local drug accessibility is tied into the use of more mainstream technologies that are better suited for connecting buyers and sellers in local drug markets. Additionally, it may be that social media drug markets can similarly offer people who use drugs in New Zealand potential avenues through which to address lack of drug supply within their own networks without having to engage with the complexity of darknet market transactions.

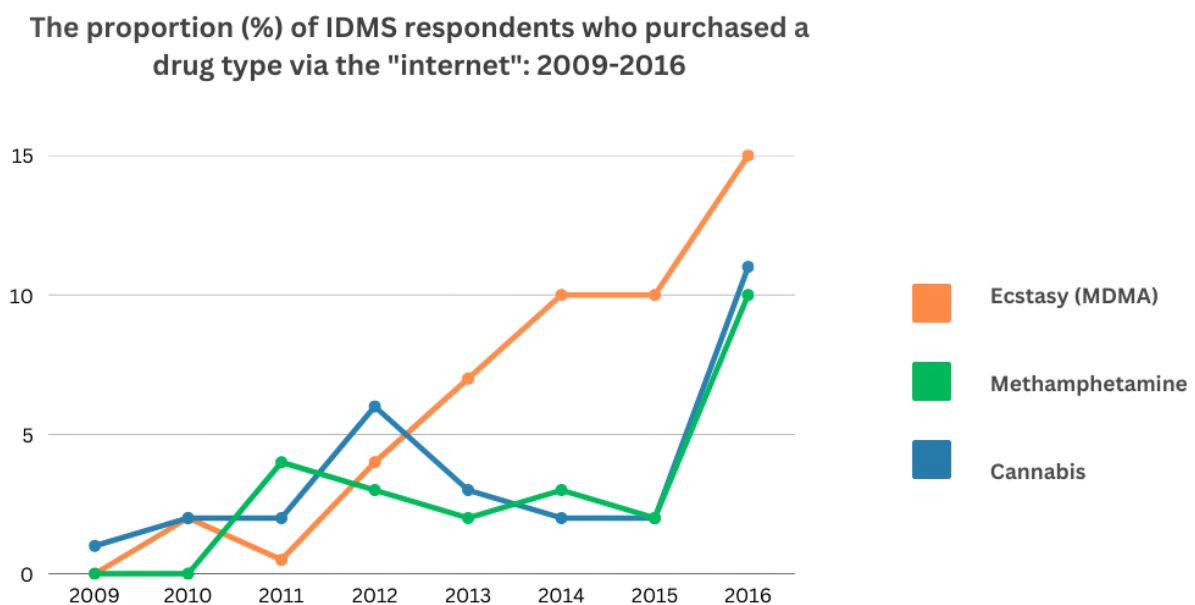


Figure 2: The proportion of IDMS respondents indicating the use of an "internet" location to purchase ecstasy, methamphetamine, or cannabis in the past six-months from 2009 until 2016. Source: Wilkins et al. (2017)

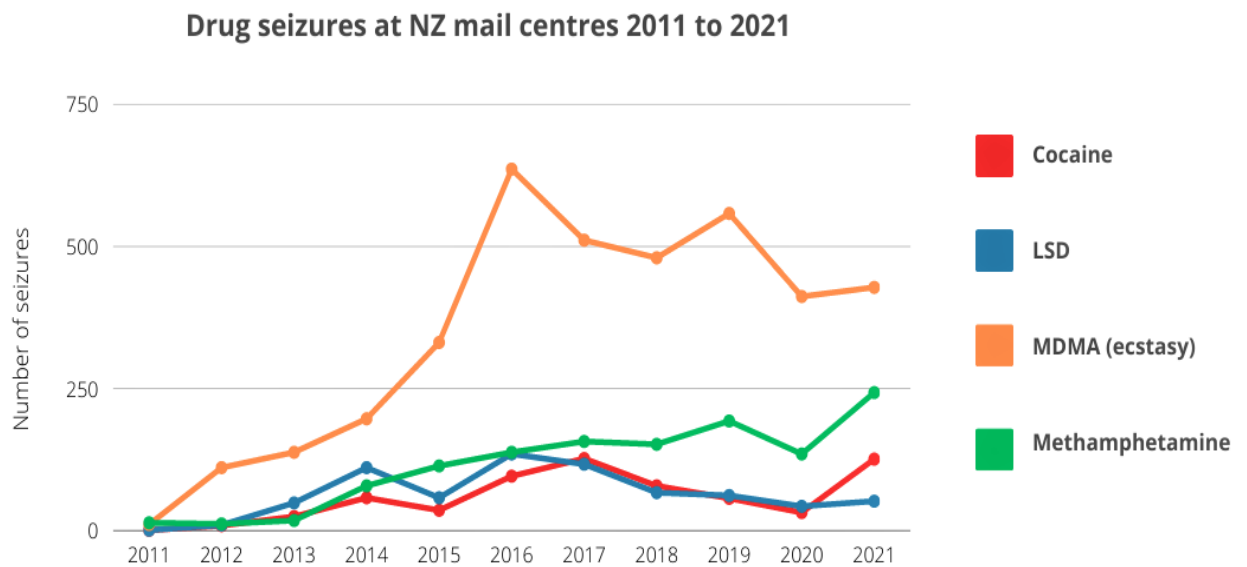


Figure 3: Drug seizures at NZ mail centres for four drug types that are commonly imported into New Zealand: Cocaine, LSD, MDMA and methamphetamine. Based on reported data of drug seizures from NZ Customs. Source: <https://www.customs.govt.nz/about-us/statistics/drug-interceptions/drug-seizures/>

1.3 Social media drug markets: Current research

There is currently a small but growing body of research literature on the use of social media and encrypted messaging apps for drug trading internationally. Moyle et al. (2019) have presented the first exploration of social media drug markets using a combination of online survey data (N=358) and face-to-face interviews (N=20) with people who had both used and *considered* using apps to purchase drugs internationally. Their online survey sample is comprised largely of respondents from the US, Australia, Canada, and the UK, while interviews were carried out solely with Australian social media drug market buyers. Among the survey respondents who had purchased from social media in the past (n=222), Snapchat was the platform most often used to access drugs (76%), followed by Instagram (48%) and Wickr (37%), though the results also highlight regional and country-specific variation in the popularity of different platforms for drug purchasing. Most respondents used social media to purchase cannabis, LSD, and MDMA/ecstasy. Though it is technically possible to use the platforms to facilitate international drug access, the authors found that a clear majority of their survey sample had used social media platforms to connect with *local* sellers (Moyle et al., 2019). In keeping with this finding, research has found that drugs are often sold in smaller amounts in social media drug markets (Blankers et al., 2021). Moreover, some drug

types like cocaine may be more expensive when purchased on social media platforms in comparison to darknet markets, as buyers pay a premium for fast transaction speed (Moeller et al., 2021).

The findings reported by Moyle et al. (2019) lay a foundation for further exploration of social media drug markets by identifying important advantages, disadvantages, and potential implications and complexities of engaging with these platforms. They place social media drug markets as a useful 'intermediary' option that streamlines many of the complexities of engaging with darknet markets through a familiar, easy-to-use communication channel while facilitating convenient, high speed drug access and easy contact with sellers and buyers. However, they also highlight possible points of concern around the use of social media and messaging apps for drug trading. Examples include mistaken perceptions of platform security and safety concerns around purchasing drugs from strangers, given a lack of platform or app features that help to signal seller trustworthiness (Moyle et al., 2019).

In the UK, these findings are complemented by a detailed report compiled by the independent drug policy thinktank Volteface (McCulloch & Furlong, 2019). Volteface researchers polled a large sample of UK 16–24 year-olds (N=2,006) on their engagement with social media drug markets, alongside the use of focus groups (N=4), interviews (N=24) and observational data collection. Their findings indicate that despite the emergent nature of social media drug markets, 24% of their polled sample had seen drugs advertised on social media. The majority had seen this content on Snapchat (56%), and largely in relation to cannabis products (63%), although cocaine, MDMA and pharmaceuticals were also often seen advertised. The authors emphasise the range of ways sellers can advertise on social media (e.g., posts, profiles, stories), while buyers can easily connect with sellers by searching, following, messaging, or commenting under drug adverts posted on social media platforms like Instagram. Correspondingly, they raise concerns around the easy accessibility of different drug types and commercial sellers on social media, and the ways in which 'routine' exposure to drug adverts as part of social media engagement may normalise drug use among younger age groups (McCulloch & Furlong, 2019).

Another important area of emerging research comes from Scandinavia, where researchers have explored how social media platforms are being used to sell drugs across Denmark, Sweden, Finland, Norway and Iceland using digital ethnography and semi-structured app-based anonymous interviews with social media sellers (N=107) (Demant et al., 2020; Demant et al., 2019). Demant and colleagues (2019) found that the size and shape of social media drug markets in Denmark, Sweden, Iceland, Norway, and Finland varied considerably. They contrasted

the use of largescale drug selling groups on Facebook with the use of Snapchat and other messaging applications like Wickr. In the former, buyer and sellers were often strangers, with the groups functioning as a means for sellers to advertise and connect with buyers in competitive market environments (Demant et al., 2019). Messaging apps such as Wickr or Snapchat tended to be used for drug trades between two people, or in contexts where the buyer and seller were more familiar with one another (See Chapter 3, Section 3.1.2) (Demant et al., 2019). Their findings provide valuable evidence of the changing shape and dynamics of social media drug markets across different country contexts, building on indications of similar dynamics found by Moyle et al. (2019). Different country contexts could lead to variation in how the same platform was used to facilitate drug trading, as was the case in relation to the use of Facebook across Denmark, Sweden and Iceland. Platforms that were widely used in one country were sometimes not used at all in others. For example, the widespread use of Facebook and Messenger in Denmark, Sweden and Iceland was largely absent in Norway and Finland. In Norway, the use of encrypted messaging apps like Wickr was more commonplace, while in Finland sellers appeared not to use social media for drug transactions at all, opting to use the local darknet market (Demant et al., 2019).

The Scandinavian project provides broad insights into the potential impacts of social media drug markets on established drug trading dynamics. The findings support suggestions by McCulloch and Furlong (2019) that social media drug markets are likely to make commercial sellers more accessible to younger age groups, pre-empting a potential shift away from social supply, and an exacerbation of the normalisation of drug use among these age groups (Demant & Bakken, 2019; Demant et al., 2019). Additionally, they indicate the potential for selling group environments to bring together what may have previously been more discreet groups in local drug markets, facilitating a mixing of commercial and casual seller types. In turn, this is likely to make it easier for younger age groups to 'drift' into drug selling (Demant et al., 2020).

The easy access characteristic of social media drug markets may place more vulnerable young people at greater risk of experiencing drug harm and dependency. Indeed, Moyle et al. (2019) suggest that the heightened climate of drug accessibility around many social media drug trades may facilitate a 'supply gateway' effect (Aldridge et al., 2018) as the range of drug types easily available to younger age groups is considerably broadened. In the United States, the accessibility of counterfeit benzodiazepines and opioid painkillers via social media platforms like Snapchat, has led to the accidental overdose deaths of several young people after purchasing these products (Hoffman, 2022; McCormick, 2021). Oksanen et al. (2021) report that among young people who purchased drugs online (social media or darknet) in the US and Spain, most used social media to do so. The authors also link digital drug purchasing to several risk factors for

the development of substance use issues, such as high impulsivity and mental health issues (Oksanen et al., 2020; Oksanen et al., 2021).

More recent scholarship has focused on applying criminology, sociology, and communications theory to the phenomenon of social media drug markets. Haupt et al. (2022) examine how sellers use social networking site (SNS) affordances like message length to advertise drugs across different platforms. Their findings indicate the possibility that sellers use different SNS platforms to target particular user groups based on the demographic traits more often associated with certain platforms (e.g., gender, age) and the general platform 'culture' around drug-related content (Haupt et al., 2022). From a different perspective, Bakken (2020) use signalling theory to analyse how Facebook sellers shape their anonymous Facebook profiles to communicate their local drug market 'position' and increase their chances of appealing to certain types of buyers. Bakken et al. (2022) extend this argument in a study exploring how social media selling increases the importance of digital capital as a valuable drug selling asset. Digital capital describes the differing extents to which people can leverage digital technology to extract or generate capital resources, or achieve their goals (Park, 2017). The findings from Bakken et al. (2022) show that social media sellers need to know how to market themselves without giving away their identity, be aware and knowledgeable about evolving online 'code' using emojis to advertise different drug types and have the skills to navigate different social media platforms and use their features to protect privacy. The authors argue that the importance of digital capital in social media drug markets can be seen as democratising drug market entry and reducing the significance of more 'traditional' forms of drug market capital such as sub-cultural or 'street' capital (Bakken et al., 2022). The lowered value of social capital in these environments ties into an argument made by Moeller (2022) that social media drug markets can be characterised as more "market-driven" than "network driven" in terms of their transaction dynamics. This categorisation means that social media drug markets may be less dependent on established sub-cultural ties, and more closely tied to competitive local drug market dynamics characterised by choice, immediacy, and opportunity.

Social media drug markets may often be used in combination *with* other forms of online drug markets. For example, Demant et al. (2019) found that many sellers on social media purchased their stock off the darknet. Alternatively, in keeping with overarching trends in the darknet market landscape discussed in Section 1.1.4, darknet vendors appear to be increasingly encouraging buyers to make "direct deals" via encrypted messaging channels such as Telegram and Wickr to avoid darknet market fees (Childs et al., 2020). Not only are different digital technologies used to complement one another, but they may also give rise to novel drug market

hybrids. Barratt et al. (2021) explored the use of Televend, a hybrid trading platform combining features of the darknet market and direct messaging apps. Buyers use the Telegram interface to purchase from vendors who use a darknet ‘backend’ to run a sales channel and a ‘shopbot’ interfaces between the two parties. Though Televend has since shut down, it provides a notable indication of the types of digital hybrid marketplaces that may become more common in the future. This forms part of what Demant et al. (2020) suggest is the potential for the fluidity of digital technology, with particular emphasis on social media, to increase the overall resilience and adaptability of drug markets more broadly.

1.4 Research gaps and the contributions of the current study

The relatively recent emergence of social media drug markets means there are significant gaps in understanding of these markets. This study is principally concerned with three of the current research gaps, as follows:

1. Contextualisation of the social media drug markets phenomenon in New Zealand

At a foundational level, there remains a lack of research on digitally mediated drug markets in New Zealand and, more broadly, in-depth consideration of local drug market transaction dynamics. These research gaps are likely to be increasingly interrelated and overlapping owing to the central role digital technology plays across different facets of day-to-day life. In short, digital and non-digital drug markets are likely to be increasingly interwoven with one another (e.g., Sogaard et al., 2019). What appears to be the largely local nature of much social media drug trading makes it a valuable means of contextualising the overlap between digitally and non-digitally mediated drug markets in New Zealand. Social media drug markets are likely to be tied into a broader context of ‘online’ drug supply, as well as shaped by and shaping of local, physical drug market transaction dynamics. This intersection is important given the variation in social media drug markets reported in extant literature (Demant et al., 2019; Moyle et al., 2019). As discussed in Section 1.2, geographic isolation and a small population have played a significant role in New Zealand’s drug market landscape, impacting on the availability of different drug types and likely also shaping dominant drug trading dynamics, giving rise to drug selling venues such as tinny houses. It may be that New Zealand’s unique drug landscape results in similarly unique trends in social media drug trading. In turn, this is likely to have knock on effects on local patterns of drug accessibility, availability, and drug experimentation. Conversely, the global reach of social media platforms such as Facebook, Instagram and Snapchat, and the accessibility and spread of digital content, may mean that trends in social media drug trading in New Zealand mirror patterns

already identified internationally, perhaps increasing the resemblance between New Zealand's drug landscape and those of other countries. This is significant considering the arguments that social media drug markets may make commercial seller types more accessible to younger age groups and exacerbate normalisation. Understanding social media drug purchasing as it exists in New Zealand will provide a knowledge base to inform local policy and harm reduction strategies.

This thesis provides the first in-depth exploration of social media drug markets in New Zealand. My aim is to contribute both to local understanding of social media drug trading practices, as well as understanding of how these spaces may vary across different countries.

2. *Exploration of the role of social media and messaging apps in facilitating 'less-commercial' drug market dynamics such as social supply*

The literature presented in Section 1.3 deals almost exclusively with more commercial social media drug markets involving transactions between strangers in what are often more competitive, anonymous digital environments. Indeed, though social media drug trading may make commercial sellers more easily accessible to younger age groups, questions emerge around whether this will impact on the historical importance of social supply behaviours as a primary source of drug access among younger age groups. While social media drug trading in closed or socially networked drug markets has been reported (Bakken & Demant, 2019; Demant et al., 2019), contextualisation of social supply on social media is still lacking. This is notable given how prolific social supply appears to be as a source of drug access in New Zealand and abroad. Additionally, connecting with friends remains a primary driver of social media engagement globally (See Chapter 2). This makes it highly likely that these platforms now increasingly serve as an important conduit of social supply behaviours. Contextualisation of this type of social media drug market dynamic is important given that the attributes of the social media environment (See point 3 below) may also reshape or alter social supply behaviours. Arguably, without an understanding of how these less-commercial forms of drug supply may be taking place on social media, our ability to map the impacts of social media drug markets, particularly on younger age groups, is limited.

This thesis presents an exploration of both more and less commercial social media drug market dynamics in the New Zealand context. In doing so it contributes to a richer and more nuanced understanding of how social media drug markets may be impacting drug purchasing and trading behaviours among younger age groups, informing debates on the broader consequences of this global trend.

3. *Contextualisation of how social media drug market dynamics may be influenced by a broader, non-drug related context of social media engagement using communications and social media scholarship and theory*

From a broader perspective, the emergence of social media drug markets gives rise to questions around the complexities and nuances of using these platforms for drug trading. Social media are not specifically designed to facilitate drug transactions, a factor that differentiates the resulting drug markets from other forms of digitally mediated drug market (Section 1.1). Moreover, the centrality of these platforms to people's day-to-day lives means that buyers and sellers are likely to engage with social media across a range of contexts, and for a range of purposes unrelated to drug trading. In turn, these factors may have a significant impact on how these platforms ultimately come to be used as drug markets. As discussed in Section 1.3 there is currently only one study approaching social media drug markets from a communications perspective, and it uses affordance theory (See Chapter 3, Section 3.2.1) to analyse how platform features impact on seller advertising behaviours (Haupt et al., 2022). Among studies approaching social media drug markets from a more criminological perspective, Moyle et al. (2019) touch on some of the unique issues and challenges social media drug trading may present for buyers and sellers (e.g., misinterpretation of platform security features). Similarly, Bakken et al. (2022) explore digital capital among social media sellers and buyers, highlighting the importance of alternative types of buying and selling 'skills' to navigate social media drug trading. These studies provide some evidence of the ways the broader context of social media engagement likely influences how drug trading takes place across platforms and may facilitate behavioural adaptations on the part of buyer and seller. However, equally they also explore social media drug markets predominantly through the lens of one field of scholarship: communications, or criminology. Though this is valuable, it is likely the intersection between people's engagement with social media and messaging apps as part of their day-to-day lives and their use of them to facilitate drug transactions leads to additional nuances and complexities that have not yet been explored in depth by researchers. Similarly, structural elements of the social media landscape such as user data collection practices are also likely to be consequential when it comes to the use of social media and messaging apps for illegal drug trading, given the challenges they pose to user privacy more generally (Chapter 2). As a result, it seems particularly important to consider social media drug markets from a more interdisciplinary perspective to understand how the unique context and constraints posed by illegal drug trading are adapted to social media and messaging apps. Moreover, this perspective also acknowledges that a broader, non-drug related social media landscape affects how these markets take shape and how people engage with them. This thesis

therefore draws on social media and communications literature and theory to inform the contextualisation of project findings. (See Chapter 2 for literature review on social media and communications scholarship; And Chapter 3, Section 3.2 for relevant theoretical concepts).

The interdisciplinary perspective on social media drug markets presented as part of this study forms the third contribution of this research to current academic understanding of social media drug markets. In drawing on social media and communications scholarship and theory alongside drug market and criminology literature, this project presents a necessary and important contextualisation of how the broader social media context may influence and alter drug trading practices.

1.4.1 Project aim and structure

The overall aim of this project is to explore the use of social media and messaging apps to buy and sell drugs in New Zealand. The approach taken to addressing this aim involves two interconnected lines of inquiry.

Firstly, this project starts with an emphasis on establishing the parameters of social media *drug markets* in New Zealand. By this, I mean that focus is placed on contextualising New Zealand social media drug trading in relation to: (a) existing findings from international literature on social media drug markets and online drug markets generally (Section 1.3); (b) the specifics of drug accessibility, and drug markets in New Zealand (Section 1.2); and (c) drawing on a drug market theoretical framing (Chapter 3, Section 3.1).

Secondly, in Chapters 7 through 9, though I continue to tie study findings into the drug market literature, I place more emphasis on the broader *social media* context in which social media drug trading ultimately takes place. This forms the second analytical thread used to frame research findings. From this perspective I explore how broader, non-drug related contexts of platform engagement and trends in the social media landscape (e.g., user data collection) may act as additional, important shaping mechanisms on social media drug trading in New Zealand. In keeping with this focus, I draw more heavily on the social media and communications literature (Chapter 2), and related theoretical concepts (Chapter 3, Section 3.2). These two project threads are then pulled together and interwoven in Chapter 10, which presents the discussion and conclusions.

Figure 4 below illustrates the relationship between subsequent findings chapters, research questions and the research objectives presented in Section 1.4. The fourth column indicates additional objectives addressed by each findings chapter besides a “primary” objective.

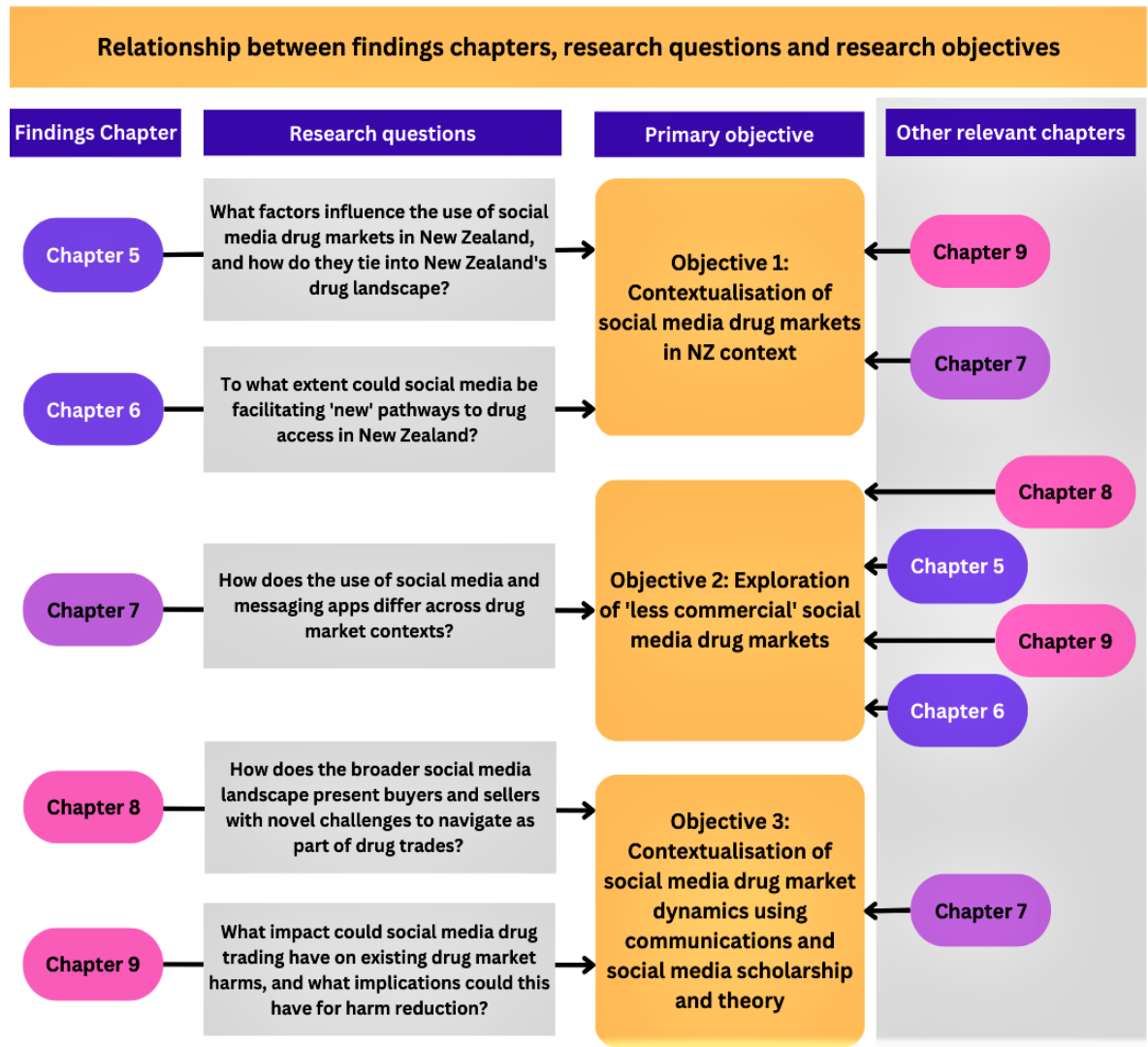


Figure 4: Relationship between findings chapters, research questions and research objectives.

1.4.2 Outline

The structure of this thesis is as follows. As aforementioned, Chapter 2 presents a literature review on social media and messaging apps. As part of this chapter, I set definitional boundaries around how social media is framed in this project and signpost different areas of social media and communications research that will be drawn on in subsequent findings chapters. Following on from this, I present the theoretical framework for this project in Chapter 3. This chapter presents an in-depth discussion of the diverse drug market, social media and communications concepts drawn on throughout the findings chapters and discusses research epistemology. Chapter 4 details

the project methodology. Focus is placed on detailing the mixed methods approach taken, and the process of recruiting, carrying out and analysing anonymous message-based interviews. Throughout this chapter, I write from a 'researcher's voice' (e.g., Whitaker & Atkinson, 2021) perspective, thereby reflecting on some of the complexities of the methodological approach taken and my own role as the researcher.

Chapter 5 presents the first study findings. This chapter acts to 'set the scene' for subsequent chapters by exploring how social media drug markets are located within New Zealand's broader drug landscape, using data from the New Zealand Drug Trends Survey (NZDTS). In Chapter 6, the first of the qualitative papers presented in this study, I explore the use of Discord drug servers in New Zealand. This emerging local social media drug market trend was the subject of several media reports prior to and during the data collection period for this study, due to its rising popularity and association with robberies and alleged 'gang members' (Cornish, 2020). Chapter 6 explores the advantages, challenges, and tensions of this social media drug market trend, drawing on both interview and observational data.

Chapter 7 uses interview data to consider how the use of different social media and messaging platforms for drug trading may be 'tied' to particular drug market contexts and seller types. To explore this question, I analyse how the act of 'choosing' a particular platform for drug trading differs across drug market contexts and may be particularly complex to navigate in social supply settings. Chapter 8 explores how risk perceptions around exposure to law enforcement may be linked to broader perceptions of the potential for digital surveillance on social media. This focus provides a stepping stone into a discussion of the challenges of maintaining privacy and making judgements around platform security in relation to social media drug trading behaviours. Finally, Chapter 9 presents an in-depth consideration of the potential for expanded social supply on social media, and in turn an expanded ability to leverage many of the harm reduction benefits often attributed to this drug trading dynamic. Using interview data, I explore how the drug trading context in which social media features such as public profiles and visible friends' lists are used may impact the potential for harm within local drug market environments.

Concluding the thesis, Chapter 10 presents the discussion and conclusions of this study. I draw on the findings and discussion presented as part of each chapter, literature and theoretical concepts to synthesise results and findings more broadly. As part of this chapter, I outline the implications of study findings for future policy responses to drug markets in New Zealand, and the contributions this research makes to existing understandings of drug markets, both on social

media and more broadly. Lastly, I discuss study limitations, and outline directions for future research.

Chapter 2: Social media platforms and messaging apps

The ubiquity of social media and messaging apps globally, and their function as a means of connecting with others makes their adoption for drug trading unsurprising. In fact, one of Moyle et al.'s (2019) interview respondents described using social media drug markets as akin to “*moving with the modern world*” (p. 106). However, the extent to which social media and messaging apps are ‘taken for granted’ as part of people’s daily lives may also mask what is ultimately their social, economic, political, and cultural complexity (Van Dijck, 2013). The place of drug trading behaviours within this broader digital context is therefore noteworthy and raises important questions around how drug market and social media contexts combine, and what implications this may have.

The chapter begins with an overview of contemporary social media and messaging apps (Section 2.1), which is used to frame subsequent presentation of ‘social media’ as defined and applied in this project (Section 2.1.1). In Section 2.2, I consider trends in engagement with social media platforms and messaging apps to discuss important international and local patterns. From here, more specific areas of the literature are discussed. Section 2.3 presents a discussion on the centrality of social connection to social media engagement, highlighting important differences between platforms that then feed into the findings Chapters 6, 7 and 9. Lastly, Section 2.4 reviews the literature on social media privacy and surveillance. This section is broken down into two subsections, the first of which presents literature on individual privacy concerns stemming from the sharing of personal information on social media (Section 2.4.1). Section 2.4.2 discusses the collection of user digital trace data by social media companies and how this is tied into a larger global data trade where different data sources are bought and sold for use across the public and private sectors. This last section provides important context for framing the findings and discussion presented in Chapter 8.

2.1 The contemporary social media and messaging app landscape

First emerging in the early 2000s as part of the ‘web 2.0’, which heralded a more democratised and participatory internet (Anderson, 2007; Murugesan, 2007), social media is generally characterised by its facilitation of the creation, sharing and altering of user generated content (UGC), and connections with online others (e.g., Kaplan & Haenlein, 2010). Though all social media platforms facilitate social interaction through UGC, they do so in different ways, shaping the types of social connections that can be made (See Section 2.3). For example, SNSs such as Facebook and LinkedIn allow people to construct public profiles and connect with others, making their aggregated connections visible² in the form of a digital social network (boyd & Ellison, 2008; Donath & boyd, 2004). Alongside the SNS, other forms of social media like “meta communities” (e.g., Reddit) are formed around the ability to interact anonymously with news and digital content created by others (Moore & Chuang, 2017). Twitter is often described as a social ‘broadcasting’ or ‘micro-blogging’ site owing to the shorter character limit on tweets, and the way that tweets are dispersed across the platform’s userbase, unrestricted to particular social networks (Murthy, 2018). Instagram is an example of an ‘image-based’ social network where connections are mediated through visual content such as photos and videos, and which often extend beyond a person’s immediate social networks (Lee et al., 2015).

A parallel current to the development of social media has been the rise of instant messaging and its integration with the smartphone via messaging applications (apps) from the late 2000s with the launch of WhatsApp in 2009 (e.g., Church & De Oliveira, 2013; Matassi et al., 2019). With internet connectivity becoming more widespread alongside smartphone ownership, instant messaging has become more attractive as it circumvents many of the drawbacks of texting, such as limits on the number of characters and message length, as well as the financial cost of sending text messages (Church & De Oliveira, 2013). In recent years, the number of available messaging apps has increased, particularly what can be broadly termed ‘privacy-centric’ apps such as Telegram, Signal and Wickr. These messaging apps offer their users a more secure environment in which to talk to others, including features such as end-to-end encryption, message timers and anonymous sign up (Versus, 2022; Williams, 2022). As discussed in Section 1.3, by virtue of their security features, these platforms have become linked to social media drug trading internationally (Blankers et al., 2021; Demant et al., 2019; Moyle et al., 2019).

² Contemporary SNS platforms are more nuanced in how they allow users to control the visibility of their profiles and personal information to others (e.g., privacy controls on Facebook).

Though contemporary social media and messaging apps are diverse, they are also characterised by changeability (Van Dijck, 2013) and convergence (Jenkins, 2006). Here, convergence refers to how platform functionalities and features increasingly overlap, whereby the same action can often be performed across different platforms (Jenkins, 2006). One such example is the spread of instant messaging capabilities as an in-built feature across different social media platforms. *Within* the realm of messaging apps, features such as message timers can increasingly be utilised across platforms, such as in the form of secret chats on Messenger (Meta, 2023a), or by modifying chat settings on WhatsApp (Meta, 2023b). Additionally, an increasing range of platforms facilitate the posting of ‘stories’ – video or pictures available to view for 24 hours – originally pioneered by Snapchat, stories now also feature on Facebook, Instagram, WhatsApp, and more recently Signal and Tik Tok as well (Gallagher, 2018; Hern, 2017; Hughes, 2022; Malik, 2022). Stories on both Snapchat and Instagram been linked to the advertising of drugs on social media (e.g., McCulloch & Furlong, 2019). As such, the presence of both message timers, and stories across numerous platforms highlights the flexibility and generalisability of different advertising strategies across apps.

Convergence between platform features is a symptom of another broad trend characterising the contemporary social media landscape, which has been described as the rise of “platform-as-infrastructure” (Helmond et al., 2019) or ‘platformisation’ (Helmond, 2015). Helmond (2015) defines platformisation as “*the rise of the platform as the dominant infrastructural and economic model of the social web and the consequences of the expansion of social media platforms into other spaces online*” (p. 5). At a broad scale, this dynamic relates to the expansion of “the big 5” digital tech corporations – Apple, Microsoft, Alphabet (Google), Meta and Amazon Web Services – towards an end-goal of “*becoming the operating system for our lives*” (Vaidhyanathan, 2021 p. 101). Linking this back to social media, Helmond argues that the platformisation of Facebook has effectively transformed it from an SNS, as discussed above, into a social media *platform*, whereby the streamlined programmability of Facebook’s application programming interface (API) facilitates integration of Facebook infrastructure across different third-party sectors and online spaces (e.g., integration of Messenger capabilities on a business website, or a ‘share to Facebook’ icon on a non-social media website) (Helmond, 2015; Helmond et al., 2019; Nieborg & Helmond, 2019). This is further evidenced by Meta’s launch of Messenger as a separate mobile app (2011), and its subsequent acquisition of Instagram (2012) and WhatsApp (2014) (Vaidhyanathan, 2021). The dominance of Instagram, WhatsApp, and Facebook as social media and messaging platforms globally (See Section 2.2) makes it very difficult for

people to 'leave' Meta's platform landscape due to its position as "*the core 'social infrastructure' of the web and mobile ecosystems*" (Nieborg & Helmond, 2019 p. 211).

The rise of social media *platforms* as opposed to discreet websites is significant to this research largely because it means that a focus on discreet social media *websites* and messaging *apps* oversimplifies the contemporary social media landscape. In turn, this is likely to have implications for social media drug markets, which form part of a digital landscape that is much broader, deeper, and more interconnected than it may appear.

2.2.1 Defining social media

The fluidity and diversity of the social media landscape has made defining contemporary 'social media' difficult (e.g., Carr & Hayes, 2015; Howard & Parks, 2012). Adopting a broad definition that encompasses the centrality of UGC and social connection to the social media concept, this thesis defines social media as:

...web-based services that allow individuals, communities and organizations to collaborate, connect, interact and build community by enabling them to create, co-create, modify, share and engage with user-generated content that is easily accessible (McCay-Peet & Quan-Haase, 2016, p. 6)

I refer to "social media *and* messaging apps" throughout the presentation and discussion of findings. I make this distinction to acknowledge that messaging apps are often used in the service of one-to-one as well as group-based communications (Ling & Lai, 2016). In this vein, they afford a greater level of flexibility in how they are adopted to serve social connection, interaction, and community building than social media platforms like Facebook. Additionally, instant messaging is often regarded as sharing a historical proximity to SMS/texting (e.g., Church & De Oliveira, 2013), which means it can be viewed as having a logistical function as a "taken for granted" communications medium (Ling, 2012) in comparison to interactive, feature-rich social media such as Instagram.

Appendix B presents additional detail on the principal social media and messaging apps discussed as part of this thesis.

2.2 Trends in social media and messaging app engagement

Social media and messaging app engagement continues to rise globally. The report Digital 2022, published by a group of digital engagement analytics firms, indicates that as of January 2022 more than 4.6 billion people globally were making use of some form of social media (We Are Social & Hootsuite, 2022). A large share of engagement with social media takes place via smartphone. For example, in 2022 82% of Facebook's advertising audience aged over 18 *only* used a mobile or smartphone to access the platform (We Are Social & Hootsuite, 2022). Globally, people also increasingly hold accounts for a range of social media and messaging apps. The global average number of accounts held by an individual social media user in January 2022 was 7.5 (2022).

Patterns of social media engagement vary between age groups (e.g., Duncan, 2016; Pew Research Center, 2018). For example, longstanding, popular platforms such as Facebook, YouTube, and WhatsApp continue to account for the largest share of global social media use (Social & Hootsuite, 2020b; We Are Social & Hootsuite, 2022). But a recent report from the Pew Research Centre in the US suggests that teenagers may be turning away from more established platforms towards newer platforms such as TikTok (See Figure 6) (Vogels et al., 2022). TikTok is an interactive social media platform centred around short-form videos that can be creatively and easily edited by users. Like Instagram, users can follow TikTok creators (Vaterlaus & Winter, 2021), but the platform is particularly famed for its personalised 'for you' page, which uses algorithms to target content to user interests (Hern, 2022a). The use of platforms like Instagram and Snapchat is also concentrated among younger age groups, who display lower levels of Facebook use than older generations (Pew Research Center, 2018; Vogels et al., 2022).

In New Zealand, rates of internet and social media engagement are high. As of January 2022, 90% of New Zealand's total population were connected to the internet, with 89% making use of social media (We Are Social & Kepios, 2022). As of February 2022, the most popular social media platforms were Facebook, and Messenger, with 81% of New Zealanders between the ages of 16 and 64 using Facebook and 75% using Messenger, followed by Instagram (58%), WhatsApp (40%) and Snapchat (37%) (We Are Social & Kepios, 2022)³. However, these figures do not account for factors such as multiple account holders, bot accounts, and inactive or low-activity accounts.

³ Note that the 2022 version of this report excluded YouTube due to changes in the GWI survey questionnaire design. YouTube was the most used social media platform in New Zealand in 2020 and 2021, with 88% (2020) and 87% (2021) of NZ internet users making use of this platform (We Are Social & Hootsuite, 2020a, 2021).

Notably, as of early 2022, the lesser-known social media platform Discord ranked as one of New Zealand’s most used social media platforms, with 15% of internet users using Discord in the past year (We Are Social & Kepios, 2022). Whether this represents an increase in Discord’s use in New Zealand is uncertain due to changes to the Global Web Index survey questionnaire that underpins many Digital 2022 report findings on social media engagement in New Zealand (Datareportal, 2023). Discord may not have been included as an option in previous iterations of the survey. However, Similarweb app rankings for January 2023 place Discord as the fourth most-downloaded social networking app in the Apple App Store (Similarweb, 2023a), and the 34th most often visited website in New Zealand during the December 2022 period (Similarweb, 2023b).

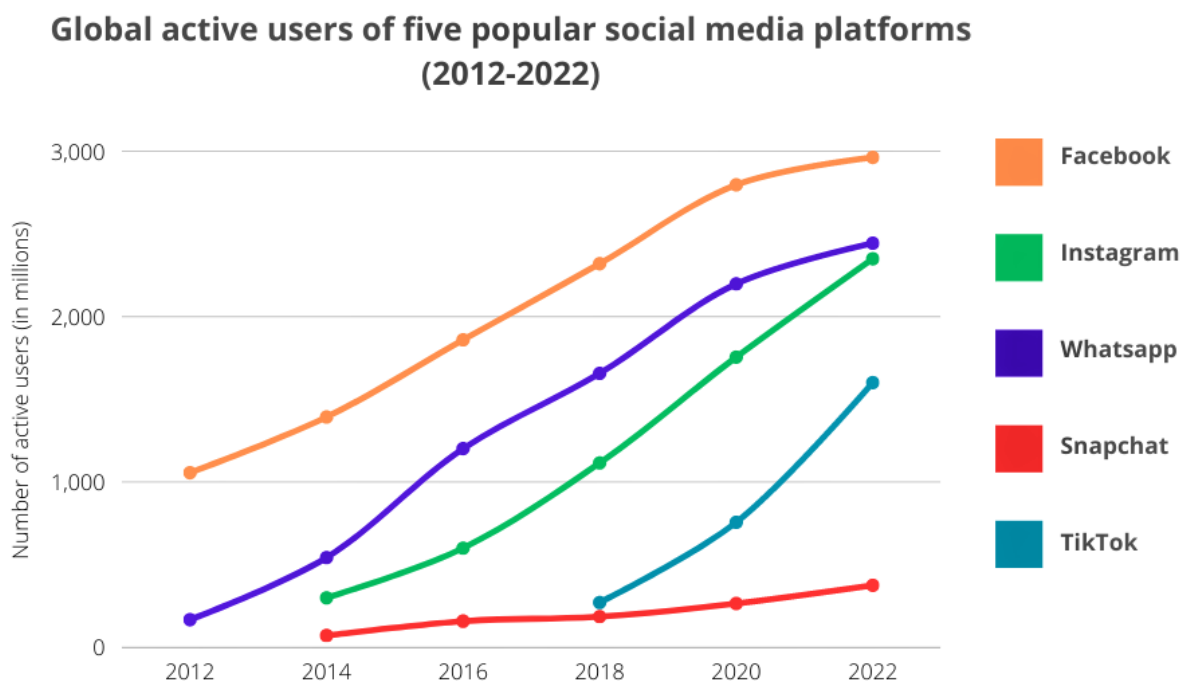


Figure 5: Increases in active global userbase for five popular social media and messaging apps from 2012 to 2022. Note that source data pertains to quarterly active users, plotted data uses figures for quarter 4 of every second year. Source: Iqbal (2023a, 2023b, 2023c, 2023d, 2023e)

Importantly, the primary reason people cite for engaging with social media, both globally and in New Zealand, is “keeping in touch with friends and family” (We Are Social & Hootsuite, 2022; We Are Social & Kepios, 2022). In New Zealand, 64% cited this as their primary reason for engaging with social media, and 60% used social media to follow accounts belonging to friends, family, and people they knew, followed by accounts belonging to “bands, singers and musicians” (30%) (We Are Social & Kepios, 2022). These statistics highlight social media’s importance in facilitating existing personal relationships and social networks. The centrality of established social connections to people’s engagement with social media may be a particularly important factor to

consider in relation to social supply behaviours that are channelled through social media and messaging apps.

2.3 Social media and social connection

As briefly discussed in Section 2.1, different social media platforms tend to facilitate different types of social connection and interaction with others (e.g., Alhabash & Ma, 2017; Boczkowski et al., 2018; Quan-Haase & Young, 2010). One vector through which researchers have explored this link is considering how social media and messaging apps facilitate the creation and maintenance of diverse forms of social capital (e.g., Ellison et al., 2007; Phua et al., 2017). For example, Facebook has been linked to an increased ability to create extended networks of ‘weak ties’ (Granovetter, 1973), allowing people to maintain distant social connections by sending ‘friend requests’ and interacting with platform connections via low-effort features such as ‘likes’ or ‘reacts’ to posts and photos (Ellison et al., 2007; Ellison & Vitak, 2015). By virtue of this platform design feature, researchers suggest SNSs like Facebook may enable the creation and maintenance of much larger social networks than would be possible in a non-digital environment (Donath, 2007; Haythornthwaite, 2005).

Alternatively, platforms like Snapchat and messaging apps have been linked more closely to the building of ‘bonding’ social capital (Adler & Kwon, 2002), or more intimate, private communications (Karapanos et al., 2016; Piwek & Joinson, 2016; Quan-Haase & Young, 2010). Researchers have found that young people’s use of Snapchat in particular is most often related to contexts involving friendship, family, and romantic relationships (Bayer et al., 2016). Furthermore, Snapchat’s popularity among younger age groups has been linked to perceptions of the app as closely equated with informal, relaxed daily contact with friends. This is in contrast to the need for more manicured self-presentation on platforms like Facebook and Instagram (Alhabash & Ma, 2017).

These linkages between platforms or apps and a specific type of social interaction can be tied into statistics presented in the previous section concerning the orientation of people’s daily social media engagement towards connecting with people *already* known to them in their non-digital personal networks (Ellison et al., 2007; Lampe et al., 2006; Subrahmanyam et al., 2008). Researchers highlight a similar dynamic among ‘digitally native’ teenagers today, with studies demonstrating their use of platforms like Snapchat as tools to formalise and foster friendships with others they meet at school, or as part of their hobbies and part-time jobs (Luomanen & Alasuutari, 2022; Yau & Reich, 2020). The importance of this association does not prevent many

platforms from being used to connect with strangers. For example, Instagram has been found to be an important platform for interacting with friends (Pew Research Center, 2018), but is also routinely used to interact with or follow influencers or celebrities (Phua et al., 2017).

These differences between the social contexts in which social media and messaging apps are used are likely to have ramifications for how the act of drug trading is navigated on social media. Haupt et al. (2022) suggest drug sellers may select platforms they perceive as able to link them to specific demographic user groups. However, it is likely that the ways in which people structure their broader engagement with social media to facilitate connections across different networks and groups have implications for how they try to situate drug trading in this environment. This dynamic may be particularly applicable in social supply settings, where people may already be connected across a range of different platforms and apps.

2.4 Digital privacy and surveillance

Concerns around digital privacy have been raised since the inception of social media platforms (e.g., Debatin et al., 2009; Young & Quan-Haase, 2009). These concerns take two principal forms. Firstly, they reflect social media's emphasis on self-disclosure through the construction of personal profiles, sharing of photos, stories, and status updates, etcetera, and the accessibility of this information to a broad range of others (e.g., Acquisti et al., 2015). Secondly, they underscore the widespread collection of user data by social media companies, and the potential for these data sources to be sold on to third parties or used for institutional surveillance purposes (e.g., Zuboff, 2019). Both areas are likely to be consequential for people engaging with social media drug markets and may present buyers and sellers with additional challenges to navigate as part of drug transactions.

2.4.1 *Sharing personal information on social media*

Historically, social media has encouraged users to disclose personal information to others in a manner described as *"public by default and private through effort"* (boyd, 2014 p. 12). This statement depicts what has often been the complexity of navigating the blurred boundaries between public and private space on social media, and the blurring together of different social, professional, and familial contexts on one platform (e.g., boyd, 2014; Joinson et al., 2011; Nissenbaum, 2010). From a privacy perspective, this has decreased people's ability to control how they share information with selected others, and in what context that information is interpreted (boyd, 2007; Marwick & boyd, 2014). boyd (2008) terms this dynamic 'context collapse', describing

how people need to simultaneously navigate different social roles, norms, and relationships as part of social media engagement.

Contemporary social media allows a more nuanced approach to managing individual privacy, providing users with a range of ways in which they can control how visible their personal information is to others. As mentioned in Section 2.1, many platforms now incorporate ephemeral data design features (Morlok et al., 2017) to facilitate the posting or sending of temporarily available content (e.g., stories, message-timers, etc.). Additionally, the launch of privacy controls on platforms like Facebook, provides people with some ability to regulate how visible their profile and content is to others (e.g., Bartsch & Dienlin, 2016; Masur & Scharkow, 2016). As social media technologies have become more domesticated – the process by which people develop shared understandings of and norms around the use of a given technology (Haddon, 2011) – people have also become more accustomed to managing context collapse (Marwick & boyd, 2014; Young & Quan-Haase, 2013). Part of this learning process involves a level of acceptance that surveillance by others on social media is inevitable, and structuring responses to managing the risks of unwanted surveillance (Duffy & Chan, 2019). As a result of this growing awareness, people often develop strategies to maintain privacy on social media, such as through the use of ‘fake’ Instagram accounts (Colloquially sometimes called “finstas”) (e.g., Kang & Wei, 2020), or by separating their use of different platforms and apps to segregate particular groups and relationships (e.g. Boczkowski et al., 2018), as discussed in Section 2.3.

However, despite greater awareness of the potential for privacy violations as part of social media engagement, it remains impossible to entirely pre-empt privacy exposure and violations in the social media environment (boyd & Marwick, 2011; Marwick & boyd, 2014). From a social media drug market perspective, this is important because social media drug trading is likely to take place on many of the same platforms and apps that people use as part of their daily lives (Moyle et al., 2019). As a result, people engaging with social media drug markets need to think about how they use these platforms for drug trading to prevent unwanted exposure to other people in their social networks, such as employers or family members, and the police.

2.4.2 Institutional surveillance and the social media business model

As digital engagement and smartphone ownership have increased, so too have the surveillance capacities of government institutions and private companies (e.g., Lyon, 2014; Trottier, 2012; Van Dijck, 2014; Zuboff, 2019). Researchers have documented the rise of low cost, mass collection of telecommunications and digital trace data, facilitating ‘deeper’ and ‘broader’ institutional

surveillance practices (e.g., Jarvis, 2020; Kuehn, 2016). Social media collection of user data also forms a valuable resource within this broader surveillance setting, which Van Dijck terms “connectivity”, whereby user engagement within and across different platforms generates data that can be sold to third parties as data profiles and data products (Van Dijck, 2013). This profit-driven business model feeds the “platformisation” dynamic (Section 2.1), whereby social media companies continuously seek to expand the amount of data they can harvest (Helmond, 2015).

Hence, though features like ephemeral data design and privacy controls (Section 2.4) grant people some control over what they post or share, users continue to relinquish control over forms of data that are the most profitable for social media companies (Acquisti et al., 2015; Koops, 2011; Smith et al., 2012). One such example is metadata, defined by Kitchin as “*data about data*” (2014, p. 8). Metadata includes data points such as IP addresses, date- and timestamps on messages or EXIF data on photos, which are generated alongside online interactions (e.g., Newell & Tennis, 2014). Though metadata may be small, in aggregate it can be used to reveal considerable personal information, particularly when combined with other data sets and sources (Newell & Tennis, 2014; Perez et al., 2018; Sarre, 2017).

Social media data sets and user data profiles form part of a larger global data trade in which vast sets of digital trace data (big data) are bought and sold, aggregated and analysed to generate novel insights and uncover hidden patterns (e.g., boyd & Crawford, 2012; Kitchin, 2014). As such, big data becomes a valuable tool for ever-expanding “dragnet” surveillance practices where ‘anything and everything’ becomes a datapoint that can be aggregated, analysed in combination with different data sources and stored exponentially (Kuehn, 2016; Lyon, 2014). Koops (2011) describes two parallel flows of user data that feed into contemporary big data: “digital footprints” and “digital shadows”. Here, “digital footprints” refers to data left behind by individuals themselves, while “digital shadows” describes data about the individual left behind by *others*. These digital footprints and shadows *endure* over time (Koops, 2011). It is therefore likely that the expansion of big data analytics across private and public sectors will lead to unexpected future outcomes and far-reaching consequences for the individual (e.g., Kitchin, 2014; Koops, 2011; Richards & King, 2016). This may be particularly consequential for those groups whose demographic attributes (e.g., ethnicity) already make them more vulnerable to negative institutional outcomes or greater surveillance (Ferguson, 2017a; O’Neill, 2016).

Notably, in the context of this research, diverse governmental and law enforcement agencies globally have been reported to use big data analytics software, including social media data sets, both in New Zealand and abroad. International examples include Europol (Fotiadis et

al., 2022) and the LAPD (Brayne, 2017), among other US Government agencies such as the NSA (Greenwald & MacAskill, 2013; Van der Velden, 2015). In New Zealand, the Government Communications Security Bureau (GCSB) has been linked to “dragnet” surveillance practices (Kuehn, 2016). In addition, the New Zealand police and other government agencies have similarly trialled several big data analytics software programs that monitor social media platforms or draw on social media data sets (Chen & Allen, 2020; Pennington, 2020; Pennington, 2022).

Researchers have expressed alarm at the lack of transparency, or the ‘black boxed’ nature of social media data collection practices (e.g., O’Neill, 2016; Pasquale, 2015; Van Dijck, 2013; Zuboff, 2019). Indeed, Lyon (2014) highlights the imbalance between continuously expanding institutional surveillance capabilities compared to the dwindling insight the individual has into how their data will be used and for what purposes. Today, though people are increasingly aware of social media data collection practices and the sale of their data to third parties, the scope and scale of these practices remain difficult to comprehend, and ultimately beyond the control of the individual (e.g., Hargittai & Marwick, 2016). Several high-profile whistle-blower revelations and public scandals (e.g., the Cambridge Analytica scandal of 2018) provide powerful examples of the scope and real-world effects of social media data gathering, and the potential for big data analytics to manipulate people’s behaviours (e.g., Bloomberg, 2018; Jarvis, 2020; Wong, 2019). Growing public awareness has pushed people towards more secure platforms like Telegram and Signal, which have seen their userbases grow in recent years (O’Flaherty, 2021; "Signal app enjoying 'unprecedented' growth after WhatsApp controversy," 2021). In New Zealand, at the time of writing in early 2023, Telegram, and Signal were among the top 20 most frequently downloaded social media apps from the Apple App Store (Similarweb, 2023b).

Institutional surveillance and the digital data trade represent undercurrents in the social media landscape that may be consequential for people using platforms and messaging apps to commit crimes such as drug trading. The data generated as part of these transactions is likely to be bound up in the data profiles social media companies build on their users, forming part of information used to generate behavioural predictions. This is particularly concerning given evidence that the incorporation of big data analytics into an increasing range of public and private sectors, including law enforcement, may lead to a perpetuation of social inequalities and biases (O’Neill, 2016). Questions arise as to how these data flows and their relationship to social and economic outcomes will impact people who engage with social media drug markets, and whether this may lead to a perpetuation of many stigmas and social harms associated with drug use.

This chapter has provided background and context on contemporary social media and messaging apps to frame presentation of key theoretical concepts (Chapter 3) and the subsequent findings chapters (Chapters 5-9) and discussion (Chapter 10). As part of this chapter, I have endeavoured to articulate some of the hidden complexities underpinning the contemporary social media landscape in which social media drug markets are based. I use the adjective “hidden” in this context to describe the nuances of this landscape, which may often be masked by the day-to-day, domesticated, and embedded nature of social media and messaging apps and people’s engagement with them. Factors such as convergence (Jenkins, 2006), platformisation (Helmond, 2015) (Section 2.1), institutional surveillance (Section 2.4.1), and behavioural adaptations aimed at navigating social relationships and individual privacy on social media (Sections 2.3 and 2.4) illustrate that social media drug trading may be more complex than current research suggests. The following chapter presents the theoretical framework for this thesis. Selected communications and social media theory and concepts (Section 3.2) help to frame the hidden complexities of social media and messaging app engagement, as well as their links to the respective findings chapters of this thesis.

Chapter 3: Key concepts and theory

I draw on theoretical concepts from both drug market *and* communications scholarship to present an interdisciplinary exploration of social media drug markets and their impact on New Zealand's drug landscape. Rather than presenting a single overarching theoretical framework, I outline the most important theoretical concepts informing the analysis presented in Chapters 6 to 9. Chapter 10 presents a synthesis of findings and conclusions will also synthesise these core theoretical concepts.

Concepts are presented as follows: Section 3.1 presents two key theoretical concepts drawn from drug use and drug market theory. First is Parker, Measham and Aldridge's (1998) concept of the normalisation of recreational drug use (3.1.1), followed by open and closed drug market typologies (3.1.2). Both these theoretical perspectives carry through *all* qualitative findings chapters (6-9). As discussed in Section 1.4.1, analysis presented in Chapters 7–9 uses communications and social media theory and concepts as stepping stones to explore how people's engagement with a broader social media landscape may influence social media drug market dynamics and behaviours. The communications and social media concepts I use in these later chapters are presented in Section 3.2. Section 3.2.1 introduces affordance theory, focusing on its application to the study of social media platforms (3.2.1). Section 3.2.2 presents polymedia theory, followed by the concept of "imagined surveillance" (3.2.3). Finally, Section 3.3 outlines the epistemological stance framing the findings presented in this project: critical realism. As part of this epistemological framing, I discuss how critical realism can be linked to the study of technology (3.3.1), including digital technologies such as social media, to frame my use of communications theory concepts, as presented in Section 3.2.

3.1 Drug market and drug use theory

3.1.1 The normalisation of recreational drug use

The phrase normalisation of recreational drug use (sometimes termed 'the normalisation thesis') was first coined by Parker et al. (1998) to explain widespread and large-scale increases in drug

trying behaviours observed among teenagers in the 1990s, often referred to as the “decade of dance” (Aldridge, 2008; Aldridge et al., 2011). It is suggested that the use of certain drug types ‘sensibly’ and in a leisure-based setting – broadly ‘recreational’ drug use (See Glossary) – was increasingly a ‘normal’ part of youth culture at large (Parker et al., 2002). Normalisation is defined by Parker as a *gauge* or a “barometer” of changes to social attitudes and social acceptability of drug use in its wider social context (Parker, 2005). As such, normalisation is concerned with attitudes and perceptions of drugs and drug use among those groups who do not use drugs, not just those who do (Parker, 2005). This dynamic is summarised by Aldridge et al. (2011) as a shift in certain types of drug use “*from the margins towards the centre of youth culture*” (p. 202).

Emphasis is placed on normalisation as an ongoing and changeable process arising from six interdependent factors (See Figure 6). These factors include levels of drug availability, past and present rates of ‘regular’ drug use and drug trying behaviours among young people, and future intentions to use drugs – even among groups who have not yet done so. These trends are coupled with levels of ‘knowledge’ about drugs or being “drug-wise” (Parker et al., 1998), along with the broader social context in which drug use is represented as acceptable or even desirable in popular culture such as adverts or films (Blackman, 2004).

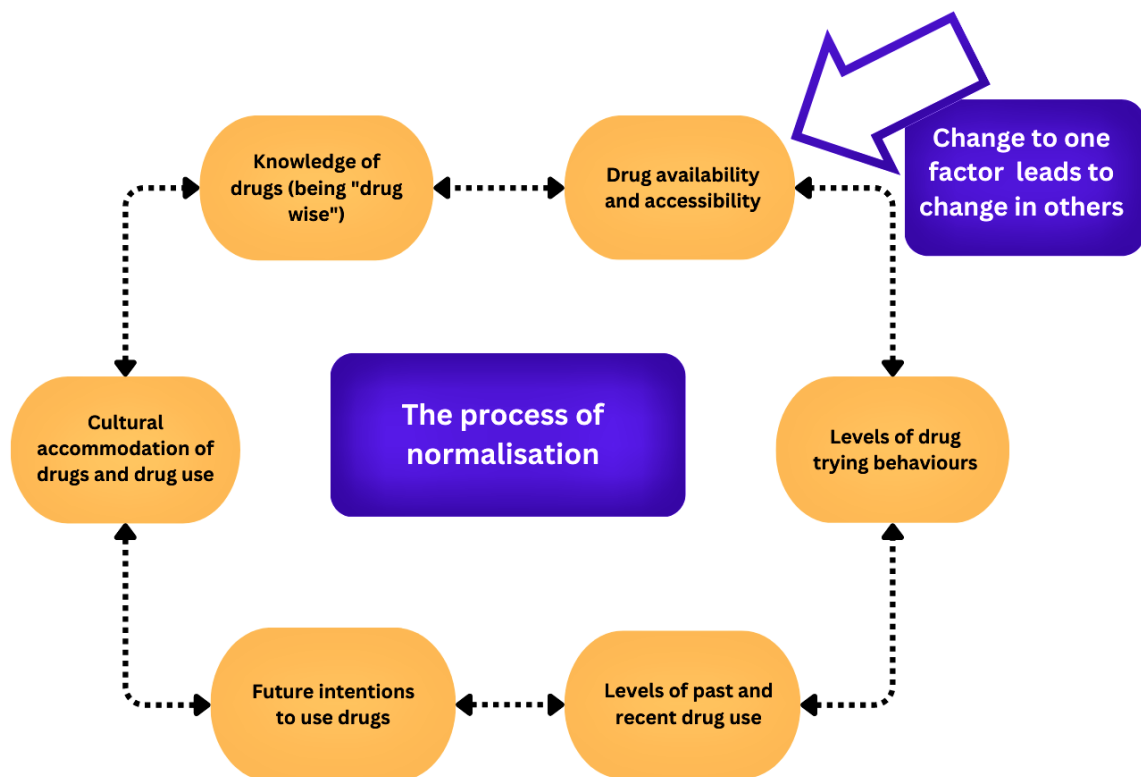


Figure 6: The different factors influencing the normalisation of drug use according to Parker et al. 1998.

Originally, normalisation was mostly concerned with cannabis and psychedelics (Parker et al., 1998). In New Zealand, cannabis has been reported to be considerably normalised among younger age groups (Robertson & Tustin, 2020). Historically, drug types like MDMA have been linked to normalisation among specific, subcultural groups such as clubbers (Duff, 2005; Hutton, 2010; Measham & Moore, 2009; Smith et al., 2009), or groups linked to particular types of dance music events (Ter Bogt & Engels, 2005). There is some evidence that the normalisation of MDMA use may also be occurring more broadly (Mounteney et al., 2018; van den Bos et al., 2022), though this remains understudied in comparison to cannabis use. Since its inception the concept of normalisation has shifted into the mainstream to become a widely discussed and researched topic in many Western countries (e.g., Duff, 2005; Duff et al., 2012; Measham et al., 1994; Sznitman, 2008; Wilson et al., 2010) including New Zealand (Hutton, 2010; Robertson & Tustin, 2020). An increase in research exploring normalisation in non-western countries or among immigrant communities has also shown some changes to young people’s attitudes to some types of drugs (Cheung & Cheung, 2006; Dumbili, 2020; Williams et al., 2017).

The concept is not without its critics. Shildrick (2002) has argued that it over-homogenises youth drug use and does not account for the diversity of perceptions and interactions with drugs and drug use across groups – or “differential normalisation” (See also, Hathaway et al., 2016). Others question the extent to which normalisation is only attributed to the post-1990’s period, arguing that the concept ignores the continuities and nuances of youth drug use over time (Blackman, 2004; Shiner & Newburn, 1997). Indeed, recent research exploring normalisation in western countries has suggested that “denormalisation” or differential normalisation (Shildrick, 2002) of recreational drug use, including smoking and drinking, may be occurring among teens and young people today (Asbridge et al., 2016; Caluzzi et al., 2022; Williams, 2016). This is supported by emerging research exploring apparent reductions in youth risk taking behaviours, including drug and alcohol use internationally (e.g., Ball et al., 2023; De Looze et al., 2019; Raitasalo et al., 2021) and in New Zealand (Ball et al., 2020; Ball et al., 2019). Some researchers argue these patterns may be linked to high rates of social media engagement, among other factors, and the importance of these digital platforms as teen social spaces (e.g., Luomanen & Alasuutari, 2022).

Despite these broader changes around youth drug use globally, as discussed in Section 1.3, existing research suggests that the development of social media drug markets may amplify the normalisation of recreational drug use among younger age groups (Demant & Bakken, 2019; McCulloch & Furlong, 2019). This reflects the extent to which social media drug markets can make drugs more accessible and broaden the range of substances available to people beyond their

offline social networks (Demant & Bakken, 2019; Moyle et al., 2019). Additionally, innovative advertising methods using platform features like stories or Instagram profiles make drugs more visible and a more 'normal' part of people's social media landscape (McCulloch & Furlong, 2019). The situating of social media drug markets within a broader context of heightened access to both digital drug content and communities generally (Section 1.1.5) may also influence normalisation by democratising access to 'drug knowledge' and strengthening perceptions of drug use as culturally acceptable (Parker et al., 1998). The potential for this global digital landscape to influence local patterns of drug use may be particularly important in a geographically isolated countries like New Zealand, where historically, trends in drug use have often differed from those documented internationally (Section 1.2).

In this project, normalisation serves as a backdrop against which social media drug markets in New Zealand are explored. Though this concept feeds into each of the subsequent findings chapters, it is not the dominant theoretical framework or concept used in any of them. Rather, the ways in which normalisation and social media drug markets may be interwoven are discussed as part of Chapter 10, which presents a synthesis of project findings and concluding remarks.

3.1.2 Open and closed drug market typologies

This project places considerable focus on differentiating the ways in which social media drug markets take shape in New Zealand. To understand these differences in structure and explore the role played by social media and messaging apps in facilitating a range of drug trading dynamics, I use different drug market typologies based around concepts of 'open' and 'closed' drug markets (Hough & Natarajan, 2000; May & Hough, 2004), sometimes referred to as 'public' and 'private' (Sandberg, 2012). This typology is based on Eck's (1995) model of the geography of illegal drug markets, which distinguishes between network-based drug markets consisting largely of strangers, the latter being more closely tied to particular geographic locations. In this vein, open or public drug markets are typically characterised by some level of public visibility and transactions between strangers – a label often applied to street drug markets. Conversely, closed drug markets are characterised by private spaces and transactions within a smaller network of known associates (May & Hough, 2004). Coomber has suggested that most contemporary drug markets are effectively closed (e.g., Coomber, 2006). This drug market typology offers sellers greater security from police and robbery and allows buyers to build trust with one supplier. However, selling within closed networks limits the potential profits sellers can make in comparison to selling in open

market environments characterised by greater choice and range of buyers and products (May & Hough, 2004). The attributes of these respective drug market typologies are contrasted in Table 1 below. Table 1 also includes ‘semi-public’ drug markets (Sandberg, 2012). These open/closed market hybrids form in locations like pubs and clubs, making them more closed off from outsiders than their open or public counterparts. Additionally, though many transactions take place between strangers, selling often remains more discreet as buyers must be able to recognise sellers and display particular social skills to arrange transactions (Sandberg, 2012).

Table 1: Comparison between the general attributes of different retail level drug market typologies. Based on Eck (1995) Hough and Natarajan (2000), and May and Hough (2004).

	Open or Public drug markets	Closed or Private drug markets	Semi-public drug markets
Visibility	Medium-high	Low	Medium
Location accessibility	High	Low	Medium
Choice of buyer/product	Low-high	Low	Medium-low
Buyer/seller relationship	Strangers	Social (trust-based) networks	Strangers and social networks
Risk of exposure to police	High	Low	Medium-low
Risk of robbery/violence	Medium-High	Low	Medium-low
Physical location examples	Street drug markets, ‘tinny houses’	Private houses, arranging to meet a seller at a specific location	Pubs or clubs, festivals, workplaces

The closed drug market typology extends into less-commercial drug trading practices termed ‘social supply’ (e.g., Chatwin & Potter, 2014; Potter, 2009). Social supply refers to drug transactions taking place between friends or social associates, often for little or no financial profit, and is a particularly common mode of drug trading among younger age groups such as teenagers (e.g., Coomber & Turnbull, 2007; Jacques & Wright, 2015; Parker, 2000) and university students (Hathaway et al., 2018; Moyle & Coomber, 2019). Examples of social supply include sourcing for friends, acting as a go-between to buy drugs for the group, or sharing purchased drugs with friends (Coomber & Turnbull, 2007). This type of drug transaction ties into normalisation (See Section 3.1.1) (Parker, 2000), whereby the social supply of drugs between friends is bound up with recreational drug use practices and has come to be viewed as normalised in its own right in many

western countries (Chatwin & Potter, 2014; Coomber et al., 2016; Hathaway et al., 2018). The normalisation surrounding the social supply dynamic impacts perceptions of what counts as 'dealing', with involvement in supplying drugs to friends often framed in terms of reciprocity and contrasted with the motives of profit-driven 'real dealers' (e.g., Bright & Sutherland, 2017; Hathaway et al., 2018).

The spread of mobile technology has played a central role in facilitating a shift from open to closed drug markets (See also Section 1.2.1), affording sellers greater flexibility and discretion, as well as enabling the rise of delivery services (e.g., Barendregt et al., 2006; Curtis et al., 2002; Sjøgaard, 2019; VanNostrand & Tewksbury, 1999). As the mobile phones have transformed into smartphones, social media and messaging apps have engendered new ways to re-organise retail-level drug trading. Importantly, Bakken and Demant (2019) propose a social media drug market typology based on the open and closed distinction, which distinguishes between 'public' digital markets and 'semi-public/private' digital markets. Public digital markets are effectively open to all interested buyers and sellers, much like traditional street markets (Curtis et al., 2002; May & Hough, 2004). The authors place Facebook drug selling groups, or platforms like Instagram in this category as both platforms allow sellers to advertise and actively recruit new buyers (Demant et al., 2020; McCulloch & Furlong, 2019; Moyle et al., 2019). Semi-public/private digital markets refer to social media drug markets existing on platforms such as Snapchat or messaging apps such as WhatsApp. On these platforms, transactions are organised privately between buyer and seller, and more likely to be predicated on a relationship of trust as buyers must have prior knowledge of a seller's contact details (Bakken & Demant, 2019; Demant & Bakken, 2019). However, platforms like Snapchat enable a hybrid drug selling dynamic, where features like stories can be used to 'advertise' to a network of trusted buyers, creating a semi-public market environment (Bakken & Demant, 2019).

Drug market typologies are used to frame findings in Chapters 6 to 9 of this thesis. They form the core theoretical framework presented in Chapter 6. However, these typologies also feature as part of Chapters 7, 8 and 9, where they are used to help frame analysis alongside the communications and social media concepts.

3.2 Social media and communications theory

3.2.1 Affordance theory

The concept of affordances derives from Gibson's (1979) work on visual perception in ecology. Gibson argued that animals perceive objects in their environment not in terms of what the object *is*, but rather based on what they can or cannot *do* with it. He suggested this action-based means of relating to objects reflects the animal's perceptions of the object's general properties and attributes – or *affordances* – in terms of how they can be adapted to meet its specific behavioural needs or goals (Gibson, 1979). Since then, the concept's usefulness as a means of communicating the relationship between structure (e.g., the affordances of an object) and agency (e.g., the changing behavioural context or needs of the subject) (e.g., Parchoma, 2014) have seen it imported into a range of fields, ranging from engineering (e.g., Maier & Fadel, 2009) to sociology (e.g., Boase, 2008) and design studies (Norman, 1988; Norman, 2013). In the context of this study, I leverage affordance theory as it relates to the study of people's engagement with digital technology and social media.

3.2.1.1 Social media and messaging app affordances

The proliferation of digital technology as part of global everyday life has seen researchers grapple with how best to explore technology's features and their impact on human behaviour without attributing too much power to digital technology (e.g., determinism), or to its users (e.g., constructivism) (see also Section 3.3 on epistemology) (Davis, 2020; Nagy & Neff, 2015; Treem & Leonardi, 2013). In the field of platform studies Hutchby (2001) proposed affordance theory as a means of balancing the behaviour-shaping influence of platform design, features, and interfaces with their interpretation and adaptation by users. This perspective has since become a common theoretical lens through which to explore user engagement with social media and messaging apps (e.g., Bucher & Helmond, 2018; Evans, Pearce, et al., 2017; Treem & Leonardi, 2013). In relation to applying affordance theory to social media drug trading, this study takes the broad definition proposed by (Evans, Pearce, et al., 2017), as follows: “*A multifaceted relational structure*’ (Faraj & Azad, 2012, p. 254) which exists between an object/technology and the user that enables or constrains potential behavioural outcomes in a particular context” (p. 36).

The “*multifaceted relational structure*” (Faraj & Azad, 2012, p. 254) linking social media affordances and user behaviours can be conceptualised on a spectrum of more, or less *support* for, or *resistance* to a particular type of action. Davis (2020) explains this dynamic as: “*a subtle*

dance in which technological objects push and pull with varying degrees of insistence while human subjects navigate with more and less motivation, creativity, and skill” (p. 18). In a similar vein, Davis (2020) argues that technologies can *demand, request, encourage, discourage, refuse, or allow* the demands placed on them by their users. A *demand* implies a level of force, while a *request* indicates preference. Platforms *encourage* when they make an action easily available to the user, and they *discourage* when they place obstacles between the user and an action. They *refuse* when they make an action impossible, and they *allow* when they neither discourage or encourage a particular outcome (Davis, 2020; Davis & Chouinard, 2017). This conceptualisation of affordances is useful in that it avoids one of the core criticisms of this concept, which is its overly binary application (e.g., a social media platform either affords an action or it does not) (Davis, 2020; Evans, Pearce, et al., 2017). Hence, though users may successfully adapt platform features to a particular context of behaviour (e.g., drug trading), the actual level of ‘fit’ between this context of use and the affordance at hand may be more complex than it appears.

Examples of social media affordances that feature as part of this thesis are listed in Table 4 below. Each affordance is listed alongside a description and examples of platform features that direct user engagement with the affordance in a particular way, *or* alternatively, user actions and adaptations that *circumvent* or *negotiate* the demands of an affordance. For example, the affordance of persistence (See Table 4) describes how digital content and data can remain accessible over time (e.g., Treem & Leonardi, 2013). This affordance is inflected in different ways across platforms and platform features and is also linked to other affordances listed in Table 4, such as visibility (boyd, 2014). For example, posted content on Facebook and Instagram remains accessible over time unless manually deleted by the user, thereby increasing its visibility to others to some extent⁴. Manual deletion of persistent content provides an example of user adaptations to the format by which persistence affordances are arranged on these platforms. Alternatively, Snapchat is designed around self-deleting data (Xu et al., 2016), thereby arranging both persistence and visibility affordances in a unique way. In the social media drug markets literature, Moyle et al. (2019) have suggested that self-deleting data is perceived as one of the principal benefits of using Snapchat for drug trading. In this vein, Snapchat’s arrangement of persistence and visibility affordances represents a higher level of “complementarity” (Gibson, 1979) with the behavioural context and security needs of drug trading than Messenger’s permanent-by-default chat feature.

⁴ Increased visibility can be mediated by features such as privacy controls (Facebook), or an ability to set private profiles (Instagram) as shown in Table 4.

Additionally, the relationship between social media platform features and different types of social connection (Chapter 2, Section 2.3) is also mediated by affordances. For example, Facebook’s association affordances (See Table 4) (Treem & Leonardi, 2013), such as visible social networks and searchable profiles, makes it well suited to maintaining larger social networks of ‘weak ties’ (e.g., Ellison & Vitak, 2015). These affordances are therefore also likely to influence Bakken and Demant’s (2019) public and semi-public/private digital market typologies (Section 3.1.2), translating into variation in drug trading dynamics. However, as outlined in Section 1.4, to some extent, social media drug markets represent an *adaptation* of social media as a group of platforms not specifically designed to facilitate drug trading. In turn, it may be that perceptions of platform affordances, and the extent to which they “push” and “pull” (Davis, 2020) on drug trading behaviours, have ramifications for how people experience or are able to leverage social media drug trading beyond enabling different drug market dynamics. Affordance theory influences both communications concepts subsequently discussed in Section 3.2.2 – polymedia theory, and Section 3.2.3 – “imagined surveillance”. As such, it plays a small role in Chapters 7 and 8 and is discussed in more detail as part of Chapter 9.

Table 2: Definitions of social media affordances featured as part of this thesis and examples of their corresponding platform features and user adaptations

Social media affordance	Meaning	Examples
<i>Visibility</i> (boyd, 2014; Treem & Leonardi, 2013)	The ability to make personal information such as personal preferences, friendship networks, activities, etc., easily visible and accessible to others.	<ul style="list-style-type: none"> • Facebook/Instagram profiles (including posts, photos, updates, videos) • Posting stories • Joining groups on Facebook, or ‘attending’ Facebook events • Tagged photos • Privacy controls or private profiles (can regulate visibility) • Posting stories that are visible only to particular groups (e.g., private Snapchat stories, and Instagram ‘close friends only’ stories) • Creating ‘fake’ or multiple accounts for different audiences (e.g., ‘dealer’ accounts to sell on Instagram).
<i>Persistence</i> (boyd, 2014; Treem & Leonardi, 2013)	The continued accessibility of content overtime (e.g., once specific event has finished).	<ul style="list-style-type: none"> • Catalogues message history • Catalogues past-content such as photos, comments, posts, or tweets • Posting temporarily available content like Stories • Using message timers or sending snaps on Snapchat

		<ul style="list-style-type: none"> • Manually deleting catalogued content such as messages or photos.
<i>Communication</i> (Hutchby, 2001)	The ability to communicate, collaborate and engage with different people/groups using user generated content (one-to-one communication AND one-to-many).	<ul style="list-style-type: none"> • Direct messaging (as well as group chats) • Posting photos, videos, updates, tweets • Stories • Leaving comments • Video- and voice calling.
<i>Association</i> (Treem & Leonardi, 2013)	The ability to establish connections between oneself and others or between oneself and posted content.	<ul style="list-style-type: none"> • Visible friend lists on Facebook • Followers/following lists on Instagram • Tagging friends accounts in photos • Suggested friends or accounts to follow • Links between user account and content (e.g., photos posted on an Instagram profile) • Creating multiple accounts to keep certain content separate from one's general social media persona (e.g., break associations between content and user).
<i>Pseudonymity</i> (Van der Nagel, 2017)	The ability to disengage from one's identity while participating, communicating, and collaborating with others.	<ul style="list-style-type: none"> • Username-based sign up • Creating fake profiles using an anonymous username • Using multiple accounts (see above), such as 'throwaway' accounts on Reddit.

3.2.2 Polymedia theory

Affordance theory underpins the second communications theory used in this thesis: polymedia (Madianou, 2014, 2016; Madianou & Miller, 2012a, 2012b). Polymedia theory was developed from Madianou and Miller's ethnographic fieldwork with Filipino and Caribbean migrant workers in the UK and their use of different communications media (e.g., video calls, Facebook, instant messaging, voice calls, email, etc.) to maintain contact with their families, partners and friends who remained in their home countries (Madianou & Miller, 2012a). Polymedia sits alongside other major communications theories such as Uses and Gratifications (U&G) (e.g., Quan-Haase & Young, 2010) that attempt to explain how and why people engage with certain technologies or platforms for different purposes. However, where theories such as U&G and affordance theory explain the relationship between people and technology, polymedia is concerned with how communications technology is used *within* people's relationships.

Polymedia theory argues that a communications environment comprised of easy access to a diverse range of different media at low cost and rising rates of digital literacy have ramifications for how people engage with communications media as part of their relationships (Madianou, 2016; Madianou & Miller, 2012b). These factors have been compounded by the emergence of the smartphone, which Madianou argues represents a polymedia environment in its own right (2014). Importantly, diversity in media choice is coupled with convergence (Jenkins, 2006) between previously distinct media (See Section 2.1) and the merging together of multiple media on one device (e.g., the smartphone). Madianou and Miller argue that in this converging media environment, people differentiate between media based on what they can do in a specific relational context, rather than purely based on their specific features:

*Polymedia is an emerging environment of communicative opportunities that functions as an 'integrated structure' within which each individual medium is defined in relational terms in the context of all other media. In conditions of polymedia the emphasis shifts from a focus on the qualities of each particular medium as a discrete technology, to an understanding of new media as an **environment of affordances**.*
(2012b, p. 170, emphasis added)

According to polymedia theory, affordances guide how people compare available media options. People both distinguish *between* platforms with very different features (e.g., Instagram versus Snapchat), and also between platforms or apps with *similar* features (e.g., WhatsApp versus Messenger) (Madianou & Miller, 2012b). These distinctions are made relative to the social and emotional context of a particular relationship (Madianou & Miller, 2012a). For example, Peng (2016) describes how Chinese students based in Hong Kong used WeChat exclusively for close personal contact with family and friends on mainland China, and WhatsApp for more formal, less intimate communications with their classmates and contacts in Hong Kong. These findings exemplify the ways in which different platforms come to *form* different relationships in a polymedia environment (Madianou & Miller, 2012b).

The process of “constituting” a relationship using different platforms involves negotiation between the interaction partners, as both sides try to manage how interactions take place by directing communication through different platforms or mediums (Madianou & Miller, 2012a). This means that polymedia is affected by and reflective of power relations between the people in the relationship (Madianou & Miller, 2012b). The process of reaching out, responding, rejecting, and accepting others’ choice of communication medium at any given time sends the recipient a

message about the *nature* of the relationship, generating very real social and emotional consequences (See also Gershon, 2010a; Gershon, 2010b).

Though polymedia theory is often framed in terms of close social, romantic or familial relationships, it can also be used to think about how different platforms may come to be linked to different drug market contexts or selling dynamics (Bakken & Demant, 2019). As drug market interactions and relationships become more digitally mediated, buyers and sellers are confronted with the need to make decisions around which platforms to use for drug trading given there are many options available. This may be particularly true of social supply between ‘friends’, where people can already be connected across different platforms. Polymedia theory is the dominant theoretical concept used in Chapter 7.

3.2.3 “Imagined surveillance”

As outlined in Chapter 2 (Section 2.4), social media forms part of a global digital data trade, enabling more widespread and comprehensive public and private institutional surveillance practices (e.g., Lyon, 2014; Zuboff, 2019). However, scholars suggest that surveillance practices are also increasingly a feature of people’s engagement with one another on social media, as watching and being watched by others becomes an intrinsic part of social media participation (e.g., Marwick, 2012). Lyon (2018) argues that embedding surveillance in society creates a “surveillance culture”, where individuals and citizens play an active role in participating in, engaging with, and responding to different forms of digital surveillance (See also, Lyon, 2017). In line with this he proposes the idea of “surveillance imaginaries” – “*shared understandings about certain aspects of visibility in daily life, and in social relationships, and normative commitments*” (Lyon, 2017, p. 829). “Surveillance imaginaries” are born out of day-to-day engagement with social media, as well as information gathered from media reports, popular culture (e.g., films) and digital engagement more generally. As such, they may not accurately reflect the realities of surveillance, particularly at the level of corporations and institutions. But these mental models of where surveillance ‘comes from’ and how it works influence, and shape “surveillance practices”, where people *respond to*, and/or *engage with* the potential for digital surveillance (Lyon, 2017, 2018).

Duffy and Chan’s concept of “imagined surveillance” applies Lyon’s idea of “surveillance imaginaries” more specifically to the ways in which younger generations are increasingly taught to expect and plan for the surveillance of their social media presence by a diverse range of institutional and social actors (Duffy & Chan, 2019). They argue that young people often think about the types of monitoring that *could* take place on social media, and how that *could* lead to

negative or positive future impacts. Duffy and Chan (2019) propose that “imagined surveillance” leads to the development of related “surveillance practices” (Lyon, 2017). These practices are guided by two interrelated aspects of user engagement with the social media environment: *imagined audience* and “*imagined*” *affordances* (Duffy & Chan, 2019). Imagined audience in relation to social media describes how people often structure their interaction with a specific platform, or mediate the types of information they disclose based on perceptions of *who* they are disclosing to or interacting with on a given platform (e.g., Litt, 2012; Litt & Hargittai, 2016). In this vein, people often try to pre-empt and proactively manage different forms of digital surveillance (Duffy & Chan, 2019). Second, “imagined” affordances (Nagy & Neff, 2015) reflect how people’s expectations and beliefs around platform features and functionalities guide the ways in which they approach and make use of them (See Section 3.2.1). In turn, these two parallel factors together create evolving surveillance management practices among young people, which combine strategic use of platform features with socially developed practices and understandings to mitigate the risk posed by online surveillance in *general* (Duffy & Chan, 2019).

Duffy and Chan (2019) apply “imagined surveillance” to the managing and curating of self-presentation on social media platforms like Facebook or Instagram. However, this concept is also useful for thinking about how social media surveillance and privacy risk may be perceived as part of social media drug trading, and how this may tie into ‘traditional’ areas of concern for people who buy and sell drugs, such as law enforcement. This is explored in Chapter 8.

3.3 Epistemological positioning

In this project I take a critical realist approach to my choice of methods (Chapter 4) and framing my research findings. Critical realism (Bhaskar, 1989) combines elements of both positivist/determinist ontologies and scientific empiricism with interpretivist/constructivist ontologies.

Critical realism holds that an external reality does exist (positivism), but that our knowledge of that reality is *always* partial (constructivism), mediated by social, cultural, economic and political structures and our experiences of them (Archer et al., 2013; Bhaskar, 1989). In this vein, critical realism allows for causal analysis of a social phenomenon by virtue of its acceptance of an independent ‘reality’ (in contrast to constructivism). But it also doesn’t ‘flatten’ that causal reality by over simplifying and ignoring social structures and relationships (in contrast to positivism) (Archer et al., 2013; Sayer, 2000). Critical realism is often used as an epistemological framing in the social sciences and humanities because the social worlds studied in these disciplines

cannot be ‘closed off’ from outside influences in the same way scientific experiments are able to isolate studied variables to discover a causal mechanism. Rather, the social research setting is *always* contingent on context, both external and internal in the form of the researcher’s own assumptions and biases (Archer et al., 2013; Danermark et al., 2019; Rhodes & Coomber, 2010; Sayer, 2000; Stevens, 2020). As a ‘middle ground’ epistemological perspective, critical realism allows for the balancing of agency and structure in research, making it similarly well suited for qualitative methods (Fletcher, 2017; Hammersley, 1992; Sayer, 2000).

In the field of drug and drug policy research, Stevens (2020) has argued that critical realism is a core way in which we can translate research into *better*, not just more meaningful, policy changes and outcomes. He suggests critical realism allows drug policy researchers to build on evidence and findings that ‘work’, while actively deepening understanding of the phenomena at hand, as opposed to becoming paralysed by relativism, or overly simplifying causal relationships (Stevens, 2020).

In this thesis I take the realist perspective that the findings presented in this project correspond to and shed light on the phenomenon of social media drug markets as they exist in New Zealand. However, I also acknowledge that my findings do not capture this phenomenon in full, and that they are context contingent. In this vein, I aim to *represent* rather than *reproduce* (Hammersley, 1992) the ‘reality’ of social media drug markets in New Zealand. Additionally, the dominance of the qualitative arm of this mixed methods project (See Chapter 4) automatically embeds a level of constructivism in my findings (Hammersley, 1992; Rhodes & Coomber, 2010). Rhodes and Coomber argue that objectivity in qualitative research inquiry “*is unavoidably a social construction in which research is a key player*” (2010, p. 62). Hence, my research findings are ‘constructed’ in that they reflect the methodological choices I have made and my own assumptions and biases as researcher (Further discussed in Chapter 4). My adoption of a critical realist philosophical stance also reflects the perspective I take on the relationship between digital technology and people – or specifically, social media platforms and messaging apps, and their use in a drug trading context. As such, it is important to sketch the contours of the critical realist perspective as it relates to the study of technology generally.

3.3.1 Critical realism and digital technology

To link the social media and communications theories with the epistemology presented above, I briefly discuss the relevance of the critical realist perspective to the study of technology generally. Here, I focus on technology in the form of artefacts that harness “*the capacities of material objects*

in order to extend human capabilities" (Lawson, 2017 p. 30). This definition encompasses engagement with digital technologies such as social media, which are mediated through material devices such as computers and smartphones (e.g., Madianou, 2014).

Epistemologically, perspectives on technology (including digital technology such as the internet) (Leaning, 2009), have often struggled to find a middle ground between technology's ability to impact and shape human behaviours (e.g., determinism or instrumentalism) and acknowledging that technology is socially shaped and adapted by its users (e.g., social constructivism) (Feenberg, 1999, 2002; Grint & Woolgar, 1997; Leaning, 2009; Schatzberg, 2018). Lawson (2006, 2008, 2017) has proposed that critical realism provides a means of reconciling what he terms technology's "*dual constitution*" (Lawson, 2006, p. 45). By "*dual constitution*" Lawson is referring to the interplay between a technology's structure and the social shaping of how it comes to be used by people (See also discussion of affordance theory in Section 3.2.1) (Lawson, 2008; Leaning, 2009).

Taking a critical realist perspective, Lawson argues that technology is fundamentally social, but the process of its creation involves embedding 'real' structure into the social processes and values the technology is based on (Lawson, 2008). Lawson frames this approach as a process of "isolation" and "reconnection" (Lawson, 2006, 2008, 2017). "Isolation" occurs most clearly at the design stage of a technology, which Lawson argues constitutes a closed system akin to a lab setting. In this isolated environment, the social values and assumptions designers embed into the technological artefact are reified to create structural attributes, features, and functions. However, an isolated technology must ultimately be reconnected to society and the individual user. During this process of reconnection, the technology moves from a closed system (the lab setting) into an 'open' system where people make sense of it as it and adapt it for diverse, unpredictable purposes (Lawson, 2006, 2008). As such Lawson argues that technologies have "*positions*" that exert influence over user action. But these positions are ultimately transformed through user *practices* (Lawson, 2008).

In this thesis, a critical realist perspective allows me to explore social media drug markets in terms of the impact these platforms and apps as structures have on drug trading in New Zealand. It also allows me to consider the ways in which people who buy and sell drugs adapt social media platforms and respond to diverse platform structures and attributes. This balancing of structure and agency is displayed in my choice of communications theory. In particular, the role of affordance theory (3.2.1), which undergirds both polymedia theory (3.2.2) and "imagined surveillance" (3.2.3).

Chapter 4: Methodology

This chapter presents an overview of the methodological approach used in this thesis to explore social media drug markets in New Zealand. Section 4.1 begins with a discussion of the mixed methods approach. Section 4.2 then presents the quantitative strand of the research drawing on data from the New Zealand Drug Trends Survey (NZDTS). Section 4.3 presents an in-depth discussion of the dominant qualitative strand of this methodology – anonymous messaging-based online interviews carried out using the encrypted messaging app Wickr Me. As part of this section I discuss recruitment of interview participants (Section 4.3.1) and present a detailed account of the interview process, discussing issues and challenges faced as part of using a messaging app as an interview tool (4.3.2). Finally, Section 4.4 outlines the second qualitative method employed in this project – observational data collection.

Section 4.5 moves into discussion of data analysis, beginning with Section 4.5.1 on statistical analysis of NZDTS data. Section 4.5.2 presents a detailed account of the thematic analysis of the qualitative interviews and how observational data were integrated into this approach. Lastly, Section 4.5.3 outlines the process for the literature review undertaken in this project.

4.1 Mixed methods approach

This thesis presents the results of a mixed methods approach to exploring social media drug markets in New Zealand. Statistical analysis of NZDTS survey data (4.1.1) was combined with qualitative online interviews carried out via messaging app (4.1.2) and observational data collection (4.1.3). A mixed methods approach was chosen for several reasons. Firstly, mixed methods have been highlighted as suitable for broad, exploratory research (Mukumbang, 2021). Combining quantitative and qualitative methods can provide a more sophisticated and in-depth understanding of the studied subject than using one method alone (Doyle et al., 2019). The aim of this project was to explore social media drug markets and their use in New Zealand in the absence of existing domestic research on the topic. A mixed methods approach was chosen to facilitate understanding of this emerging trend (Bryman, 2006, 2008).

Secondly, a mixed methods approach complements a critical realist philosophical framing (Creswell & Plano Clark, 2011; Mukumbang, 2021; Shannon-Baker, 2015). Critical realism straddles positivist and constructivist ideologies, providing support for the combining of qualitative and quantitative findings for the purposes of ameliorating or addressing the methodological limitations of each (Shannon-Baker, 2015, See Section 3.3). Mukumbang (2021) suggests that critical realism offers researchers across disciplines a more ontologically grounded alternative to the paradigm of pragmatism often championed by mixed methods researchers (e.g., Creswell et al., 2003; Shannon-Baker, 2015). The partiality of critical realist conceptions of reality also supports the use of diverse viewpoints and ideas as part of the research process. In this project, the facilitation of multiple perspectives links back to the interdisciplinary theoretical framework presented in Chapter 3.

The mixed methods approach taken was an explanatory sequential mixed methods design (e.g., Creswell et al., 2003; Ivankova et al., 2006; Snelson, 2016). In this case, an initial quantitative strand – NZDTS survey data – was used to inform and develop a later qualitative strand of data collection – online interviews. Observational data collection constituted an emergent element of this mixed methods design, as further discussed below and in Section 4.4. Qualitative interview data are prioritised in this thesis. This approach contrasts with what is typically the prioritisation of the quantitative strand in an explanatory sequential mixed methods design (Creswell et al., 2003; Ivankova et al., 2006). The lack of existing research on social media drug markets domestically meant I wanted to capture the contexts, experiences, and perceptions of social media drug trading. As such, I prioritised the qualitative strand of this research, which was better suited to generating more contextualised and richer exploration of the topic. Survey data was used to sketch the contours of social media drug trading across New Zealand (Section 4.1.1), helping to craft a more in-depth and nuanced picture using interview data (Section 4.1.2) (Kendall, 2008). As such, both methods were integrated to answer the overarching exploratory objectives of this PhD (Plano Clark & Ivankova, 2017).

Though the initial plan included only survey and interview data, the opportunity arose to collect observational data once interviewing had commenced, prompting me to add this as an additional method. For this reason, I classify my mixed methods design as emergent rather than fixed (Creswell & Plano Clark, 2011; Plano Clark & Ivankova, 2017). Observational data was collected concurrently with the online interviews. The development and integration of this additional method is discussed in more detail in Section 4.1.3.

Using a sequential mixed methods design allowed for the broad scoping of social media drug markets in New Zealand, helping to identify unanticipated trends or issues to further explore in later interviews (Ivankova et al., 2006; Plano Clark & Ivankova, 2017). One such example was the use of Discord drug servers, which I had initially been unaware of prior to commencing survey data collection. The survey design allowed respondents to specify platforms or apps they had used for drug trading in the previous six months that were not already listed using an open text field. Ongoing monitoring of open text field responses as the survey progressed and the significant numbers of respondents specifying drug purchasing via Discord led to the addition of this platform as an option on the fixed list. I was then able to further explore the use of Discord drug servers in online interviews and through observational data collection, the results of which are presented in Chapter 6.

Integration of data sources occurred at two points in this research. Firstly, in keeping with the sequential study design, findings were integrated during the data collection phase to help guide the structuring of interview schedules. Secondly, findings across data sources are integrated as part of Chapter 10, which presents the discussion and conclusions of this research. Table 3 provides an overview of the findings chapters and their relation to different methodologies. Additionally, Figure 7 (p. 80) presents an overview of the data collection and analysis process undertaken in this study.

Table 3: The relationship between different thesis chapters and methodologies in this project.

Data collection method	Data analysis method	Chapter number and title of the research paper
NZDTS survey data	Statistical modelling of survey data	Chapter 5: <i>Predictors of using social media to purchase drugs in New Zealand: Findings from a large-scale online survey</i>
Messaging-based online interviews	Thematic analysis of interview data	Chapter 6: <i>The use of Discord servers to buy and sell drugs</i>
		Chapter 7: <i>'Choice' of social media platform or messaging app to buy and sell illegal drugs</i>
		Chapter 8: <i>"I just straight up criminalized myself on Messenger": Law enforcement, vulnerability and online risk management among people who buy and sell drugs on social media.</i>
		Chapter 9: <i>Social networking and the potential for harm</i>

		<i>minimization in social media drug markets</i>
Observational data	Covert observations used to support thematic analysis of interview data	Chapter 6: <i>The use of Discord servers to buy and sell drugs</i>

4.2 NZDTS survey

The New Zealand Drug Trends Survey (NZDTS) is an annual survey of New Zealanders who use drugs (2018-present) conducted by the Drugs Team at the SHORE & Whāriki Research centre (See also, Wilkins, Romeo, et al., 2018; Wilkins et al., 2020). It is an anonymous online survey that uses convenience sampling to collect data on a broad range of drug use, purchasing and perception-based trends across New Zealand drug markets. The survey design focuses predominantly on respondent drug use and purchasing over the previous six months.

As part of the development of the questionnaire for the 2020 iteration of the NZDTS survey, I developed a survey module on respondent engagement with social media and messaging apps for drug purchasing. As part of this module, respondents who indicated having purchased a drug type from a social media “location” in the previous six months were asked to specify which platforms or apps they had used to do so. Participants could indicate more than one option and use the included open text field to add platforms and apps not already included in the fixed list. They were also asked to indicate the perceived advantages of using social media for drug purchasing. An open text field was also included as part of this question to allow for additional answers. These questions were aimed at providing a broad overview of social media drug market engagement in New Zealand. Meanwhile, the use of open text fields helped to ensure alternative platforms were not omitted (e.g., Discord), and allowed for additional flexibility in respondent reporting of perceived advantages (See Chapter 5 for information on open-text field responses for apps used in the previous six months, and Appendix C for open-text field responses on perceived advantages). The results of this section, coupled with statistical modelling of survey data (Section 4.2.1), were used to inform the content and scope of the subsequent qualitative interview schedules.

NZDTS recruitment for the 2020 iteration was carried out via a targeted Facebook promotion campaign. The promotional campaign targeted people residing in New Zealand who were aged 16 years or older and had indicated interest in activities or entertainment options associated with a greater likelihood of drug use; for example, alcohol brands, particular music genres and activities related to the night time economy more generally (Forsyth et al., 1997; Van

Havere et al., 2011). Considerable research has explored the usefulness of Facebook as a targeted recruitment tool for online surveys (e.g., Boas et al., 2020; Kapp et al., 2013; Ramo & Prochaska, 2012). Antoun et al. (2016) describe Facebook advertising as a “push out” method of recruitment, where adverts are shown to platform users engaged in a range of unrelated online activities. They suggest this may facilitate more demographically diverse survey sampling.

Survey recruitment and data collection were carried out from late January of until mid-May of 2020. No payment or reward was offered to incentivise survey completion. The 2020 survey wave took place during the first COVID-19 lockdown in New Zealand (25 March – 13 May 2020). During the 2020 recruitment period a total of 26,121 people clicked on the survey link and commenced survey participation. Of these 2,621 responses were removed. One-hundred-and-ten were duplicates (the process of identifying these is discussed below), 826 were insufficiently complete (e.g., 15% complete, only demographic questions answered), and 1,685 were removed for either leaving age unspecified, or entering an age under 16 or over 90. This left a total sample of 23,500 survey responses. The median time taken to complete the survey was 17 minutes.

The need to prioritise participant safety from a digital trace perspective has been highlighted as an increasingly important aspect of online survey design (Miller & Sønderslund, 2010). To avoid collecting respondent IP addresses, each response was saved using a unique non-reversible hashed and truncated variable derived from respondent IP addresses (e.g., the generated variable could have been derived from thousands of different NZ IP addresses, making it impossible to identify one specifically). The actual IP address was discarded immediately, and the key used to generate the unique variable for each respondent erased at the end of the data collection period. These variables were also used to identify potential duplicate responses originating from the same IP address. A unique variable indicated a unique IP address. In cases where different responses were linked to a matching variable, they were manually checked to investigate the likelihood they were duplicates or merely different survey responses from multiple people using the same device or IP address to complete the survey. In cases where complete duplication was confirmed, the most complete response was kept.

The survey received ethics approval from the Massey Human Ethics Committee (Application code: SOA 17/43).

4.3 Messaging-based online interviews

The qualitative interview is a well-established and commonplace data collection method well-suited to exploratory projects (Kelly, 2012) and often used in combination with a quantitative strand in mixed methods research (e.g., Brinkmann & Kvale, 2015; Bryman, 2006; Kendall, 2008; Snelson, 2016). However, as digital technology has become more entrenched in how people communicate, an increasing number of qualitative researchers have come to recognise the potential of digital communications technologies such as instant messaging clients and apps as vehicles for interviewing research participants (e.g., Gruber et al., 2008; Kazmer & Xie, 2008; Stieger & Göritz, 2006). Instant messaging has been found a particularly useful way to engage younger age groups, for whom messaging is often a preferred mode of communication in contrast to phone calls or face-to-face interactions with strangers (Gibson, 2022; Mason & Ide, 2014). Additionally, research involving hard-to-reach populations and sensitive research topics has also benefited from the potential for anonymity provided by the internet, which may help to facilitate more open self-disclosure (Coomber, 2011; Opdenakker, 2006; Pearce et al., 2014). As such, there now exist numerous examples of the instant messaging method being used to interview people who use drugs (Barratt, 2012), and people who buy and sell drugs via social media (Bakken, 2022; Demant et al., 2019; Moyle et al., 2019).

This study used the encrypted messaging app Wickr Me (hereafter termed Wickr) to carry out anonymous messaging-based online interviews with people who used social media to buy and/or sell drugs in New Zealand. I used a two-stage interview process in which participants in initial interviews were invited to take part in a non-obligatory follow-up interview six months after their initial interview. Follow-up interviews were aimed at supplementing data from initial interviews, providing me with an opportunity to fill in gaps, ask additional questions that had emerged out of other interviews and confirm initial interpretations of the data (See also, Søggaard et al., 2019). A total of 44 interviews (comprising 33 initial interviews and 11 follow-ups) were completed during the data collection period for this project (July 2020 – September 2021).

Messaging-based online interviews were selected over face-to-face interviews for several reasons. Firstly, the relevance of the social media and messaging app setting to the research topic became an incentive for using social media platforms and messaging apps as both recruitment and data collection tools, to maintain “contextual naturalness” (Kazmer & Xie, 2008, p. 259; Salmons, 2012). Secondly, messaging-based online interviews provided a convenient and low-cost means of broadening my interview sample to enable participation from people across New Zealand (e.g., Davis et al., 2004; Stieger & Göritz, 2006). Thirdly, the hard-to-reach nature of the

target population and the need for privacy and discretion around the research topic both elevated the importance of secure platform features and meant being able to take part anonymously would likely reduce barriers to participation (Opdenakker, 2006). Lastly, I anticipated that many of my participants would be younger in age (e.g., < 25 years), and as a result might feel more comfortable sharing their experiences via instant messaging as opposed to via a phone call or face-to-face (Gibson, 2022; Mason & Ide, 2014; Shapka et al., 2016).

The encrypted messaging app Wickr was chosen for two reasons. Firstly, Wickr offers users a range of security features important to maintaining participant confidentiality and anonymity given the nature of the interview topic. Wickr messages are end-to-end encrypted by default, and a message timer of 6 days is automatically applied to messages when a new chat is started. Additionally, and importantly for this research, Wickr is the only platform of the three encrypted messaging apps that feature in this project (Wickr, Signal and Telegram) to offer username-based sign up without requiring the input of a phone number to validate accounts. In-depth discussion of the selection of Wickr as the interviewing tool in this project is presented in Section 4.3.2.2. Secondly, this platform has been used to interview social media buyers (Moyle et al., 2019) and sellers across Scandinavia (Demant et al., 2019), as well as cannabis purchasers using the cannabis website *LeafedOut* in Australia (Childs et al., 2022). As such, the platform has a proven track record with interviewing people involved in digital drug trading.

The qualitative strand of this project received ethics approval from the Massey Human Ethics Committee (Application code: SOA 20/22).

4.3.1 Recruitment strategies

Purposive sampling has been widely used to recruit research participants from hard-to-reach or hidden populations, facilitating engagement with a range of subgroups within the target population (Miller & Sønderlund, 2010; Sifaneck & Neaigus, 2001; Watters & Biernacki, 1989). I used a purposive approach to identify digital and non-digital recruitment locations. Locations were chosen based on whether they were likely to be accessible to me as a researcher, and whether posted adverts were likely to be seen by people who would be interested and eligible to participate in interviews. This involved both a broad and narrow targeting approach to identifying recruitment locations. Narrow targeting involved recruitment from explicitly drug-related online communities, such as cannabis-related Facebook groups (e.g., Barratt, Potter, et al., 2015). Broad targeting involved recruitment via groups that were not explicitly drug-related but which had a higher likelihood of membership bases involved with drug use (e.g., electronic music groups,

festivals) (e.g., Lim et al., 2010), or a sufficiently large local membership base to ensure the advert was seen by a broad range of people (e.g., NZ regional subreddits). The details of each of these locations and relative success of the corresponding recruitment drive are presented in more detail below. Purposive identification of recruitment locations was combined with a self-selection approach to sampling (Sharma, 2017). As such, only one recruitment location – the festival – involved directly approaching people to take part in the study. However, prospective participants were required to approach me on Wickr (See Section 4.3.2.1 and 4.3.2.3). The research implications and limitations of this combination of sampling approaches are discussed in more detail as part of Chapter 10 (Section 10.5).

Recruitment of interview participants was carried out from late July 2020 through to late February 2021. Table 4 presents an overview of the different recruitment strategies used during this time including estimates of approximate audience exposure generated via each method and the number of interview participants generated. As shown in Table 4, a total of 33 interviewees participated in the interviews. Though both digital and non-digital recruitment methods were used, most participants (n=31) were recruited via digital methods. The details of each recruitment strategy are discussed in detail below:

Table 4: Engagement and participation generated across different recruitment sites.

Recruitment strategy	Timeframe	Methods of engagement	Estimated audience advert exposures ⁵	Participants recruited
Digital				
<i>Facebook</i>	July-October 2020	FB Groups	16, 700	2
	August 2020	Researcher's personal Facebook network	300	1
<i>Reddit</i>	July – October 2020	Subreddits	317, 600	12
<i>"KnowYourStuff" (KYSNZ)</i>	February 2021	Study advertised across KYSNZ's social media (Twitter, Instagram and Facebook).	25,000	16
Non-digital				

⁵ Exposure figures are based on approximate group and subreddit membership counts at the time of recruitment. For KYSNZ recruitment, exposures are based on the organisation's follower count across their social media presence. These numbers do not consider whether all group members or account followers saw the advert. Festival recruitment exposures are based on the number of leaflets handed out.

<i>Festival recruitment</i>	January 2021	Handing out leaflets outside festival grounds	150	2
			Total audience exposures: 354,700	Total participants: 33

1. *Facebook*: Originally, I had planned to target Facebook groups related to drug use (cannabis and psychedelics) or music genres like Techno, Drum and Bass and Dubstep to advertise the study. However, this proved challenging and did not generate the levels of participation anticipated. I identified 33 relevant Facebook groups in New Zealand. In each instance, I asked to join the targeted Facebook group and sent a message to one of the group administrators outlining my role as a researcher, the research topic, and asking if I could advertise to group members. If group membership was granted, but no response was received from group administrators within a week, I posted an advert to the group (see Appendix D). Often posts were first sent to administrators for approval, which meant that they could decline to post my advert at this stage, and many did. The research focus on people’s experiences buying and selling drugs on social media proved a barrier to posting adverts on Facebook. Many group administrators were reluctant to allow me to post study adverts to their groups given they often explicitly banned the sale of substances among group members (Barratt, 2017). In the case of music-focused groups, many felt the study topic was inappropriate given the group orientation and perceptions of drug-related studies in this environment as unfairly stereotyping group members as ‘drug users’ (Barratt & Lenton, 2010). In many cases my membership request was not approved by group administrators, my messages were not responded to, or my adverts were deleted shortly after posting. Member engagement with adverts once posted was also negligible. In total, 33 different Facebook groups were contacted for the purpose of advertising the study, but only 13 adverts were posted, and 2 participants generated. During this time, I also shared a study advert across my own personal Facebook network, which was reposted by several Facebook friends, generating one additional participant.
2. *Reddit*: Recruitment on Reddit proved more successful than on Facebook. In total, eight subreddits were targeted for advertising, and seven adverts were successfully posted. I focused on local subreddits related to drugs (r/NZtrees – cannabis), or for general discussion of national and local news and events (e.g., r/newzealand, r/auckland, r/chch, etc.). A similar process was followed on Reddit as on Facebook, where I approached

subreddit administrators asking for permission to post an advert for my study and waiting for their approval before doing so. Adverts posted on Reddit received more engagement from the respective communities than on Facebook, and I received more messages on Wickr. Engagement with reddit posts also provided me with an opportunity to add additional information and answer questions relating to the study (Barratt & Lenton, 2010). However, a primary drawback to reddit recruitment was the frequency with which my Wickr username was taken out of context and reposted to other, predominantly porn-related, subreddits. This resulted in many non-study-related messages and a substantial amount of time spent tracking down and removing these posts. Despite these frustrations, 12 participants were recruited via Reddit.

3. *Festival recruitment:* In January 2021, leaflets advertising the study were handed out to people attending an electronic music festival in Auckland. The festival organisers were emailed to let them know leaflets would be passed out to attendees as they entered the festival grounds. My co-supervisor Dr Marta Rychert and I approached people outside the entrance to the festival grounds, introducing ourselves and the study topic and gauging their interest in taking a leaflet. In total, 150 leaflets were handed out and subsequently 2 people contacted me via Wickr, both of whom completed the interview.
4. *“KnowYourStuff” (KYSNZ):* KYSNZ is a volunteer-led organisation providing free drug checking at music festivals and pop-up clinics across New Zealand’s major cities (<https://knowyourstuff.nz/>) (See also, Hutton, 2022a). KYSNZ drug checking ‘clinics’ are advertised across the organisation’s social media presence, encompassing pages on Facebook, Twitter, and Instagram. The organisation has a substantial social media following, with over 3,000 followers on Twitter (as of November 2022), more than 8,000 on Instagram, and almost 14,000 on Facebook. In February 2021, I was able to arrange for study adverts to be posted across KYSNZ’s social media accounts, which proved a particularly fruitful and targeted recruitment method, generating substantial engagement and the remaining interview participants (Table 4). This likely reflected several factors, in particular an ability to more specifically target people who use or are interested in using drugs given the nature of KYSNZ services and content. This contrasted with the broader targeting approaches I used both on Facebook and Reddit, where the nature of my research topic was sometimes difficult to reconcile with a broader, non-drug related group orientation. The ability to advertise on Instagram may also have helped to increase

audience exposures across a broader range of groups owing to this platform's popularity among younger age groups (Pew Research Center, 2018). In the days after the posting of my advert the number of messages I received from prospective participants outpaced my ability to schedule and complete interviews. As a result, I asked prospective participants whether I could temporarily record their Wickr username in a secure file and send them a message on Wickr to arrange an interview at a later date. The file was stored on a password-protected Massey hard drive and encrypted using Veracrypt software (See also Section 4.1.2.2), for which only I had the decryption keys. I deleted the stored usernames as I reconnected with interview participants and arranged interviews.

To facilitate trust in my identity as a researcher and the legitimacy of the research, I chose to make my identity verifiable to prospective participants as part of the recruitment process (Barratt, 2012; Barratt & Maddox, 2016; Salmons, 2018). I did this by making connections between study adverts, my Wickr handle and my PhD student profile accessible on the SHORE & Whāriki website. For example, I used the same student profile photo across both my research-related Facebook account and my Wickr account. I also selected a username on Wickr that contained my initials and my links to Massey ("rvdsmassey"), using the same handle as my username on Reddit. In this way I made it easy for participants to verify or 'fact-check' my role as a Massey University PhD student if they wanted to. Salmons (2018) has argued that this type of credibility establishment is crucial to the success of online research: "*If a potential participant searches for the researcher's name and does not discover evidence of scholarship, it will be difficult to build trust in the research project*" (p. 116).

I realised there was some personal risk involved in taking this approach to recruitment, particularly given I was identifying myself as a female researcher, which can result in unwanted attention from male research participants (e.g., Barratt & Maddox, 2016). Though this did not occur, I took steps to ensure my personal social media accounts were private and not easily linked to my Massey researcher profile. However, equally, given the nature of the research topic, and the anonymity of the research process, I felt that putting a 'face' to the project would improve participant ability to relate to the researcher 'behind the screen' (Crowley, 2007). It seemed likely this would increase both willingness to participate and more open disclosure during interviews. It may also be the case that my openness about my identity, particularly my gender, may have influenced the relatively higher than expected number of interview participants identifying as female in this project (n=10, N=33). This is notable as research on drug trading often predominantly involves male participants (e.g., Denton & O'Malley, 1999; Fleetwood et al., 2020).

Hence, it may be this group felt more comfortable talking to a researcher with similar demographics to their own about their involvement in social media drug markets.

4.3.2 Interview process

4.3.2.1 Interview protocols and structure

Interviews took place from late July 2020 to early April 2021, with follow-up interviews conducted from late January 2021 through to October 2021. In total 33 participants took part in initial interviews, and 11 of these took part in the follow-up stage. To take part in an interview, prospective participants needed to be aged 16 or over, and have some previous experience using social media to buy and/or sell drugs in New Zealand.

In this project, prospective interviewees were required to initiate contact with me on Wickr. This contrasts with the approach taken by Bakken (2022), where prospective interviewees were actively solicited based on their involvement in social media drug markets. In a few cases, prospective participants reached out on Facebook, Reddit, or via my institutional email address (which was included on the advert for general enquiries). In these instances, I replied with a link to the PDF version of the participant information sheet about the study (Appendix E) hosted on the SHORE & Whāriki website, but requested they reconnect with me through Wickr if they decided to participate. A link to the Wickr website (and app download) was included for reference.

I developed a list of protocols (Appendix F) to structure the interview process and ensure informed participation and consent. Upon receiving a message on Wickr, I responded by sending a link to the participant information sheet, asking prospective participants to confirm with me on Wickr if they were still interested in participating once they had read it. Once I received confirmation of their willingness to participate, I confirmed their eligibility to take part (e.g., age), confirmed the initial interview would take place via instant messaging (Wickr also offers voice calling), and then proceeded to schedule a time with them to complete the interview. Though scheduling interviews was not originally part of the interviewing process, I found this to be a helpful way of trying to ensure interviews were completed reasonably promptly (Further discussed in Section 4.3.2.2).

At the scheduled interview timeslot, I sent the participant an initial message letting them know I was ready to begin, with another message sent 30 minutes later in the case of no reply. Prior to commencing the interview, I confirmed with participants whether they wanted to receive an interview transcript once the interview was completed, and then completed a consent protocol

with them. Participant answers to these initial housekeeping questions were recorded in a text file linked to their interview transcripts, and the completed consent protocol was recorded at the beginning of the interview transcript. I conducted interviews largely using Wickr's desktop client, so the process of 'saving' the interview for analysis (or "transcribing") involved copy/pasting chat logs into a word document. The transcript was formatted effectively immediately to replace participant usernames with a project-specific pseudonym, as well as removing unnecessary metadata (e.g., time zone designations). Message logs were automatically deleted once the chat message-timer elapsed.

Upon completion of initial interviews, participants were sent a copy/pasted message containing information around data use and storage, as well as researcher contact details (see Appendix F). They were also asked if they would permit their Wickr username to be stored for a period of six months for the purposes of completing a second, non-obligatory follow-up interview. All but one participant agreed to be recontacted. Usernames were stored in an end-to-end encrypted word document (using Veracrypt software) kept on a password-protected Massey University hard drive. I was the only one with the password to decrypt the file. The file contained participant usernames, the date of their initial interview and the projected date at which the six-month storage period for their username would elapse. An additional column noted whether the participant had been contacted for a follow up interview, and whether this had been completed. Two follow-up reminders were sent via Wickr approximately one week apart. In cases of no response, the Wickr username was then deleted from the file. Follow-up interviews were guided by the same sequence of protocols as the initial interviews (Appendix F).

To recognise interviewees' contribution to the study and thank them for their time, supermarket vouchers were offered for participation in both initial interviews (\$30NZD) and follow-up interviews (\$20NZD). The advantages and disadvantages of providing compensation to research participants are much debated (e.g., Head, 2009). However, in the context of this project, I felt it was appropriate given the need to incentivise participation, prevent attrition, and compensate participants for the length of time taken to complete messaging-based interviews (See Section 4.3.2.2). Vouchers were delivered via post after being offered to participants prior to interviews commencing, with postage arranged once the interview was completed. To avoid gathering personal information and addresses as part of the compensation process, I asked participants to send an address for the voucher using Wickr's burn-on-reading message timer. Burn-on-reading messages expire within a minute of opening, giving me time to copy the address onto an envelope, after which point the message content was no longer available. No names were required.

As discussed in Section 4.1, initial interview schedules were informed by the results of the NZDTS survey (Section 4.2), combined with a review of existing literature on social media drug markets. Early schedules were adapted as interviewing progressed to encompass and respond to emerging data. I employed a semi-structured approach to interviewing (Brinkmann & Kvale, 2015), where I used several core topics to guide the interviews but allowed for substantial flexibility in responding to novel topics or experiences shared by participants. Both the initial (main) and follow-up interview schedules are included in Appendices G and H. Follow-up interview schedules were developed based on a combination of existing findings and areas I wanted to further explore with participants. The follow-up schedules also included an element of tailoring to each participant, where data from their initial interview was used to guide areas to cover in more depth during the follow-up interview (Appendix H).

Participants in follow-up interviews who resided in Auckland were given the option of carrying out their follow-up interview face-to-face or on Wickr. One participant opted to complete a face-to-face interview, which was carried out in a fast-food restaurant, with consent recorded on a voice recorder at the beginning of the interview. In this instance, I transcribed the interview manually, and the voucher was offered to the participant prior to the interview commencing.

4.3.2.2 Data quality and navigating instant messaging as an interviewing modality

Using instant messaging as an interviewing tool requires researchers to address and navigate challenges unique to this medium (e.g., James & Busher, 2009; Jowett et al., 2011). As such, the following section discusses the nuances, difficulties, and advantages of messaging-based online interviews I encountered as part of this project, as well as addressing questions around data quality often associated with this method.

The length of time taken to complete message-based online interviews has been discussed by other researchers as a challenge to maintaining participant and researcher focus and ensuring interview completion (Davis et al., 2004; Jowett et al., 2011; Opdenakker, 2006). Norms of message communication can mean that interviews continue for days at a time, with interviewees answering questions throughout their day, or while multitasking (Barratt, 2012). This can impact the quality of participant answers and increase the risk of interview non-completion or 'interviewee fatigue' as time drags on (Kendall, 2008). Lack of researcher control over the interview environment has therefore also been highlighted as a potential challenge in message-based interviewing (Kazmer & Xie, 2008; Opdenakker, 2006).

To facilitate more attentive and structured interviews with participants, I used scheduling of interviews as a tool to try and ensure interviewees were prepared, ready to answer questions and focussed on the interview process (See also, Bakken, 2022). Scheduling was also beneficial for me as the interviewer, as I could build more focus and flow in the interview conversation when it was carried out near-synchronously as opposed to asynchronously (Salmons, 2012). Though instances of distraction and long periods of non-communication were not entirely avoided by scheduling interviews, I could generally rely on scheduled interviews to be completed in one or two sessions comprised of several hours as opposed to several days. The median time frame in which interviews were completed was 3 hours, with the shortest taking 1.5 hours and the longest five days to complete. This contrasts with the face-to-face follow-up interview I carried out with one participant (Section 4.3.2.2), which took only 45 minutes. Only one participant failed to complete their initial message-based interview. However, this interview was included in subsequent analysis as a large portion had already been completed. The flexibility and ongoing nature of message-based interviews also proved challenging for me as the interviewer, particularly as it meant I was often fielding interview messages throughout my day regardless of whether I was prepared or at my laptop. As a result, I often hybridised my use of Wickr as a mobile messaging app and desktop messaging client, continuing interviews across both devices. In this vein, I appreciated the flexibility of instant messaging as a medium but acknowledge it could impact on the level of attention given to the interview process, both by participant and interviewer (Opdenakker, 2006).

The issues of multi-tasking and time taken to complete a message-based online interview both feed into one of the core criticisms of this method – the belief that the data generated is inferior in quality compared to the qualitative “*golden standard*” of face-to-face interviews (Gibson, 2022, p. 4). Researchers argue that message-based online interviews lack contextual cues such as facial expression, tone of voice and body language, which help to convey information and enrich data in face-to-face settings (Kendall, 2008; Pearce et al., 2014). The loss of these additional sources of information can make it difficult to establish rapport with interviewees, thereby increasing the ambiguity of interview data and impacting on data quality (Davis et al., 2004; Opdenakker, 2006). Other researchers have argued that this paves the way for deliberate misrepresentation or fabrication of responses by participants, who can self-present as they wish in an anonymous online setting (Markham, 2011; Pearce et al., 2014). Message-based responses are often typically shorter than responses to interviewer questions in face-to-face settings, generating shorter interview transcripts and a loss of data ‘quantity’ (Davis et al., 2004; Jowett et al., 2011). In this project, the median length of interview transcripts was nine pages, with the

longest being 18 and the shortest seven. The one face-to-face interview generated a 13-page transcript. Follow-up interviews therefore provided a means of increasing the 'quantity' of interview data. Though this was valuable given it allowed me to explore additional areas of participant experience and check interpretations of existing interview data, increased data quantity was not per se necessary given the high quality of messaging-based interview data.

Comparisons between face-to-face and message-based online interviews in terms of data quality and resulting themes has found both methods, though each with their own nuances and inflections, generate comparable data equivalence (Shapka et al., 2016). Researchers highlight the potential for direct messaging to allow participants to convey information more precisely and reflexively as they construct answers to interview questions (James & Busher, 2009). Furthermore, emojis and the structure of messages can be used to convey contextual information via messaging (Jowett et al., 2011; Opdenakker, 2006). In my experience, though the transcripts generated from the message-based interviews were shorter than the transcript generated from the face-to-face interview, I found the interview data to be of high quality and rich in detail (See also, Gibson, 2022; Pearce et al., 2014). As the interviewer I felt I had more time to construct additional questions and think about participant responses (See also, Pearce et al., 2014). As such, concise, short interview responses from participants and decreased transcript length were not necessarily indicative of lower quality, but rather often more information condensed into fewer words.

In most cases, I did not find it difficult to build a sense of rapport with participants via messaging. This contrasts with what other researchers have identified as a key challenge of using online messaging to carry out interviews, where navigating the flow of conversation in the messaging medium and an inability to convey contextual cues or practice 'active listening' can be experienced as difficult (Kazmer & Xie, 2008; Markham, 2011). In the context of this research, my participants and I were arguably all 'digital natives' to varying extents. As such, we were highly familiar and skilled at using messaging as a central communicative tool in our daily lives. As part of this 'digital nativity' there was a higher level of awareness of what are now often well-established (though non-homogenous) social norms around the use of messaging as a communication medium, which made it easier to build rapport (Kazmer & Xie, 2008). Here, issues like multi-tasking and overlapping messages were navigated as a normal part of a messaging conversation, and did not per se inhibit the development of a relationship between interviewer and participant. This could also be linked to my decision to employ a level of openness about my identity and demographic attributes (Section 4.1.2.1), which may have helped participants feel comfortable with the research process. Researchers have suggested that message-based online interviews can lower power imbalances between interviewer and participant, particularly in

instances involving young people or adolescents (Gibson, 2022). In this project, my use of asymmetric anonymity, whereby I was identifiable but participants were not, may have helped to facilitate greater feelings of participant control over the interview process in general, leading them to be more forthcoming in their interview responses.

It may also be that many researchers underestimate the level of messaging-style personalisation people can develop, which becomes a useful vehicle for generating cues and enriching message-based communication. In this project, each participant had a different manner of typing and expressing themselves on Wickr (as is evidenced in the interview excerpts used throughout this thesis). For example, some participants answered interview questions by sending multiple, short separate messages, while others sent paragraph answers. Navigating these differences could prove challenging, especially initially when I was not yet familiar with their style of messaging, leading me to 'type over' participants as they answered my questions, thereby disrupting the flow of the interview (Bakken, 2022; Davis et al., 2004; Kazmer & Xie, 2008; Markham, 2011). However, adapting to different typing styles provided an important sense of context and means of relating to participants that helped me get a feel for the person behind the screen. Markham (2011) describes this as a need to focus on message *form* rather than purely message *text*. For example, if participants typed 'expressively' using emojis and the like, I would similarly increase the number of emojis I used (See also, Bakken, 2022). Alternatively, I used humour to relate to participants, responding to any jokes they made or making space to veer 'off topic' for a short time if it felt appropriate to the interview context (Barratt, 2012). Rapport was more evident in follow-up interviews, where participants were often immediately more informal and 'friendly' in their communication due to already established familiarity with me as the interviewer.

4.3.2.3 Selecting a messaging tool

A final important note on the complexities of message-based online interviews concerns the selection of an appropriate interviewing tool. As previously discussed, from an ethical perspective my choice of Wickr as the interviewing tool was particularly important in protecting participant identity and ensuring they could safely communicate with me. However, as the interviewing progressed, it became apparent that recruited participants were either already familiar with and using Wickr for drug trading, or alternatively, they had never heard of Wickr and had to download it to take part in the research.

At several points throughout the recruitment process I received requests from would-be participants or recruitment group and subreddit administrators asking me to broaden the range

of platforms I was using for interviewing. They argued that I needed to make sure I was available across the broad range of platforms people were using for drug trading. This was a valid point, particularly given researchers have cautioned that the selection a specific messaging tool is likely to influence the attributes of the final interview sample as different groups use different platforms (Gibson, 2022; Stieger & Göritz, 2006). Indeed, several examples of researchers carrying out message-based online interviews document offering participants a range of different messaging apps or software to choose from, or a range of interview modalities (e.g., phone, face-to-face) (Bakken, 2022; Jowett et al., 2011). However, in the context of this study, the need to prioritise participant safety and anonymity meant I needed to ensure interviews took place on a secure messaging app that facilitated anonymous interactions. Though other secure messaging apps like Signal and Telegram also facilitate secure communication capabilities, as discussed in Section 4.3, both apps require users to sign up using a phone number⁶ (*Signal Support: Security, 2023*; Telegram, 2022). I was therefore reluctant to use these apps in case participants accidentally shared contact details with me during the research process.

However, I was also mindful that nuances or complexities of app features and design (see Chapter 2) could perhaps deter participation among people who were otherwise not familiar with secure messaging apps. For example, the need to enter a phone number on Telegram or Signal would have increased participant concerns that their personal information might be visible to others, including the police (See Chapter 8), thereby disincentivising participation despite other security features offered by the platforms. Moreover, on Telegram, only secret chats are end-to-end encrypted (Telegram, 2022), akin to Messenger secret chats. In this vein, Wickr's automatic application of end-to-end encryption and message timers to all chats facilitated a streamlining of participant engagement with the interview process by decreasing time spent ensuring participants were using the correct app settings. This factor may have been particularly important in facilitating participation from people who did not already use Wickr for drug trading.

Undoubtedly, my selection of Wickr as the interview medium played a role in shaping my sample attributes, given a high number of participants used Wickr specifically for drug transactions, while other encrypted apps like Signal featured less frequently. This factor is discussed in more depth as part of Section 10.5, which outlines the research limitations. However, the ease with which Wickr could be used securely without the need for prior knowledge of the

⁶ Both platforms use this feature to validate user accounts and prevent the creation of fake accounts by bots. Telegram allows for anonymous username-based messaging once initial account verification has been completed. However, on Signal, though usernames can be set, a phone number may still be displayed to others when messaging or calling.

platform was also likely an important factor in shaping how recruitment took place and facilitating my engagement with a diversity of participant perspectives and experiences of social media drug markets in New Zealand.

4.4 Observational data collection

As discussed in Section 4.1, observational data collection was added to the mixed methods design of this research partway through the interview phase. In this project, observational data pertains specifically to *one* platform – Discord. The use of Discord servers⁷ for drug trading was rapidly emerging during the period in which I was carrying out interviews (See Chapter 6). I completed several interviews with participants who used Discord to access drugs and created a Discord account to join several easily accessed Discord servers linked to some of the Reddit communities I had used to recruit participants (e.g., r/newzealand). This helped me get a sense of how Discord servers worked, their features, and the types of communication dynamics they enabled. Being able to join and observe a functioning drug server provided a way to gain a better understanding of this emerging social media drug market trend. As such, when an interview participant offered to share several invite links⁸ to Discord drug servers with me, I joined and began observing these groups directly.

Using these participant-provided invite links I joined three drug servers in October 2020. I spent several weeks familiarising myself with their layout and observing member activity and interaction prior to commencing data collection. This helped me to develop a sense of the general attributes and themes of the drug server environment and guided my approach to collecting observational data (e.g., Childs et al., 2022; Ferguson, 2017b). Additionally, new drug servers were easily joined once membership to one drug server had been obtained as invite links for other drug servers were routinely posted across existing ones (See Chapter 6). This meant that January 2021, my membership had expanded to seven drug servers, on which I would be collecting observational data. Additional information on each of these servers is included in Appendix H.

I chose to use a non-participatory observational data collection style – “lurking” – to engage with the drug servers. “Lurking” presents researchers with a valuable method of gathering online data on these communities as they function and exist ‘naturally’, undisturbed, or uninfluenced by an overt researcher presence (Ferguson, 2017b). As such, it allows researchers to

⁷ Discord uses the term ‘servers’ to designate the communities that users can establish on the platform.

⁸ To join a Discord Drug server a valid invite link is needed. These can only be shared by existing members – see Chapter 6.

benefit from what Enghoff and Aldridge term “unsolicited data” (2019). In online drug markets, unsolicited data are generated via user interactions with the marketplace and with one another, which then provide valuable sources of research data given their creation is separate from the research context (Enghoff & Aldridge, 2019). The ethics of “lurking” as a form of online data collection, and its validity in generating ‘thick’ qualitative data as a standalone ethnographic method have been much debated (e.g., Ferguson, 2017b; McKee, 2013; Paechter, 2013). This reflects increasing recognition of the “messy web” (Postill & Pink, 2012, p. 125), where defining what constitutes public or private online space is often not clearcut, requiring researchers to think carefully about what data is being collected and in what context it will be used (e.g., Berning & Hardon, 2019; Gibbs & Hall, 2021; Hennell et al., 2020; McKee, 2013; Zimmer, 2010). Growing recognition of digital technologies and communities as constituting social spaces in their own right has increased calls for active engagement with them throughout the research process (Barratt & Lenton, 2010; Barratt & Maddox, 2016), including obtaining informed consent from community members and platform users (Hennell et al., 2020).

In this study, I chose to observe Discord drug server activity covertly for several reasons. Firstly, based on accounts of Discord generated by previous interviews, I understood that the type of Discord drug server I would be observing was characterised by low barriers to entry and a general assumption that other parties, such as the police and journalists, were also already monitoring these spaces. Though technically the need to receive an invite link to become a member rendered Discord drug servers semi-public (Gibbs & Hall, 2021; Irwin-Rogers, 2019), the nuances of the Discord drug server model meant this requirement did not per se render these drug servers private. The volatility often associated with this type of drug server environment also meant that a participatory research strategy may not have been overly successful, given what was often the low cohesion of these groups and the absence of an obvious server administrator (These issues are discussed in depth in Chapter 6).

Furthermore, at this time Discord drug servers had been featured in several media articles featuring ‘insider’ pictures and accounts of these emerging marketplaces (e.g., Anonymous, 2020; Harris, 2021; Kohout, 2021; McKenzie, 2020). As such, there was growing public knowledge and awareness of Discord drug servers, which meant my observations would not lead to these groups being ‘outed’ to the public and law enforcement. The emergent nature of this data collection method also meant I was logistically constrained in the amount of time I had to plan and carry out observational data collection. A more complex participatory strategy meant I would likely need to factor in how to approach server administrators and develop a researcher profile through which to approach and communicate with the broader community, among other considerations (e.g.,

Barratt & Maddox, 2016; Gibbs & Hall, 2021). Additional details about the drug servers observed during the data collection period are included in Appendix I.

To ensure the data I collected did not identify specific server participants I used a strategy that prioritised collection of data on general server features and dynamics (See categories below). I selected additional drug servers to join based on size (more than 400 members), and did not solicit invite links from members, as is commonplace on drug servers. Rather, I only joined additional servers when invite links were posted publicly. Additionally, I avoided collecting data that included specific identifying details on users, such as posts including photos of scammers or pictures of car licence plates. Discord drug servers are predominantly pseudonymous, however I made sure the collected data did not involve accounts that clearly identified their owners. This was important given that many drug server members used personal Discord accounts that could contain identifying information (See Chapter 6 and Chapter 8). I used observational data to support, illustrate and corroborate perspectives and experience shared with me by the interview participants, rather than seeking to interpret and generate unique findings from the observational data alone (See Section 4.5.2). Data was stored on a password-protected hard drive.

Data collection commenced in mid-January 2021 and finished in mid-April 2021. The different drug servers were observed weekly and screenshots taken of server activities, which were grouped under four broad categories. These categories were constructed based on a combination of my observations in the initial period after joining the servers and preceding data collection (discussed above), and from interviews with people who used Discord drug servers:

1. *Server layouts*: This category comprised screenshots of server features and provided an overview of how drug servers were laid out (Appendix I). Additionally, screenshots of administrator announcements and activities (e.g., changes to server layout or features, and responses to queries from members) were also grouped under this category.
2. *Seller adverts*: I grouped together screenshots of seller adverts taken from the various drug selling channels⁹ on each server. Each week I would take screenshots from different selling channels on each server (servers often had separate selling channels for different drug types). I endeavoured to capture a range of different advert formats, ranging from simple and informative through to highly customised and professional.
3. *Seller reviews and buyer requests*: This category was used to record screenshots of more general chat messages posted to drug server channels. This included buyer requests for

⁹ Discord servers are comprised of different channels, which function as public group chats in which members can post and interact with one another.

certain drug types in certain areas of the city or region, as well as seller reviews, colloquially known as ‘vouches’.

4. *Scam allegations and drama*: In this category I recorded screenshots of allegations of scamming or victimisation between members, which were shared on different servers. This included warnings around scammers or gang members operating on other drug servers – these were often reposted across different drug server communities. I also included developments relating to member discussions around law enforcement, or warnings about police checkpoints and seller arrests.

In total, 570 screenshots were taken throughout the observation period. Examples of observational data from each of the four categories are included in Appendix J. Once the observational period had elapsed, I continued to monitor the servers, but this decreased in frequency and screenshots were no longer taken unless particularly important or novel developments took place. However, in late 2021, the Discord platform began more actively policing and moderating platform content and activity. As a result, many drug servers were shut down and accounts affiliated with drug servers banned. As part of these changes, my research account was also banned, suspending my ability to monitor the Discord drug server environment from November 2021 onwards.

4.5 Data analysis

4.5.1 *Statistical analysis of NZDTS survey data*

Analysis of NZDTS data (Section 4.2) undertaken to generate the findings presented in Chapter 5 used logistic regression models to explore the relationships between different demographic and drug market indicators and past-six-month use of social media to purchase drugs among NZDTS respondents. Logistic regression is a commonly used form of statistical model in the social sciences to test the relationship between different independent covariates, and an often binary dependent response variable (Hosmer & Lemeshow, 2000; Pampel, 2021). It is a non-parametric technique that allows for the modelling of data that do not fit a normal distribution, making it suitable for convenience samples such as the NZDTS (Osborne, 2015). I developed a list of covariates to apply to the models, while SHORE & Whāriki’s statistician Jose Pepe Romeo carried out the analysis using SAS software.

Separate logistic regression models were developed to predict social media drug purchasing for each drug type (Cannabis, LSD, MDMA and methamphetamine – see Chapter 5).

This approach accounted for different patterns of use and purchasing associated with each drug type, alongside the socio-demographic characteristics of different groups of respondents. Separate models also helped to account for variation in sample sizes across drug types, which streamlined interpretation of results by avoiding the need to assess interaction terms between drug types and predictor variables. A detailed description of how each drug market and demographic predictor variable was applied to the model is provided in Chapter 5 (pp. 88-90).

4.5.2 Thematic analysis of interview data

Thematic analysis was used to analyse the interview data. Thematic analysis is a flexible mode of analysing qualitative data that involves the identification and analysis of patterns – themes – in a data set (Braun & Clarke, 2006). It is broadly applicable across different epistemological positions and disciplines (Braun & Clarke, 2012). In this project, I used Braun and Clarke’s six-step framework (2006, 2012, 2022) to guide my approach to thematic analysis. This framework involves progression through a series of ‘stages’ to build a flexible yet rigorous thematic analysis. Initial familiarisation with the data (phase 1) leads to the generation of initial codes (phase 2) and the development of preliminary themes and relationships between themes (phase 3). In phase 4, themes are reviewed and evaluated, and data recoded if necessary. Phase 5 involves defining and naming themes in preparation for phase 6, where the final analysis is reported (Braun & Clarke, 2006, 2012, 2022). Progressing through these different stages is a recursive process as the researcher may move backwards and forwards between different stages at multiple points throughout the analysis (Braun & Clarke, 2006; Braun et al., 2019).

In this project, NVivo coding software was used to carry out the thematic analysis process. My application of Braun and Clarke’s six-step framework to the interview data is presented below. Phases 1 through 5 are discussed in detail below (the published research papers and this thesis constitute phase 6 – the final report):

1. *Familiarisation with the data*: This phase involved reading and coding interview transcripts by hand. Transcripts were read several times, firstly for familiarisation, before moving into coding for general information such as drug types bought and platforms used. A final re-reading of the transcripts was used to make notes of interesting points and questions for follow-up interviews, or of general importance for further analysis. I used these notes to write an in-depth interview summary for each participant as part of the interview notes associated with their transcript. In these documents, notes taken during interviews were combined with several ‘key points’, where I discussed and summarised

what I initially thought were the principal takeaways and notable features of each interview. These documents were added to the NVivo project and coded alongside the interview transcripts. Where observational data was used, I followed a similar process by printing off a broad selection of screenshots and annotating these by hand. This process fed back into further observational data collection, as I noted important features and dynamics to further observe or discuss in subsequent interviews.

2. *Generating initial codes:* Initial codes were generated using a combined deductive and inductive approach to analysing early transcripts. I used existing literature and the results of the NZDTS data analysis to help guide initial development of codes alongside findings from early interviews and the 'key point' interview summaries I developed as part of phase 1. The process of forming initial codes became steadily more inductive as interviewing progressed. During this phase I also added and coded a selection of observational data screenshots, using NVivo to link different elements of each image to different codes to complement and illustrate interview data relating to Discord. As initial coding progressed and the coding framework expanded, I refined existing code groups, and recoded material cyclically. For this reason, there was considerable overlap between this phase of the thematic analysis and phase 3 involving theme development.
3. *Searching for themes and drawing up a thematic map:* Phase 2 was used to create a 'main codes' framework, which would act as a central, organising thematic map for the qualitative arm of the project (See Appendix K). Codes were semantic, and I deliberately kept them broad, with the 'main codes' framework comprising fewer than 50 codes. I established and maintained a memo for each of the 'parent' codes in this framework. In these memos I documented changes I was making to the code and my reasons for taking certain actions, as well as taking extensive notes to document and develop my thinking around the data grouped at this code or discussing particularly important examples. This process was pivotal in identifying and developing ideas and groups of codes that could form the basis of individual publications, whilst also developing project themes. As part of this phase I developed and maintained a 'core' code for the project, where I coded data that I felt was particularly interesting or spoke to a central research theme. I ensured the coded data was heavily annotated and developed a linked memo in which I copy-pasted or discussed important notes made in other memos, or thoughts about relationships between different code groups.
4. *Reviewing themes and recoding:* As aforementioned, I recoded and refined themes cyclically from phase 2 onwards. As such, phase 4 largely extended these previous phases.

As part of reviewing themes, I printed off and arranged coded data excerpts into groups by hand. I then wrote detailed notes about each group in the relevant code group memo, and if necessary, made changes to codes or recoded data based on these groupings. This process of reviewing codes also involved 'testing' relationships between codes. At this point, I used NVivo visualisations such as word clouds and queries to check for overlap between different codes. I focused here predominantly on secondary codes (See Appendix K) to explore relationships between and across code groups in more depth. I also used NVivo concept mapping functions to visualise relationships between codes and code groups to consider the 'broader' picture of research findings.

5. *Defining and naming themes*: The process of concept mapping also shifted my analysis into phase 5 involving the defining of themes. In the respective memo for each code group, I wrote a short summary of the 'essence' (Braun & Clarke, 2006) of each code group, ensuring that I detailed the relationship between the 'parent' and 'child' codes. I also used concept maps to link together different code groups and construct frameworks of codes that captured the core findings of the project. Appendix K contains the final 'main codes' framework for this project including code descriptions.

To facilitate the write up of separate publications as part of this thesis, coding frameworks were created for each paper respectively. These coding frameworks were rooted in the 'main codes' framework overall and involved varying levels of additional refinement and reorganising of codes based on the framing of the publication and presentation of findings within it. I maintained a project "coding audit trail" (Nowell et al., 2017) in memo form in which I documented my progress coding, refining and recoding data, and any resulting changes I had made to the coding structures.

4.5.3 Literature review

A comprehensive literature review was conducted and used as a backdrop against which data collection and analysis were situated. Academic literature on drug markets (digital and non-digital) as well as social media and communications studies were reviewed prior to the development and initiation of data collection. Review of any emerging literature on these topics was also carried out throughout the course of this study.

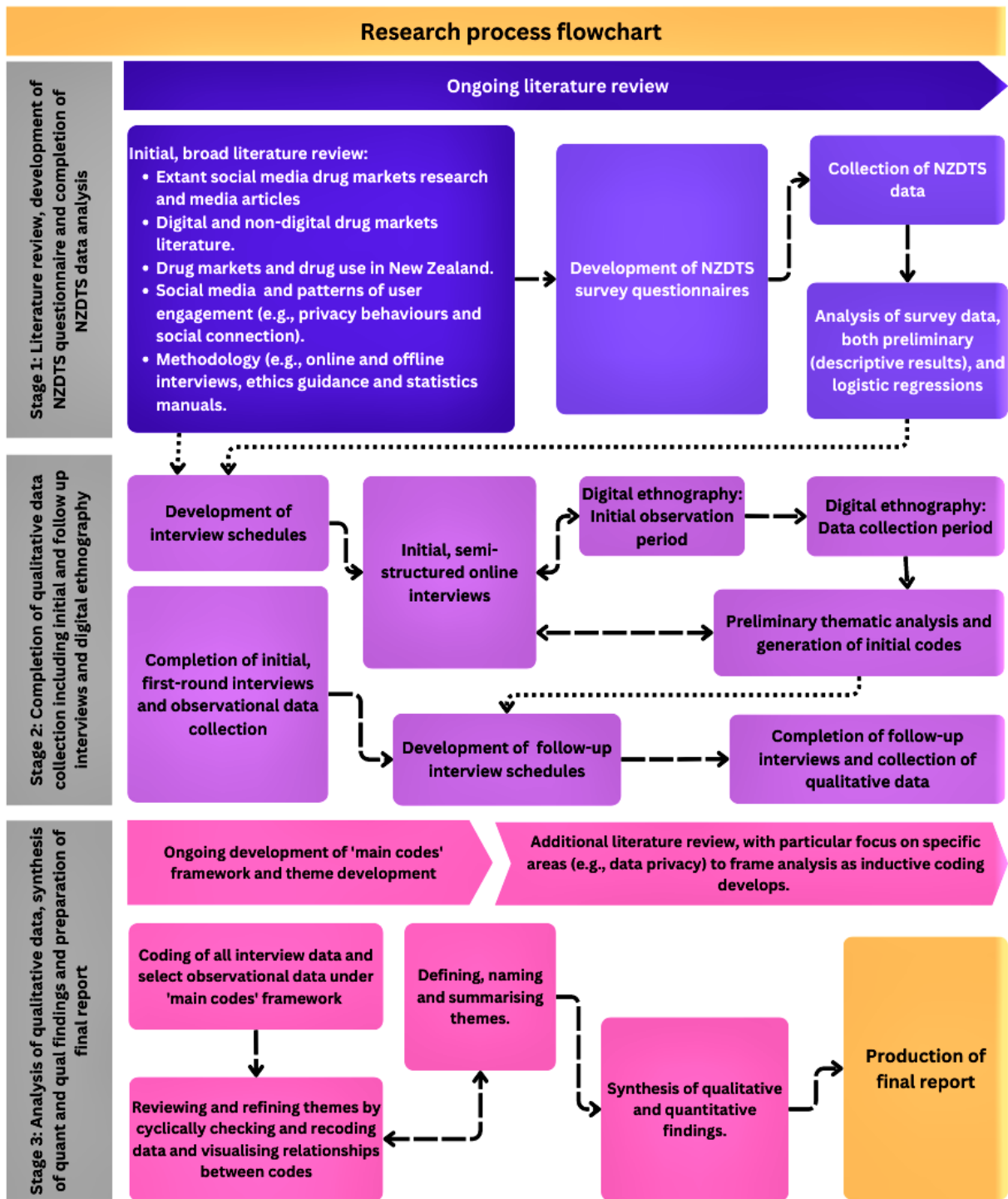


Figure 7: A flowchart illustrating the development of the mixed methods approach taken in this study.

Chapter 5: Predictors of using social media to purchase drugs in New Zealand: Findings from a large-scale online survey

Chapter 5 draws on statistical analysis of NZDTS data to explore the relationship between different demographic and drug market predictor variables and social media purchasing of cannabis, MDMA (ecstasy), LSD and methamphetamine in New Zealand. In doing so, this chapter considers how New Zealand's unique local drug market, characterised by its small size and geographic isolation, may influence social media drug purchasing across groups with different drug use patterns and socio-demographics. The findings are tied into a section on policy implications, including how social media drug trading translates into a need to integrate social media platforms into drug education and prevention programmes. This manuscript was published in the *International Journal of Drug Policy* in December 2021.

van der Sanden, R., Wilkins, C., Romeo, J. S., Rychert, M., & Barratt, M. J. (2021). Predictors of using social media to purchase drugs in New Zealand: Findings from a large-scale online survey.

International Journal of Drug Policy, 98, 103430.

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Abstract

Background: There are increasing reports of social media being used to buy and sell illegal drugs internationally. Studies of social media drug markets to date have largely involved general explorations of social media drug transactions in select countries. Social media drug markets may operate differently for different drug types and in different country contexts.

Aims: To identify predictors of the use of social media to purchase cannabis, methamphetamine, LSD and ecstasy/MDMA in New Zealand using a large-scale online survey sample.

Methods: The annual New Zealand Drug Trends Survey (NZDTS), an online convenience survey promoted via targeted Facebook™ campaign, was completed by 23,500 respondents aged 16+. Logistic regression models were fitted to identify demographic, drug use and drug market predictors of reporting the use of social media to purchase cannabis, methamphetamine, LSD and ecstasy/MDMA.

Results: Fifty-one percent of the sample had purchased cannabis, methamphetamine, ecstasy/MDMA or LSD in the past six months, of which 22% had done so via social media (n = 2,650). Cannabis was the drug type most purchased from social media among drug purchasers (24%), followed by ecstasy/MDMA (13%). Sixty percent of social media purchasers had used Facebook™, 48% Snapchat™, and 20% Instagram™. The leading advantages of social media purchasing were “high convenience” (74%), and “fast transaction speed” (43%). Younger age was a significant predictor of social media purchasing for all drug types (particularly among 16-17 year olds). Purchasing from someone identified as a “drug dealer” was a predictor of social media purchasing among respondents for all drug types.

Conclusion: Social media drug markets may have significant implications for drug purchasing by youth through providing greater access to supply and breaking down age-related barriers between social supply and commercial drug markets. Our findings highlight the importance of incorporating social media platforms into youth drug prevention and harm minimisation strategies.

Introduction

Social media are a diverse range of online websites and mobile apps facilitating diverse forms of social connection via the production of user-generated content (Kaplan & Haenlein, 2010). These platforms are increasingly recognised as facilitating retail-level illegal drug transactions, but academic scholarship investigating this phenomenon remains in the early stages. To date, studies of the online drug trade have largely focused on darkweb cryptomarkets (Barratt & Aldridge, 2016), surface web online pharmacies (Orizio et al., 2011), or the online trade in new psychoactive substances (NPS) (Hillebrand et al., 2010). In general, researchers have placed social media platforms as serving a connective function between buyer and seller, where the transaction is organised via the chosen platform, but completed via in-person pick up or delivery (e.g., Moyle et al., 2019). This is a point of difference from cryptomarkets, and online pharmacies which rely on postal services and can more readily service international markets (e.g., Aldridge & Décarý-Hétu, 2014). However, research on social media drug markets to date has been limited to a handful of exploratory studies of general social media drug market transactions and attributes in select countries (Demant & Bakken, 2019; Demant et al., 2020; Demant et al., 2019; Moyle et al., 2019).

Moyle et al. (2019) have published the first exploratory study of social media drug purchasing involving respondents from Australia, the U. S., Canada, and the U. K. The authors investigate differences between cryptomarket drug purchasing and use of social media, reporting that social media purchasers value convenience and easy to use security measures, such as encryption functions or data ephemerality. Participants in their online survey had predominantly used social media to access cannabis (64.5%), LSD (7.9%) and ecstasy/MDMA (6.5%) (Moyle et al., 2019). Researchers in Scandinavia have investigated social media drug markets in Sweden, Denmark, Norway, Finland and Iceland using interviews and online ethnography. Their findings highlight considerable variation in app use, size, shape and selling dynamics across social media drug markets by country (Demant et al., 2019). Demant and Bakken (2019) suggest that social media drug markets may have an impact on drug use and drug-trying behaviours among young people, facilitating their access to commercial drug markets as opposed to social supply options within their networks. Demant et al. (2020) also propose that social media drug markets operate as fluid junctions between different (online) drug market environments and seller types within the context of the social media trading of pharmaceuticals.

Currently, only two studies have incorporated quantitative survey methods in analysis of social media drug purchasing. Firstly, Moyle et al.'s (2019) mixed methods study employed a

survey (N = 358) of an international group of social media purchasers from Australia (n = 74), the U.S. (n = 152), Canada (n = 21) and the U.K., (n = 17) recruited via *reddit*. Oksanen et al. (2021) conducted a large survey of young people aged 15-25 in the United States (n = 1,212) and Spain (n = 1,212) aimed at evaluating psychological, behavioural and social risk factors that may influence more general online drug purchasing behaviours. Social media purchasing was found to be the most common way young people purchase drugs online with 77% of online drug purchasers having used social media. Furthermore, online purchasing of substances was associated with several risk factors in developing drug dependency among young people, such as low self-control or problems with mental wellbeing (See also, Oksanen et al., 2020).

To date there has been limited quantitative analysis of the relationship between demographic and drug market variables such as age, occupation, drug type, and seller types within the context of social media drug purchasing. This is coupled with a growing acknowledgement of online drug trading as geographically patterned and influenced by offline drug market trends and structures, as has been highlighted in a growing body of literature on cryptomarkets (Broséus, Rhumorbarbe, et al., 2017; Demant, Munksgaard, Décary-Héту, et al., 2018; Norbutas, 2018). In relation to social media drug purchasing, indications of the diversity of market structures and patterns of app use have been highlighted by researchers (Demant et al., 2019). Furthermore, Moyle et al. (2019) found differences in app preferences across different groups of survey respondents, with Australian buyers more likely to use Wickr™, and those from the UK more likely to use WhatsApp™. These findings highlight the need to build a broader understanding of how social media drug markets may be positioned within and patterned by geographically and demographically distinct drug markets. We therefore suggest that considering these factors in a New Zealand context characterised by geographic isolation and a small population can contribute to our understanding of these relationships.

The New Zealand drug market

The New Zealand illegal drugs market has a number of unusual characteristics, including low population density outside of major cities, as well as geographic isolation and distance from major drug production and supply routes (Wilkins, Romeo, et al., 2018). Domestically produced drugs, such as cannabis and methamphetamine, have been found to have higher levels of availability than drug types manufactured overseas that must be smuggled into New Zealand, such as MDMA (Wilkins, Romeo, et al., 2018). As a result, ecstasy/MDMA has often been expensive and of poor quality, while drug types such as methamphetamine tend to be widely available, even in rural

areas (Wilkins et al., 2020). Since the late 1990's, New Zealand ethnic and motorcycle gangs are believed to have played an active role in the importation, manufacture and sale of illegal drugs (Gilbert, 2013). Initially this took place through the cultivation and sale of cannabis via 'tinny houses' (street drug markets based out of private residences) (Gilbert, 2013; Wilkins et al., 2005), but in recent years also through the import, manufacture and sale of methamphetamine, particularly in rural regions (Savage, 2020; Wilkins, Romeo, et al., 2018).

Cannabis is the most widely used illegal drug in New Zealand with past-year prevalence of cannabis use in the general population estimated to be 15% in 2019 by the representative New Zealand Health Survey (NZHS). Stimulants such as ecstasy/MDMA and methamphetamine represent more recent additions to New Zealand's drug market, emerging only in the late 1990's and early 2000's, with stimulants gradually eclipsing LSD as New Zealand's second most used group of illicit drugs during this period (Wilkins et al., 2002; Wilkins et al., 2003).

Currently there is a dearth of research considering online drug purchasing in New Zealand, with no studies currently published on social media drug markets. However, there are anecdotal reports that online purchasing – via cryptomarkets, social media or otherwise – is increasing (e.g., Dillane, 2019; Marshall, 2021; Morrah, 2018). Results from the Illicit Drug Monitoring System (IDMS) – a face-to-face interview-based survey with people in the main cities who frequently use drugs – has shown steady increases in the number of respondents indicating purchasing substances via the "internet" (Wilkins et al., 2017). Online purchasing (in the past 6 months) reportedly increased for methamphetamine (up from 3% in 2014 to 10% in 2016), cannabis (up from 2% in 2014 to 10% by 2016) and ecstasy (up from 10% in 2014 to 15% in 2016) (Wilkins et al., 2017).

This paper is part of a larger mixed methods project examining the impact of social media drug markets in New Zealand, in which we report the findings from a quantitative survey designed to provide the foundation for future qualitative investigation of social media drug markets in New Zealand. The aim of the quantitative survey was to explore demographic, drug use and drug market predictors of purchasing different drug types from social media using a large survey sample of New Zealanders. The use of different drug types is associated with specific consumption and purchasing patterns, as well as specific socio-demographic characteristics of different groups of people who use drugs, and this is particularly likely to be the case in New Zealand's unusual drug market.

Method

The New Zealand Drug Trends survey (NZDTS) is an anonymous online convenience survey designed to provide an annual snapshot of drug use and drug market trends in New Zealand using Qualtrics software (Wilkins, Romeo, et al., 2018; Wilkins et al., 2020). The 2020 NZDTS survey was promoted solely via a targeted Facebook™ (e.g., Ramo & Prochaska, 2012; Thornton et al., 2016) advertising campaign from 24 January 2020 until 19 May 2020. The promotional campaign was targeted at Facebook™ users aged 16 or older and living in New Zealand who had expressed interest in a range of entertainment options and activities associated with drug use, such as alcoholic beverages, music genres and the night time economy (Van Havere et al., 2011). No incentive payment was offered to participate.

A total of 26,121 people clicked on the link and began the survey. IP addresses were not stored; rather a custom software solution was designed to convert respondent IP addresses into non-reversible numbers. Survey responses with the same numbers were flagged as potential duplicates and then checked for demographic similarities and extent of completion to determine if they had been submitted by the same person. In cases where the demographics matched, the most complete survey response was kept. If the demographics differed, both responses were kept. Surveys with less than 15% completion (i.e., only demographic questions answered), or responses in which age was unspecified or did not fall within the age range 16-90 were also removed. In total 2,621 responses were removed: 110 of these were duplicates, 826 were insufficiently complete, and 1,685 were removed for either not specifying an age or entering an age of under 16 or over 90. This left a total sample size of 23,500.

The median time to complete the survey was 17 minutes. The research was approved by the Massey University Human Ethics Committee (Application code: SOA 17/43).

Measures

Demographics

Participants were asked their age (open text field), gender (“male”, “female”, “gender diverse”), ethnicity (“Māori”, “NZ European/Pākehā”, “Pacific Islander”, “Asian”, “Indian”, “other” (including open text field)), level of education (“none”, “primary/intermediate”, “high school”, “polytech/trade”, “university”) and their employment status (“employed”, “student”, “unemployed”, “retired/parenting”, “sickness”). Participants were also asked what region of New Zealand they resided in and whether they lived in a “city”, “small town” or “rural area”.

Drug use patterns

Participants were asked to select all the drug types they had used in the previous six months (including alcohol and tobacco), and asked to indicate how frequently they had used a selected drug type in the past six months (i.e., “daily or near daily”, “once or twice a week”, “monthly”, “once or twice in the last 6 months”).

Drug market indicators

For each drug type reported used in the past six months, participants were asked about the perceived current availability (i.e., “very easy”, “easy”, “difficult”, “very difficult” to get), price change (i.e., “increasing”, “fluctuating”, “stable”, “decreasing”), and current strength (i.e., “low”, “fluctuating”, “medium” and “high”). Respondents were also asked to indicate all the locations where they had purchased each drug type in the past six months and could select all that applied (i.e., “street drug market”, “agreed public location”, “darknet”, “social media”, “other website”, “a pub/bar/club”, “work or educational institute”, “private house”, “dial up/text/home delivery”). Respondents were then asked to indicate all the seller types they had purchased a drug type from in the past six months (i.e., “gang member/seller”, “drug dealer”, “social acquaintance”, “friend/partner/family member”). Gang members in New Zealand are identifiable by distinctive gang regalia including back patches, colours, symbols and tattoos, with many mimicking the motorcycle gang subcultures first established in the United States (Gilbert, 2013; Savage, 2020). The term “drug dealer” is used in the survey to distinguish people who sell drugs from those who the respondent has some personal relationship (i.e., “friend/partner/family” or “social acquaintance”). Respondents were only asked about purchasing location and seller type for the drug types they had indicated using in the past six months.

Social media measures

All participants who indicated having purchased a drug from social media in the past six months were asked to indicate what app(s) they had used to purchase drugs (i.e., “Facebook”, “Snapchat”, “instagram”, “WhatsApp”, “Wickr”, “Kik”, “Telegram”, “Dating apps (Tinder/Grindr)”, “Discord”, “other” – an open-ended field). They were also asked to indicate the advantages of purchasing drugs from social media from a fixed list (i.e., “more convenient”, “easier to use than the darknet”, “wider range of drug types available”, “faster delivery/transaction”, “drugs are cheaper”, “drugs are higher potency/quality”, “is more anonymous (protects identity)”, “avoids risk of drug dealer violence”, “no need to travel to bad neighbourhoods”, “buyers can see the ratings of sellers/products”, “other” (including open text field)). Multiple options could be chosen.

Analysis

Variables that predicted social media drug purchasing (Y/N) were explored using logistic regression, including drug use patterns, drug market variables and controlling for demographics factors as described above. Four separate logistic regression models were developed for predicting social media purchasing of cannabis, methamphetamine, ecstasy and LSD, respectively. Models were separated by drug type to better account for different consumption and purchasing patterns, as well as socio-demographic characteristics of different groups of people who use drugs. Furthermore, differing sample sizes for each drug type meant that fitting separate regressions would avoid the need to assess interaction terms between drug types and predictor variables, facilitating more streamlined interpretation of results.

The frequency of drug use was coded slightly differently for different drug types as some drug types were used less frequently than others; for example, daily use of LSD and ecstasy/MDMA was very rare. In all comparisons, the category “once or twice in the past six months” was used as the reference category as this category represented the lowest frequency of drug consumption. For methamphetamine and cannabis, “daily or near daily”, “once or twice a week”, and “monthly” use were compared to the reference category. For ecstasy/MDMA, three frequency categories were compared (i.e., “once or twice a week or more often” and “monthly” versus “once or twice in the past six months”), and in the case of LSD two categories were compared (“monthly or more often” versus “once or twice in the past six months”).

To address the fact that purchasers of one drug type may also have used other drug types in the past six months (e.g., cannabis purchasers may also have used methamphetamine), for each regression model, the remaining frequencies of drug use indicated by purchasers of that drug type were assessed as predictors. These frequencies were included in the model as continuous variables, i.e., assuming the values 0 to 4 for none (0), once or twice (1), monthly (2), weekly (3), and daily (4), respectively. This was done to explore drug use among social media purchasers in a broader way and to consider possible relationships between the use and purchasing of multiple drug types within the previous six months. Due to the unbalanced spread of the frequency of use data, a continuous variable was found to enable the most consistent fit across the models.

The drug market variables “current availability”, “price change” and “current strength” were included in the model as dichotomous variables (“very difficult/difficult” vs “easy/very easy”, “increasing” vs “decreasing/stable/fluctuating”, and “low” vs “fluctuating/medium/high, respectively”). Types of sellers were also included as independent dichotomous variables (i.e., buyers who had purchased from a “gang member/seller” vs buyers who had *not* purchased from

a “gang member/associate”). Additionally, the variable “COVID-19 period” was considered (i.e., “during 1st lockdown” and “pre-lockdown”), however this variable, along with “price change” and “current strength”, was not significant across the models.

The demographic variables including age were categorised using dummy variables for the groups 16–17, 18–20, 21–23, 24–25, 26–35 and 36+ (reference). Age was categorised, rather than included as a continuous variable to avoid the inclusion of polynomial terms or smoothing functions (e.g., splines), in order to better facilitate the interpretation of results across drug types purchased. Gender was categorised as 1= “male”, 0= “female”, while “gender diverse” was removed due to small respondent numbers. Ethnicity was categorised using dummy variables for the groups “Māori”, “NZ European” (reference) and “other ethnicity”. Highest level of education was grouped by tertiary education (high) versus other levels of education such as high school (low). The dummy variable was then fitted as 0= “trade/technical” or “university”, 1= “none”, “primary/intermediate”, “high school”. Employment status was fitted as dummy variables for the groups (“student”, “employed” (reference), and “unemployed/others”). The “geographical” variables included were New Zealand regions and town type (0=“rural area” or “small town”, 1=“city”).

Covariates were kept in the logistic regression models if they were statistically significant ($p < 0.05$). The goodness of fit for all the logistic regression models was assessed using the Hosmer and Lemeshow test (Hosmer & Lemeshow, 2000). All analysis was undertaken using SAS software (version 9.4).

Results

Demographics

Sixty-one percent of the survey sample (N = 23,500) were male, 38% were female and 1% gender diverse. The median age of the sample was 23 years (mean: 28.5, IQR = 14). Respondents of New Zealand European ethnicity accounted for 74% of the sample, while 16% of respondents were Māori (the indigenous people of Aotearoa/New Zealand), 3% Asian and 2% Pacific Islanders. Thirty-eight percent of respondents had completed secondary school, 26% a trade or technical qualification, and 33% had a university degree. Sixty-two percent of respondents reported they were working full- or part-time, 26% were students and 11% were unemployed, retired, in unpaid work or on a sickness benefit. The drug types reported most widely used in the last six months by the total survey sample were alcohol (91%), cannabis (75%), tobacco (61%), ecstasy/MDMA (51%)

and LSD/psychedelics (31%). Seventy-four percent of the sample (n = 17,453) had used cannabis, methamphetamine, ecstasy/MDMA or LSD in the past six months, and 51% had purchased those drugs in the past six months.

Extent of purchasing from social media

Twenty-two percent of the respondents who had purchased cannabis, methamphetamine, ecstasy/MDMA or LSD in the past six months (n = 11,953) had done so from social media (n = 2,650). Social media purchasing of drugs was highest among cannabis purchasers (at 24% of those who had purchased cannabis during the last six months), followed by ecstasy/MDMA (13%) methamphetamine (9%) and LSD purchasers (9%). Facebook™ was the app most commonly used by social media purchasers of drugs (60%), followed by Snapchat™ (48%) and Instagram™ (20%) (Table 6).

Advantages of purchasing from social media

The most commonly reported advantages of accessing drugs using social media were “high convenience” (74%), “speed of transactions” (43%) and “ease of use in comparison to the darknet” (41%) (Table 7). “Drug quality/potency” (10%), “lower price” (13%) and “ability to see reviews of sellers and products” (13%) were only reported by a minority (Table 7).

Table 5: Apps reported used by those who had purchased a drug from social media in the last six months.

Apps	% (n = 2707)
Facebook	60
Snapchat	48
Instagram	20
Wickr	9
Discord	9
WhatsApp	6
Dating apps (Tinder/Grindr)	4
Other ¹⁰	4
Kik	2
Telegram	2

Table 6: Nominated advantages of using social media to purchase drugs¹¹

Advantages	% (n = 2,707)
More convenient	74
Faster delivery/transaction	43
Easier to use than the darknet	41
You don't have to travel to bad neighbourhoods	28
Is more anonymous (protects your identity)	24
Avoids the risk of drug dealer violence	23
Wider range of drug types available	18
Buyers can see the ratings of sellers/products	13
Drugs are cheaper	13
Other	6
Avoids physical contact/travel (COVID-19)	4

¹⁰ Open text field responses under "other" included "Signal", "Reddit", "texting", "not telling" and "through friends" (paraphrased).

¹¹ Multiple responses were possible. The advantage "avoids physical contact/travel (COVID-19)" was added to the survey in March 2020.

Social media and non-social media purchaser comparison

Table 7 provides an initial comparison of the demographic, geographic and drug market indicators of social media purchasers versus non-social media purchasers for cannabis, methamphetamine, LSD and ecstasy/MDMA. Higher proportions of students and Māori purchased drugs from social media than from other means of supply. Those who purchased from social media were also more likely to report the current availability of a drug as “very easy”. Table 7 also indicates higher proportions of social media drug purchases were made from “gang members/associates” and “drug dealers”.

Results of logistic regression models

Table 8 presents the results of the logistic regression models to identify independent predictors of having used social media to purchase cannabis, methamphetamine, LSD and ecstasy/MDMA in the last six months. Younger age was a strong predictor of using social media to purchase all four drug types via social media. For example, purchasers aged 16-17 were significantly more likely than those aged 36 years or older to have purchased cannabis (OR = 8.11), ecstasy/MDMA (OR = 10.21) and LSD (OR = 8.12) via social media. For methamphetamine, purchasers aged 21-23 had the highest probability of having purchased from social media compared to those aged 36 years or older (OR = 6.13). Similarly, for all drug types excluding methamphetamine, social media purchasers were more likely to indicate a drug type was “very easy” or “easy” to obtain (Cannabis OR = 1.28, ecstasy/MDMA OR = 1.26, LSD OR = 1.28).

Purchasing from a person selling drugs who the respondent identified as a “drug dealer” (as opposed to a “friend/family member/partner” or “social acquaintance”) was a strong predictor of having used social media to purchase all four drug types. For cannabis, social media purchasers were three times more likely than non-social media purchasers to have bought cannabis from a “drug dealer” in the last six months. A similar association was found for methamphetamine (OR = 4.99), ecstasy/MDMA (OR = 3.07) and LSD (OR = 2.28). Purchasing from a “gang member/associate” was also predictive of social media purchasing for cannabis (OR = 2.35), methamphetamine (OR = 2.48), ecstasy/MDMA (OR = 2.32) and LSD (OR = 2.24).

Social media cannabis purchasers were more likely to be unemployed (OR = 1.29) and of Māori ethnicity (OR = 1.17). Furthermore, living in a city predicted social media purchasing for cannabis (OR = 1.23), as well as residing in the Waikato (1.60), Wellington (1.28), Canterbury (1.35)

and Otago (1.46) regions compared to Auckland (the city with the highest population in New Zealand). Daily cannabis use was associated with an increased likelihood of buying from social media (OR = 1.35).

Social media methamphetamine purchasers were more likely to have a low education level (OR = 1.93), be students (OR = 3.24) and be unemployed (OR = 1.98). Social media ecstasy/MDMA purchasers were more likely to reside in an urban area (OR = 1.28) and had a higher likelihood of residing in the Bay of Plenty/Gisborne/Hawke's Bay regions (1.34).

Table 7: Demographic comparison between social media purchasers and non-social media purchasers by drug type (Commences on the following page).

Demographic variable	Cannabis			Methamphetamine			LSD			Ecstasy/MDMA		
	Social media purchases [n = 1,993]	Non-social media purchases [n = 6,279]	All cannabis purchases [n = 8,272]	Social media purchases [n = 79]	Non-social media purchases [n = 833]	All meth purchases [n = 912]	Social media purchases [n = 317]	Non-social media purchases [n = 3,165]	All LSD purchasers [n = 3,482]	Social media purchases [n = 899]	Non-social media purchases [n = 5,832]	All ecstasy/MDMA purchases [n = 6,731]
Gender (%)												
Male	71	67	68	53	61	60	73	71	71	61	64	64
Female	27	32	31	44	38	38	25	28	27	37	35	35
Gender diverse	2	1	1	3	1	1	2	1	2	2	1	1
Age categories (%)												
16-17	9	3	4	3	2	2	9	4	5	9	4	4
18-20	40	20	25	14	6	6	46	30	30	47	30	32
21-23	24	17	19	23	7	9	26	23	23	27	24	24
24-25	8	8	8	13	7	8	8	11	10	8	10	10
26-35	12	24	21	28	31	30	9	21	20	8	21	20
36+	7	28	23	20	44	45	2	12	11	2	11	10
Age (years)												
Median age	21	26	24	25	35	34	20	23	22	20	23	22

Mean age	23	31	29	28	35	35	21	25	25	21	25	25
Ethnicity (%)												
Māori	20	16	17	32	24	24	18	14	14	16	13	13
NZ/European	70	75	74	62	70	69	74	76	76	76	78	78
Other	10	9	9	6	6	6	8	10	10	8	8	9
Occupation (%)												
Employed	56	68	65	47	69	67	58	68	67	57	66	65
Student	32	21	23	14	4	5	34	25	26	38	28	30
Unemployed/ other	12	12	12	39	27	28	8	7	7	5	6	6
Education (%)												
High (tertiary)	52	65	62	42	58	57	49	64	62	55	64	63
Low (Secondary of lower)	48	35	38	58	42	43	51	36	38	45	36	37
Location (%)												
City	71	66	68	57	59	59	70	71	71	76	72	72
Rural/small town	29	34	32	43	41	41	30	29	29	24	28	28
Island (%)												
North	70	72	71	67	76	75	69	67	67	71	70	70
South	30	28	29	33	24	25	31	33	33	29	30	30
Region (%)												

Auckland	24	29	28	14	27	3	28	28	30	28	30	30
Bay of Plenty and Gisborne/ Hawke's Bay	10	10	10	18	13	14	8	7	7	10	8	9
Canterbury	16	14	15	24	12	13	19	16	16	17	16	16
Northland	3	4	3	1	5	5	3	3	3	2	3	2
Otago	9	7	8	3	3	3	9	9	9	8	9	9
Southland/West Coast and Tasman/Nelson/ Marlborough	5	7	6	6	9	9	5	7	7	4	5	5
Taranaki/Manaw atu-Wanganui	6	7	7	15	11	11	5	6	6	5	6	6
Waikato	10	8	8	6	11	10	6	6	6	9	7	7
Wellington	18	15	15	13	9	9	20	17	18	18	16	17
Availability (%)												
Very easy	34	18	22	58	42	44	17	10	11	35	23	25
Easy	46	47	47	32	39	38	40	38	38	48	49	49
Difficult	18	28	26	3	13	13	36	43	42	16	24	23
Very difficult	3	6	5	6	5	5	7	9	9	2	4	4
Strength (%)												

High	18	41	17	17	20	20	30	26	26	25	23	23
Low	4	4	4	7	11	10	2	3	3	4	5	5
Medium	33	38	37	24	28	28	36	38	38	35	36	36
Fluctuating	46	41	4	53	42	42	32	33	33	36	36	36
Price change (%)												
Decreasing	5	2	3	57	47	48	12	8	8	34	28	29
Increasing	13	15	15	3	5	5	4	5	5	5	6	5
Fluctuating	17	13	14	20	14	14	18	14	14	16	15	15
Stable	65	69	68	20	34	33	67	73	72	44	52	51
Frequency of use (%)												
Daily	60	49	52	29	20	21	1	0.3	0.3	1	0.3	0.5
Weekly	21	23	22	33	24	25	6	3	3	22	11	13
Monthly	12	16	15	20	18	18	26	21	21	43	38	38
Once or twice in last 6 months	7	12	11	18	38	36	67	76	75	34	51	49
Seller type (%)												
Gang member	38	11	18	70	29	33	6	2	2	16	4	6
Drug dealer	86	45	55	92	56	59	61	30	33	70	36	40
Social acquaintance	74	61	58	77	44	50	43	34	34	58	42	44

Friend/family member	77	61	65	58	40	41	46	49	48	64	54	56
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Table 8: Predictors of social media purchasing for cannabis, methamphetamine, ecstasy/MDMA and LSD.

	Cannabis (n = 8,215)		Methamphetamine (n = 907)		Ecstasy/MDMA (n = 6,671)		LSD (n = 3,443)	
Proportion of "SM purchasers"	0.24		0.09		0.13		0.09	
Effect	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Gender (Male vs Female)	n.s.		n.s.		n.s.		n.s.	
Education (secondary or lower vs tertiary)	n.s.		1.93*	1.13-3.29	n.s.		n.s.	
Occupation:								
Student vs Employed	0.98	0.84-1.14	3.24*	1.31-8.06	n.s.		n.s.	
Unemployed/others vs Employed	1.29*	1.06-1.56	1.98*	1.13-3.46	n.s.		n.s.	
Ethnicity:								
Maori vs NZ Euro	1.17*	1.01-1.37			n.s.		n.s.	
Other vs NZ Euro	1.22	1.00-1.49	n.s.		n.s.		n.s.	
Region:								
Northland	1.06	0.73-1.54	n.s.		1.04	0.61-1.76	n.s.	

Auckland	REF		REF		REF		REF	
Waikato	1.60***	1.27-2.02	n.s.		1.17	0.87-1.59	n.s.	
Bay of Plenty and Gisborne/Hawke's Bay	1.08	0.86-1.36	n.s.		1.34*	1.01-1.79	n.s.	
Taranaki/Manawatu-Wanganui	1.07	0.83-1.40	n.s.		1.01	0.70-1.46	n.s.	
Wellington	1.28**	1.06-1.53	n.s.		1.06	0.84-1.33	n.s.	
Southland/West Coast and Tasman/Nelson/Marlborough	1.07	0.81-1.42	n.s.		0.93	0.61-1.40	n.s.	
Canterbury	1.35**	1.12-1.62	n.s.		1.20	0.95-1.51	n.s.	
Otago	1.46**	1.16-1.85	n.s.		0.84	0.63-1.13	n.s.	
Island: North vs South	n.s.		n.s.		n.s.		n.s.	
City town: City vs Rural/small town	1.23**	1.08-1.41	n.s.		1.28**	1.06-1.53	n.s.	
Age: 16-17 vs 36+	8.11***	5.88-11.20	1.92	0.31-11.84	10.21***	5.63-18.50	8.12***	3.41-19.35
18-20 vs 36+	5.23***	4.17-6.56	4.72**	1.84-12.11	7.01***	4.12-11.93	7.06***	3.24-15.35
21-23 vs 36+	3.71***	2.95-4.65	6.13***	2.68-13.98	5.23***	3.05-8.97	5.40***	2.45-11.88
24-25 vs 36+	2.79***	2.12-3.67	3.43**	1.36-8.64	3.80***	2.13-6.76	3.58**	1.52-8.46
26-35 vs 36+	1.51**	1.20-1.91	1.48	0.73-2.99	2.03*	1.15-3.60	2.12	0.91-4.94

Frequency of use (continuous)¹²	n.s.	n.s.			n.s.		1.12*	1.01-1.24
Frequency of use:								
Daily vs 1-2 6months	1.35**	1.08-1.68						
Weekly vs 1-2 6months	1.12	0.89-1.43						
Monthly vs 1-2 6months	0.98	0.76-1.26						
Easy to get:								
Easy/Very easy vs Very difficult/Difficult	1.22**	1.02-1.34	n.s.		1.21*	1.07-1.38	1.22*	1.05-1.43
Price change:								
Increasing vs Fluctuating/Stable/Decreasing	n.s.		n.s.		n.s.		n.s.	
Strength:								
Low vs Fluctuating/Medium/High	n.s.		n.s.		n.s.		n.s.	
Seller type:								
Gang member/seller	2.35***	2.04-2.70	2.48**	1.40-4.43	2.32***	1.81-2.97	2.24**	1.25-3.99
Drug dealer	3.59***	3.07-4.18	4.99**	1.99-12.48	3.07***	2.61-3.62	2.88***	2.24-3.70
Social acquaintance	1.85***	1.62-2.11	3.41***	1.86-6.27	1.79***	1.54-2.09	1.96***	1.53-2.5
Friend/family	1.65***	1.44-1.88	n.s.		1.51***	1.29-1.77	n.s.	
Hosmer and Lemeshow								
Goodness-of-fit		0.756		0.186		0.109		0.205

¹² Notes on presented data: *<0.05, **<0.01, ***<0.001

Continuous frequency of use variable coded as 0 = none 1 = Once or twice in last 6 months, 2 = monthly, 3 = weekly, 4 = daily.

Discussion

This paper adds to the emerging understandings of how social media drug markets are located within larger geographically distinct drug market environments, in particular highlighting the potential for significant changes to how younger age groups interact with local drug markets.

We found age was the strongest predictor of having used social media to purchase cannabis, methamphetamine, ecstasy/MDMA and LSD in the past six months in New Zealand. Drug purchasers under the age of 20 were many times more likely than older drug purchasers to have purchased a given drug type from social media. This relationship was strongest for respondents aged 16-17 years old. These findings are consistent with previous research suggesting high use of social media to buy drugs among young people (Demant & Bakken, 2019; Moyle et al., 2019; Oksanen et al., 2020). This likely reflects a range of factors including high prevalence of drug trying behaviours among younger age groups (e.g., Van Havere et al., 2009), as well more intense engagement with social media platforms (GlobalWebIndex, 2019; Pew Research Center, 2018). A range of research has highlighted the increasing visibility and normalization of drug related material and content on social media more generally (Cook et al., 2013; George et al., 2019; Hanson et al., 2013; Petersen et al., 2021).

For methamphetamine, social media purchasers were most likely to be slightly older (i.e., aged 21-23) as opposed to under 20 years. Methamphetamine use is often associated with older age groups, who have more experience using a range of drug types. Findings from the IDMS indicate that frequent methamphetamine users tend to be older (mean age 36) compared to frequent ecstasy users (mean age 25) (Wilkins et al., 2017). The New Zealand Health Survey (NZHS) also consistently indicates that past-year prevalence of methamphetamine use is highest among those aged 25-34 (Ministry of Health, 2022). The higher rates of social media drug purchasing among youth overall raises important questions as to how social media drug markets will initiate young people into local drug markets amid quickly changing social media technology (boyd, 2014; Van Dijck, 2013).

Our findings also contribute to the emerging understanding of the characteristics of social media drug markets in different geographic locations (Demant et al., 2019). Facebook™ was most commonly used among social media drug purchasers surveyed in the NZDTS (60%), followed by Snapchat™ (48%) and Instagram™ (20%), compared to an inverse of this relationship in Moyle et al.'s (2019) seminal article (Snapchat™ = 76%, Instagram™ 48% and Facebook™ 22%). Our survey has also highlighted the emergence of the previously unmentioned social media platform

Discord™ (9%). Discord™ allows users to create private online communities called ‘servers’ to chat and video- or voice-call with friends. New Zealand media reports (Harris, 2021; McKenzie, 2020) have highlighted the use of Discord™ servers to facilitate pseudo-anonymous local drug selling groups, with servers accessed using an ‘invite-link’ and transactions typically completed using in-person pick up or delivery.

Māori ethnicity was predictive of purchasing cannabis from social media (OR = 1.17). Historically, Māori have reported higher rates of cannabis use in comparison to other ethnicities in New Zealand (Marie et al., 2008; Theodore et al., 2020; Wilkins et al., 2005). The 2018/19 NZHS found Māori are 2.09 times more likely than non-Māori to have used cannabis in the past year (Ministry of Health, 2022). However, at this stage it is unclear why Māori are more likely to purchase cannabis from a social media platform. Further research is needed to understand how engagement with social media for drug purchasing may vary across cultural groups.

Social media purchasing of drug types cannabis, ecstasy/MDMA and LSD was linked to an increased likelihood of perceiving these drugs as “easy to get” (OR = 1.22, 1.21, 1.22 respectively). These findings are consistent with reported advantages of social media purchasing, where high convenience and fast transaction speed have been cited by NZDTS respondents and in other studies (Bakken & Demant, 2019; Moyle et al., 2019). However, the causal direction of this relationship is unclear. Social media’s ability to facilitate connections between buyers and sellers as well as the open selling behaviours associated with some social media platforms (Bakken & Demant, 2019) likely increases buyer perceptions of drug availability. Conversely, general availability of a drug type within a certain setting or group may in turn influence the use of social media for drug purchasing.

Greater perceived drug availability may also reflect the density and networked nature of physical drug markets. Our results indicate that the likelihood of purchasing either cannabis or ecstasy/MDMA from social media was greater in city areas. These drug types were the most widely used illegal drugs among survey respondents (cannabis = 75%, ecstasy/MDMA = 51%), as well as the most often purchased via social media (cannabis = 24%, ecstasy/MDMA = 13%). The popularity of these drug types and the concentration of buyer demand in urban centres may create denser and more networked retail drug markets than are found in rural areas. This dynamic may lead to a higher number of sellers on social media simply by virtue of supply and demand. Furthermore, these areas are more likely to support larger, more visible and competitive forms of social media drug market (Bakken & Demant, 2019), such as Facebook™ groups and Discord™ servers – which media reports situate as particularly popular in New Zealand’s capital city of Wellington (Harris,

2021; McKenzie, 2020). A concentration of selling behaviours in more densely networked areas may also lower the perceived risk of apprehension among market participants by creating an enforcement swamping effect (Kleiman, 1993).

We found purchasing from someone considered to be a “drug dealer” was the strongest predictor of purchasing from social media among survey respondents (cannabis OR = 3.59, methamphetamine OR = 4.99, LSD OR = 2.88, ecstasy/MDMA OR = 3.07), followed by purchasing from someone considered to be a “gang member/gang associate” (Cannabis OR = 2.35, Methamphetamine OR = 2.48, LSD OR = 2.32, ecstasy/MDMA OR = 2.24). In New Zealand, gangs are known to play a role in the black market cultivation and sale of cannabis and methamphetamine, particularly in rural regions of the country (Wilkins, Romeo, et al., 2018). Purchasing from “family/friends” (i.e., social supply-type sellers) was only a statistically significant predictor of social media purchasing for cannabis (OR = 1.65) and ecstasy/MDMA (OR = 1.51). Purchasing these drug types, particularly among young people, has traditionally been strongly linked to social supply and a separation from the commercial drug market (Coomber & Moyle, 2014; Coomber & Turnbull, 2007). Moyle et al. (2019) have suggested young people continue to prefer social supply as a means of brokering drug access in comparison to contacting professional sellers on social media. Conversely, Demant and Bakken believe social media may be accelerating young people’s movement into commercial drug market settings (2019). Our findings support this understanding, although in-depth qualitative research is needed to understand the impact social media drug markets are having on young people’s use and perceptions of social supply.

Policy Implications

Our findings have important implications for youth drug education and prevention strategies. The uptake of mobile-technology and m-health apps in drug treatment and harm reduction campaigns has increased in recent years (EMCDDA, 2018a; Kazemi et al., 2017). Locally, the New Zealand Drug Foundation has launched online tools such as Drughelp (NZ Drug Foundation, 2021), and collaborates with the festival drug checking service ‘Know Your Stuff’ (KnowYourStuffNZ, 2022) to provide accessible sources of harm reduction information to young people who use drugs via Facebook, Instagram and Twitter. However, given diversity in patterns of social media purchasing and platforms used, disseminating messages geared towards safety online and ensuring they reach the right groups presents a considerable challenge.

Our findings indicate that school students aged 16+ are most likely to purchase a variety of drug types via social media. As such, school-based drug education programmes can provide

useful channels through which to embed these messages in social media settings among youth and may be particularly effective if they make use of social media channels such as Snapchat, of Instagram, that are most used among this group (Pew Research Center, 2018). In the United States, researchers recently evaluated the efficacy of the 'Living The Example' (LTE) school-based prevention programme, which trains "youth ambassadors" to disseminate peer-to-peer messaging and user-generated content on social media platforms to influence adolescent perceptions and intentions regarding illicit drug use (Evans, Andrade, et al., 2017; Evans et al., 2020). Preliminary results have indicated this programme to be an effective means of influencing and reducing drug using intentions among youth, however further large-scale evaluation is yet to be completed. The use of peer-to-peer messaging in these settings may provide a valuable tool that can broaden both the reach and legitimacy of targeted social media harm minimization messaging, allowing information to flow through otherwise difficult to access social media channels such as Snapchat and WhatsApp. We suggest future research may also look to consider how these messages may be successfully disseminated within private social media channels more broadly as well as within invite-only social media drug selling groups.

Limitations

Firstly, we note that quantitative studies of drug markets have a limited capacity to adequately portray the meanings, and cultural nuances associated with drug use and drug purchasing behaviour across different markets, groups and geographic locations (e.g., Dwyer & Moore, 2010).

The NZDTS has a number of limitations that should be taken into consideration when interpreting our findings. Firstly, the NZDTS is a convenience survey where participants self-select to take part and is therefore not representative of the drug-user population or wider New Zealand society. NZDTS respondents tend to report higher levels of drug use compared to the general population. For example, 75% of the 2020 NZDTS sample indicated past-six-month use of cannabis, compared to the population prevalence estimate from the NZHS of 15% for past-year cannabis use (Ministry of Health, 2022). Online surveys may encourage greater sharing of sensitive information, including higher levels of drug use, than face-to-face surveys at the respondent's physical residence, as in the NZHS (Miller & S nderlund, 2010). It is also important to note that the sample of methamphetamine purchasers (n = 907) who had purchased from social media (n = 79) is relatively small and this should be taken into account when interpreting the findings for methamphetamine.

The survey's promotion via Facebook™, including the additional targeting of promotion based on particular music and entertainment interests, is likely to impact the characteristics of the sample. For example, Facebook™ was reported to be the platform most often used to purchase illicit drugs via social media and this finding may have been influenced by our use of Facebook to promote the survey.

The NZDTS sample does broadly approximate the demographic profile of the wider New Zealand population. For example, the proportion of Māori in the NZDTS sample (16%) closely matches the New Zealand census (16.5%), as does the proportion of European respondents (74%) compared to the census figure (70%). The proportion of NZDTS respondents indicating they were unemployed (5%) is also similar to the national population figure (4%) (Stats NZ, 2020b). However, the NZDTS sample is younger (median age of 23 years) than the national population (median age 37) (Stats NZ, 2020c).

Online surveys exclude potential participants who do not have internet access (Miller & Sønderlund, 2010). However, rates of digital engagement in New Zealand are high by international standards, with 2018 census data indicating 86% of New Zealand's population have internet access (Stats NZ, 2020a), and 84% of those aged between 16 and 64 make use of Facebook at least monthly (Social & Hootsuite, 2020a).

Finally, NZDTS respondents could indicate multiple options for type of seller and type of selling location and this reduces the precision of the associations found between social media purchasing and other variables. This was done to reduce respondent burden (i.e., respondents having to answer the same questions on purchasing for each seller type).

Conclusion

This paper provides the first large scale quantitative exploration of social media drug markets in New Zealand and adds to a small but growing international literature. Our findings confirm that social media drug purchasing is concentrated among youth and associated with higher perceptions of drug availability and increased likelihood of purchasing from a "drug dealer". The findings highlight the potential for social media to have a considerable future impact on illegal drug markets, particularly as younger age cohorts initiate drug use and participate in drug buying, utilising new apps and bring new trends in social media engagement with them. The apparent dominant role of commercial drug sellers in these settings highlights a potential shift in their accessibility to younger age groups precipitating a movement away from social supply options.

Further research is needed to confirm these trends in other countries. Our findings also highlight the importance of broadening the incorporation of mainstream social media platforms into youth drug education and prevention strategies.

Chapter 6: The use of Discord Servers to buy and sell drugs

The previous chapter presented findings indicating a link between social media drug purchasing and perceptions of certain drug types as easily accessible, as well as purchasing from a commercial seller. Chapter 6 presents an in-depth qualitative exploration of a New Zealand social media drug market environment that expands on these initial findings in the context of one platform: Discord. At the time of data collection for this project Discord drug servers represented a notable, up-and-coming local social media drug market trend in New Zealand. Due to changes made to the Discord platform, it is likely that their use has decreased since this initial period, though undoubtedly drug servers of a smaller, more discreet nature continue to exist. This paper uses both interview findings and observational data coupled with drug market typology theory (Section 3.1.2) to explore Discord drug servers as they existed during the data collection period, discussing the nuances and challenges that arose as part of the process of 'learning' how to adapt Discord platform infrastructure to drug trading. This paper was published in *Contemporary Drug Problems* in December 2022 (an OnlineFirst edition was published in April 2022).

van der Sanden, R., Wilkins, C., Rychert, M., & Barratt, M. J. (2022). The Use of Discord Servers to Buy and Sell Drugs. *Contemporary Drug Problems*, 49(4).
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Abstract

The focus of current research on social media drug markets is the use of mainstream platforms such as Facebook, Snapchat and Instagram. No research currently exists examining how lesser-known social media platforms may facilitate online drug supply. This paper presents the first analysis of the use of the social media platform Discord to buy and sell illegal drugs. The study utilizes observational data and qualitative interviews with Discord drug market participants in New Zealand, including sellers and a drug server administrator (n=12). Our findings demonstrate that the Discord platform, which was initially established for gaming, is also being used to facilitate drug transactions. Discord is used to establish local drug selling groups called 'servers', which can be joined by accessing an 'invite-link'. The advantages of Discord drug servers cited by interviewees included competitive prices and the ability to greatly expand local seller and customer bases beyond pre-existing personal networks. However, accessibility, server size and management varied considerably between drug servers, giving rise to a range of issues and concerns. We use drug market typologies based on theory of 'open' and 'closed' markets to understand how 'lower tier' and 'higher tier' Discord drug servers provided different buying and selling environments. 'Lower tier' drug servers were generally characterized by greater ease of entry, larger size, higher rates of opportunism among participants and variable server management. Conversely, 'higher tier' drug servers typically involved tighter market entry controls, more active server management and were generally smaller in size. The emergence of Discord drug servers illustrates how the evolution of social media platforms presents their users with new spaces that can be adapted to function as drug markets and the tensions that may emerge during the process of 'learning' to buy and sell in a new social media space.

Introduction

Contemporary social media refers to a diverse range of internet-based platforms that facilitate connection, communication and cooperation between people and groups via the making of and engagement with accessible user-generated content (McCay-Peet & Quan-Haase, 2016). Examples of social media range from social networks such as Facebook (Ellison et al., 2007) and instant messaging tools such as Facebook's Messenger and WhatsApp (Swart et al., 2018), to photo- and video-creation and sharing platforms such as Instagram, Snapchat (Alhabash & Ma, 2017), and Tik Tok, or 'meta-communities' such as reddit (Moore & Chuang, 2017). The adoption of social media platforms to buy and sell illegal drugs is an emerging trend worldwide, enabled by the diversity and fluidity of the contemporary social media landscape (Demant et al., 2019; Moyle et al., 2019; Oksanen et al., 2021). The basic function of social media drug markets is similar across different platforms, which serve a connective function between buyer and seller, facilitating the organization of a trade. The actual exchange of goods and money occurs largely via in-person pick up or delivery (Demant et al., 2019; Moyle et al., 2019).

Studies to date have focused on the use of popular, mainstream social media platforms such as Facebook, Snapchat, Instagram, WhatsApp, and encrypted chat apps like Wickr and Telegram (Bakken, 2020; Blankers et al., 2021; Demant et al., 2020; Demant et al., 2019; Moyle et al., 2019). Understanding of how lesser-known social media platforms may facilitate the buying and selling of illegal drugs remains limited. Broadening our understanding of how different social media contexts can function as illegal drug markets is particularly important given that different platforms present their users with unique features and online risk and reward environments in which drug trading can take place. Given the proximity between social media drug markets and their local, offline counterparts, different platform environments and features may also influence how offline drug exchanges are carried out and to what extent buyers and sellers are at risk of negative outcomes such as robbery, rip off or arrest. In turn this may have considerable implications for harm reduction initiatives targeted towards individuals engaging with these settings and the kinds of policy settings governments adopt to manage digitally facilitated drug markets.

Consequently, this paper presents the first investigation of the use of the social media platform Discord to buy and sell drugs. We use drug market typologies based on theory of 'open' and 'closed' markets (May & Hough, 2004) to explore the ways in which Discord features are adapted to facilitate drug trading. We consider how variation in levels of drug market openness,

size, and security features impact buyer and seller experiences, such as the risk of robbery or exposure to police.

Social media drug markets: Existing research

At present there is a small literature on the use of social media to buy and sell illegal drugs (Bakken, 2020; Bakken & Demant, 2019; Barratt et al., 2021; Demant et al., 2020; Demant et al., 2019; Moyle et al., 2019; Oksanen et al., 2021). Existing studies highlight the convenience of buying and selling drugs via mainstream social media platforms, coupled with fast delivery services, low barriers to entry and ease-of-use, and inbuilt security features such as self-deleting messages (Demant & Bakken, 2019; Demant et al., 2019; Moyle et al., 2019). Bakken (2020) has examined how illegal drug sellers in Facebook drug selling groups ‘signal’ trust to prospective buyers. Oksanen et al. (2021) found that social media is the most commonly used means for young people to purchase drugs online in both the U.S. and Spain. Similar trends have been found in New Zealand where the use of social media for drug purchasing has also been linked to using commercial types of drug seller (van der Sanden et al., 2021). Two recent articles explore innovative digital drug market trends combining different platforms on the dark- and surface web. Childs, Bull, and Coomber’s (2022) study explored the use of the surface website *LeafedOut* as a means of connecting local illegal cannabis buyers and sellers in Melbourne, Sydney and Brisbane, with transactions often completed via encrypted apps. Additionally, Barratt et al. (2021) analysed the use of the darknet/encrypted app hybrid platform Televend, which lets vendors manage sales via the darknet using a ‘shopbot’, which interfaces with customers making purchases via the encrypted app Telegram.

The Discord platform

Launched in 2015, and originally developed as a voice-calling app for gamers, Discord allows users to create private or public online communities, or chat rooms – called ‘servers’¹³ – to message, video- or voice-call with anyone who has received an ‘invite-link’ to join (Discord, 2021a). Servers comprise a series of customizable ‘channels’ in which server members can chat or call others. Establishing a server is simple and streamlined, with server creators (hereafter termed administrators) able to customize server layout, channels, security, and member behaviour via a series of in-built server controls and permissions (Discord, 2021b, 2021c). Discord is

¹³ Note that the term ‘server’ in the Discord context is the name given to the Discord groups individuals can create and does not denote a separation of computer hardware or software.

pseudonymous, although it does require user accounts to be tied to a valid email address, and private messages between users are HTTPS encrypted rather than end-to-end encrypted, as on WhatsApp for example (Mozilla Foundation, 2020). The platform is available for desktop as well as smartphone.

In recent years there has been a largescale expansion of Discord's userbase, and the company has rebranded itself under the slogan "*your place to talk*" as a platform for communities of all types, particularly during the COVID-19 pandemic (Brown, 2020; Pierce, 2020). As of October 2021, Discord is hosting over 19 million active servers and 150 million monthly users globally (Discord, 2021a). The platform's recent growth in popularity, as well as its range of customizable user affordances, has seen the company struggle to control the proliferation of illegal content and misuse of server infrastructure ("Nelly", 2021; Pierce, 2020). Discord servers have been used by hackers and carders to buy and sell stolen data and spread malware (Brewster, 2019). "Far-right" racist and anti-Semitic content has also been disseminated on the platform (Brown, 2020; Glaser, 2018) and it has been linked to child-grooming cases ("Child abuse images being traded via secure apps," 2019). However, the company has remained largely silent on the topic of illegal drugs and Discord's most recent transparency report makes no explicit reference to its servers being used as drug markets ("Nelly", 2021).

In New Zealand, the use of Discord servers as local drug markets has been the subject of recent media coverage (Cornish, 2020; Harris, 2021; McKenzie, 2020), with references made to high levels of drug availability, violent "gang" assaults, and an increasing shift towards a commercialized local drug market. A recent survey of New Zealanders who use drugs (van der Sanden et al., 2021) identified the use of Discord for drug purchasing, with 9% of social media drug purchasers reporting using Discord to buy drugs in the previous six months, well behind Facebook (60%), Snapchat (48%), and Instagram (20%). Discord drug servers are generally set up to function as regional or city-specific marketplaces where drug sellers advertise openly to a network of buyers, much like the market dynamic identified in Facebook drug selling groups by researchers in Scandinavia (Demant et al., 2019). According to media reports, Discord drug servers have emerged as a particularly popular feature of the retail level drug market in New Zealand's capital city Wellington (Cornish, 2020; Harris, 2021), but servers have also been observed for other NZ cities and regions, as well as documented by media in South Australia (James, 2021).

Drug markets and online drug supply in New Zealand

Geographic isolation and small population centres play an important role in shaping drug accessibility and availability in New Zealand (Wilkins, Romeo, et al., 2018). These attributes contribute to a market division between drug types where there is active domestic manufacture and high availability – such as cannabis and methamphetamine – and those typically imported and where availability is less certain, such as MDMA and LSD. Historically, ‘street drug markets’ have not been a substantial feature of drug selling in New Zealand, with the exception of ‘tinny’ or drug houses where private residences operate as semi ‘open’ drug markets for cannabis purchasing (Wilkins et al., 2005). The Illicit Drug Monitoring System (IDMS), an interview-based survey of regular drug users in New Zealand’s major cities carried out annually from 2009 to 2016, found that cannabis and ecstasy/MDMA are most commonly purchased from ‘private house’ locations, followed by purchasing from an ‘agreed public location’ (Wilkins et al., 2017). However, IDMS respondents reported increasing drug purchasing from the “internet” (dark web, social media or other), particularly in relation to MDMA-type substances, with “internet” purchasing rising from 0% in 2009 to 15% in 2016 (Wilkins et al., 2017). More recently, van der Sanden et al. (2021) found that purchasing from “social media” is common for purchases of cannabis and ecstasy/MDMA in New Zealand (24% and 13% respectively). Research of online drug supply in New Zealand has been limited to date, although anecdotal media reports claim rates of darknet purchasing are increasing (Morrah, 2018), and that the use of social media for buying and selling is ‘increasing’ (Dillane, 2019; Marshall, 2021).

Drug market typologies and technology

Eck’s (1995) geographical model of offline illegal markets provides a framework for our analysis of Discord drug servers. Eck differentiates between drug markets comprised of personal networks and those consisting of strangers, arguing that the latter are more closely tied to particular offline geographic locations, given the absence of personal networks to connect buyer and seller. Appropriate geographic locations will tend to be familiar to both buyer and seller (or at least appear secure to both parties), facilitate communication, and typically concentrated in one area (Eck, 1995). When it comes to social media, Bakken and Demant (2019) have suggested there may be merit in considering different platforms as ‘*separate entities*’ (p. 256) in relation to their function as drug markets – a perspective we adopt in our analysis of Discord drug servers.

Distinctions between drug markets comprised of strangers or personal networks are commonly referred to as the drug market typologies of ‘open’ and ‘closed’ (Coomber, 2015;

Hough & Natarajan, 2000; May & Hough, 2004), or alternatively ‘public’ and ‘semi-public/private’ (Bakken & Demant, 2019; Sandberg, 2012). ‘Open’ drug markets are characterized by larger size, high accessibility and high visibility, while ‘closed’ markets (e.g., social supply or private houses) are smaller, less accessible, less visible, and lower risk (Eck, 1995; Hough & Natarajan, 2000; May & Hough, 2004).

Digital technologies, such as the mobile phone, have played a central role in facilitating the shift from ‘open’ to ‘closed’ markets within the retail level of the drug market (Barendregt et al., 2006; Curtis et al., 2002; Dorn et al., 2002; Hough & Natarajan, 2000). However, distinctions between these typologies are increasingly complicated by technological innovation, which presents people who buy and sell drugs with a new and consistently evolving ‘geography’ in which to manage the risks of participation in an illegal market. For example, cryptomarkets, known colloquially as darknet markets (Barratt & Aldridge, 2016), are often large in size, and trust between anonymous network members is generated and maintained via a comprehensive online reputation system and third-party dispute resolution (Bakken et al., 2018; Przepiorka et al., 2017). Aldridge and Décarry-Hétu (2016) suggest cryptomarkets can be considered ‘anonymous open’ drug market structures, representing a combination of ‘open’ and ‘closed’ market features. The ‘anonymous open’ cryptomarket allows sellers to openly advertise their products, transact with strangers, and transcend local market constraints, while anonymity protects them from many of the ‘traditional’ pitfalls associated with this type of ‘open’ market dynamic in offline drug market contexts, such as risk of physical robbery or violence from other market members. Additionally, the anonymity of cryptomarkets allows participants to transact ‘openly’ without being identified by police (Aldridge & Décarry-Hétu, 2016).

Social media platforms lend themselves to a diversity of social functions and relational contexts. Researchers in Scandinavia suggest social media drug markets can be conceptualized along a continuum ranging from ‘public’ (i.e., Facebook selling groups, dealer profiles on Instagram or Tinder) – characterized by open advertising and transactions with strangers, through to ‘semi-public’ (i.e., seller’s using Snapchat to advertise to a small group of buyers), and ‘private’ (i.e., one-to-one exchanges on messaging apps), both of which generally involve transactions within trusted networks (Bakken & Demant, 2019). Given what is currently a small body of research exploring the emergence of social media drug markets, there remains considerable scope to explore how levels of drug market openness function within and across different platforms and local market contexts.

In this article we explore how one platform – Discord – facilitates different buying and selling dynamics within the context of New Zealand’s retail level illegal drug market. We draw on theory of illegal drug market typology outlined above to understand how the Discord platform acts as a unique ‘geographic location’, facilitating a variety of drug market dynamics based on differing levels of market openness. We discuss how Discord drug servers that were higher in market openness increased buyer and seller vulnerability to drug market harms such as robbery or violent altercations, adulterated or fake drugs and exposure to law enforcement. Conversely those that were more ‘closed’ offered greater protection to their members from these risks while also facilitating the potential for a beneficial, competitive trading environment. To conceptualize this drug market variation in a platform-specific way, we use the terms ‘lower tier’ and ‘higher tier’ to distinguish between different drug server types based on ease of entry and drug server accessibility.

Studies describing evolutions in drug market structure provide an important means of understanding drug market characteristics and related harms, as well as resulting trends in drug use. This in turn feeds into the development of policy, harm reduction initiatives and police responses.

Methods

The emergence of Discord drug servers for the buying and selling of illegal drugs was investigated using a combination of anonymous online interviews with people who use Discord drug servers and observational data collected as part of a broader mixed methods project examining the use of social media drug markets in New Zealand.

Synchronous online chat interviews (Barratt, 2012) with 12 Discord drug market participants were carried out from August 2020 to September 2021. The interview schedule was semi-structured and developed based on a comprehensive literature review and an earlier large-scale quantitative survey of social media drug markets (van der Sanden et al., 2021). A semi structured approach was chosen to allow for adaptability across a wide range of different app types and market roles, as well as to facilitate interview flexibility and responsiveness to novel behaviours and experiences (Brinkmann & Kvale, 2015). Topics included in the interview schedule were how and why specific apps are used to purchase/sell drugs, broader patterns of non-drug related social media use, and perspectives on physical safety and drug quality when using a given app to purchase/sell drugs.

To encourage frank and open disclosure by interviewees, the interviews were carried out via the anonymous encrypted chat-app “Wickr Me” (referred to as Wickr throughout the paper). It was assumed participants would feel more comfortable about sharing their experiences via direct anonymous messaging (Barratt, 2012). Wickr has previously been used in research with social media drug sellers internationally (Demant et al., 2019), as well as with surface web cannabis sellers and buyers (Childs et al., 2022).

Participants were recruited using a targeted approach (Watters & Biernacki, 1989), The study was advertised on New Zealand specific subreddits, and in Facebook groups related to drugs such as cannabis or psychedelics and dance music genres often associated with specific types of drug use (Forsyth et al., 1997). Hard copy adverts for the study were also physically distributed at a dance music festival in Auckland and the advert was posted online via the New Zealand drug checking service *Know Your Stuff* social media pages (Facebook, Instagram, and Twitter). In order to participate respondents had to be aged over 16 and have used social media to buy and/or sell illegal drugs in New Zealand. Interviews were completed online over several hours, or in some cases over several days (due to breaks between ongoing messaging), with the longest interview taking five days to complete. The median length of interview transcripts (chat logs formatted into word documents) was 9 standard pages, with the shortest being 7 pages and the longest 18. Participants were offered a supermarket voucher as reimbursement for their time.

In total, 12 participants with Discord drug server experience were interviewed, five of whom also took part in a follow-up interview via Wickr approximately six months after their initial interview. Follow-up interviews were aimed at further developing the research team’s understanding of social media drug markets by providing an opportunity to clarify initial interpretations, as well as ask questions on topics that had emerged from interviews with other participants.

Additionally, one of the researchers created a Discord account to join several large Discord servers that were accessible via reddit. One of these was based on the discussion of general national news topics (r/NewZealand), and the other was connected to reddit’s r/drugs community. This was done to corroborate basic elements of drug servers reported by interview participants, such as basic server layout and functions.

Partway through the interviewing, one participant shared several invite-links for Discord drug servers in the Wellington region. Three servers were subsequently joined in late October of 2020, and by January 2021 the research team’s drug server membership had expanded to seven servers by virtue of drug server invite-links often being shared publicly by other server members.

Additional Discord servers were joined based on server size (i.e., upwards of 400 members) and the public availability of invite-links. Unobtrusive observation was used in this instance to gain an understanding of the drug server environment as it normally functions, unimpacted by an overt researcher presence (Burles & Bally, 2018; Gibbs & Hall, 2021; Kozinets, 2002). The validity and ethical implications of unobtrusive data collection in online spaces – ‘lurking’ – has been much debated in academic circles (Berning & Hardon, 2019; Ferguson, 2017b). Therefore, data collection focused on broad categories of server attributes and no identifying information contained in server posts, such as photographs, phone numbers, or social media details (doxing) of other members, was collected. Moreover, all data were kept on a password-protected university hard drive. Structured observation of all seven Discord servers was conducted from mid-January through to mid-April of 2021. The servers were observed weekly, and screenshots taken based on four principal categories: “server layout”, “seller adverts”, “seller reviews and buyer requests”, and “scamming allegations”. In total 570 screenshots were taken during the observation period.

Data were analysed thematically in NVivo using Braun and Clarke’s Six-Step Thematic Analysis Framework (Braun & Clarke, 2006). Development of coding structures and themes combined deductive elements drawn from existing literature with inductive findings generated from the interview data. Initial analysis involved coding interviews by hand based on basic descriptive criteria such as app types used, drug supply connections and seller types, perceived risks and negative experiences, as well as topics of online privacy and elements of recreational drug use such as drug quality and price. Once coded, data were checked cyclically, with codes revised as data collection progressed and analysis developed. Memos were made by the researchers for each ‘parent code’, detailing developments in thinking and referencing interview participants whose experiences were of particular importance to the essence of the code. Screenshots were checked and a small sample of examples from each of the four observational categories coded alongside the interview transcripts to embed the observational data in the analysis.

The research team has opted to retain original language used by participants in the interview excerpts presented below. Slang terms are clarified in non-italicized parentheses.

This research received ethics approval from Massey University Human Ethics Committee Southern A (Application code: SOA 20/22).

Findings

Demographics

Of the 12 interview participants who used Discord for the purposes of drug buying or selling, nine only used the servers to buy, while two used them to buy and sell, and one had experience as a server administrator as well as with buying and selling. The median age of the sample was 21.5 years (IQR=19-25.5), with the youngest interviewee aged 18, and the oldest aged 39. Five interviewees identified as female and seven as male. Three interviewees were from the Auckland (New Zealand's largest city), three from Otago (a largely rural region in New Zealand's South Island), with the remaining seven located in the Wellington region (New Zealand's capital and third largest city).

The basic elements of a Discord drug server

Observation of Discord servers used as drug markets revealed a range of commonalities in structure and function. The Discord drug servers examined were all specific to the Wellington city and region, however interview participants also cited membership of New Zealand-wide or South Island drug servers. Members of these drug servers could order drugs from sellers located around the country. The drugs would then be sent by post with payment made via bank transfer or cryptocurrency. However, both the observational and interview data indicated this type of arrangement was relatively rare, with drug transactions organized via Discord's private messaging system typically completed via in-person pick up or delivery, with payment in cash.

Drug server sizes differed considerably, with some servers accommodating thousands of members and others no more than 30. Of the Discord drug servers observed, the largest had almost 3,500 members at the time of joining, while the smallest had just over 400. However, interview participants cited membership of considerably smaller drug servers, some of which were 'seller-specific' drug servers used by individual sellers to advertise and connect with only already trusted buyers, in contrast to the open marketplace function of their larger counterparts. Based on observational and interview data the most common drug type sold via Discord drug servers was cannabis (i.e., flower, mentioned by 10 interviewees – n = 10), followed by MDMA powder (n = 7), psychedelics (i.e., LSD and magic mushrooms, n = 6), and pharmaceuticals (i.e., benzodiazepines, painkillers, study drugs, n = 5). Many servers included a 'server rules' channel specifying what was and was not permitted on the drug server. As well as including threats to ban members if they were violent or scammed others, 'rules' usually specifically banned the sale of

more 'serious' drug types such as methamphetamine and heroin. However, methamphetamine in particular was highlighted as still widely available via private message, and in some cases was traded openly (see "ice" channel in Figure 8).

Figure 8 provides an example of the typical elements of a drug server layout. Channels are generally separated by drug-type, and additionally by advertising and requests, or by delivery method (i.e., drop off, pick up). Most servers also contain channels enabling buyers to leave informal reviews or 'vouches' for sellers and their product (Figure 8, "shout-outs"), as well as for reporting scams or robberies by other server members (Figure 8, "ripoffs-complaints").

Figures 9 and 10 represent examples of the typical structure of seller advertisements in these environments. Advertisements include information on the product type(s) available, weights and prices, and delivery options, such as whether and where they are available for physical drop offs. Most advertisements include photos of the product, and more recently reagent test results for drug types such as MDMA (see Figure 8). Cannabis adverts will generally also specify whether a product is grown indoors or outdoors and may specify strain. Adverts are typically reposted almost daily until the product is sold and the same adverts are used by sellers to advertise in multiple different drug servers.

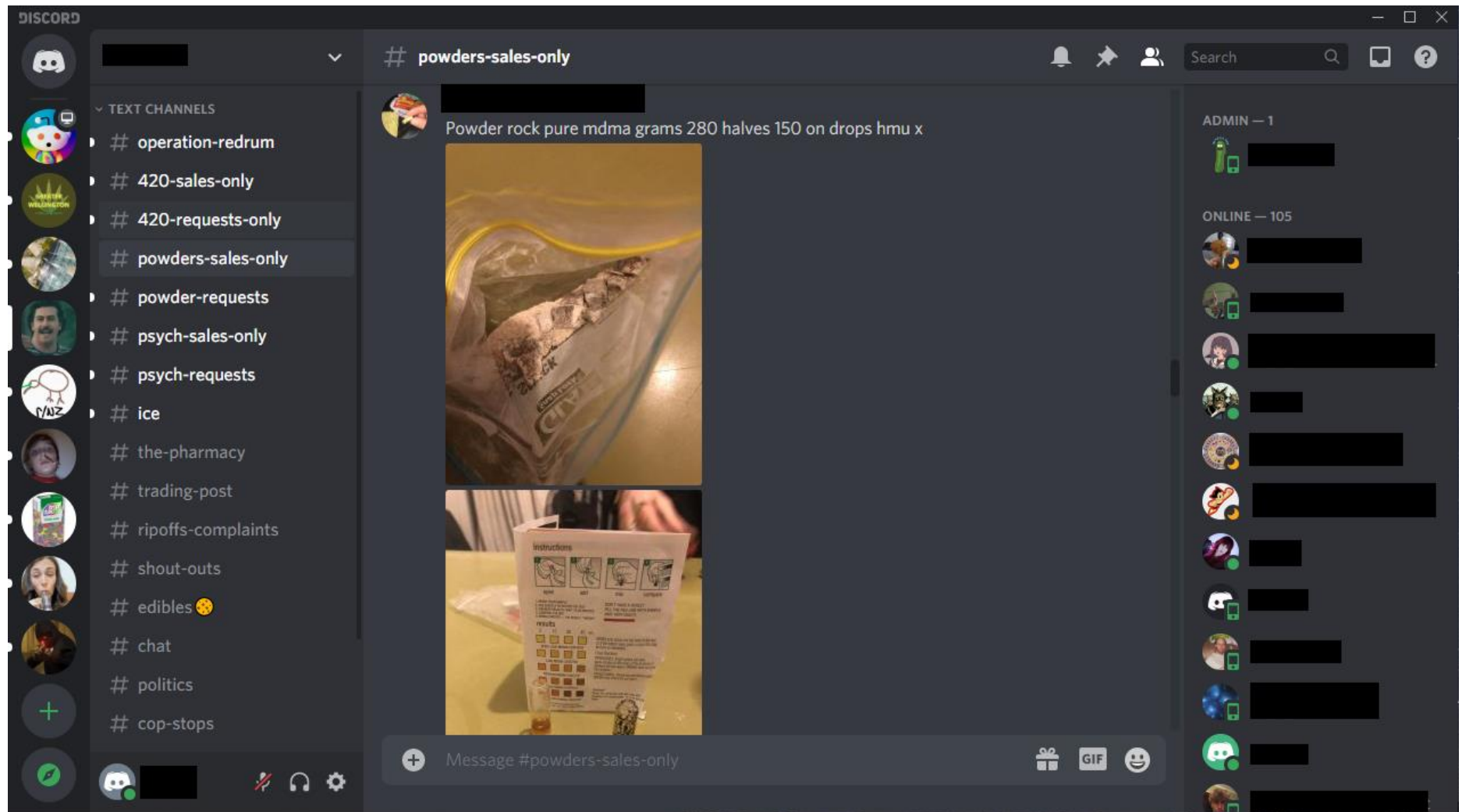


Figure 8: An example of how a drug server is typically laid out.

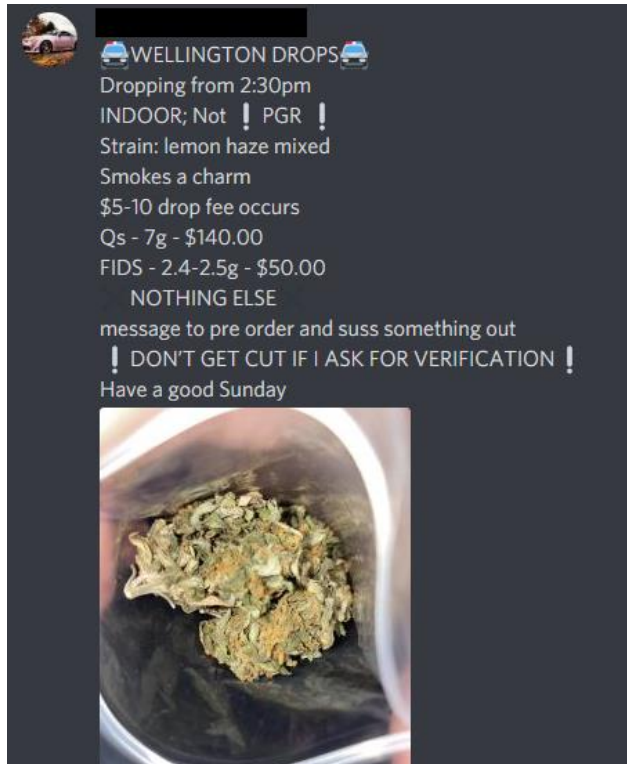


Figure 9: An advert for cannabis posted to a drug server including information on strain, weights available, and additional charges for drop offs.

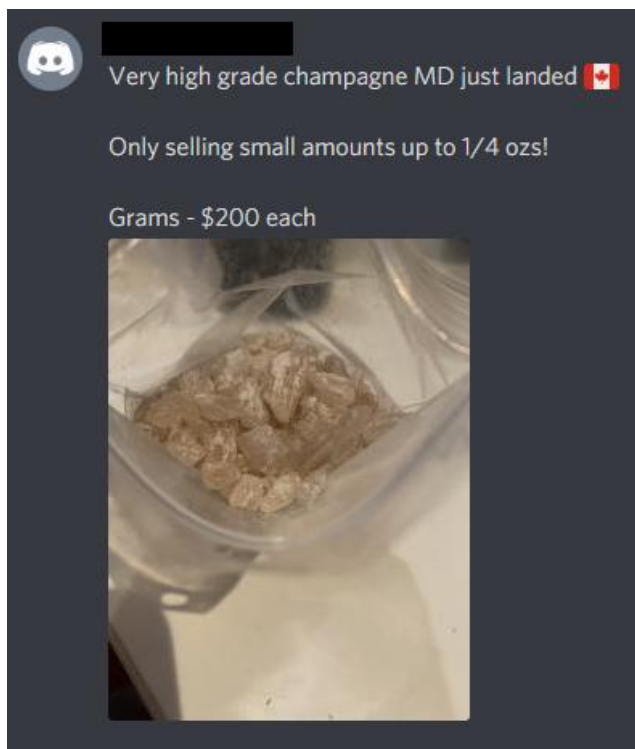


Figure 10: A more basic advert for imported MDMA.

Motives for using Discord

Many interview participants were already familiar with the Discord app from prior experience using the platform for online gaming, chatting with friends, or accessing communities related to their hobbies (n=7). However, the majority of participants (n=8) used Discord ‘mostly’ or exclusively for drug buying or selling. This highlights that Discord drug servers were considered an innovative and convenient means of locally sourcing drugs, as evidenced in the quote below:

“You pick your dealer and product, send them a private message and the majority of the time they deliver to your door...the first time I used discord and made an order, it was at my house within ten minutes.” (P7 – Buyer, M39, Wellington)

Along with the convenience of delivery options, interviewees emphasized the choice of products, which were often available in larger amounts and at what were perceived as lower prices (Moeller et al., 2021) compared to what they could access via existing contacts by virtue of the greater number of sellers and therefore competition between Discord sellers:

“I found it much easier to secure ounces as there are many sellers. Another factor was the supply, not many ounce dealers I knew did delivery but many do on the Discord (server). I was also able to find dealers who lived nearby so I could pick up from them.” (P14 – Buyer, M22, Auckland)

“Larger diversity, many sellers seem to have several options to pick from. I've also found it to have better prices than other options. Having all the sellers together and showing their products and prices seems to make it much more competitive.” (P23 – Buyer, M23 Otago)

Interviewees often cited having previously sourced drugs casually via friends and social connections, or from sellers who were often out of stock or sold expensive, lower quality drugs. As a result, many joined Discord drug servers for the easier access provided to a wide variety of different drug types not so readily available in their own networks. Several younger interviewees identified Discord drug servers as their first experience of buying drugs independently from commercial sellers (n=4). The presence among the interviewees of novice drug purchasers citing

relatively low levels of stable or satisfactory drug access via their own networks provides an indication of both the attraction and accessibility of Discord drug servers for this group.

'Higher tier' and 'lower tier' drug servers: Invite-links and server membership

The Discord servers could be joined via a temporarily valid invite-link sent by an existing member, or in some cases posted publicly to other drug servers. Invite-links were also reportedly accessible via drug-related communities on platforms such as reddit. The majority of interviewees reported receiving invite-links to join Discord drug servers via their social networks, with many invite-links circulated widely within local networks of young people via messaging platforms.

On joining a server, a new member was generally required to 'verify' themselves to the server administrator to 'prove' their legitimacy. In most servers this consisted of a time-stamped image containing used drug paraphernalia and/or drugs as well as a piece of paper specifying username, date, and market role. However, interviewees highlighted that membership of some drug servers required additional verification measures, such as screenshots of successful trades with known sellers, or in some cases the submission of an anonymized ID such as a driver license to establish date of birth. New members were often only given access to a 'welcome' channel prior to receiving verified status, at which point they could access the wider server. Similar practices have also been reported in other online drug markets, such as Facebook drug selling groups where new group entrants may need to prove they are 'drug wise' by answering questions set by group administrators (Demant et al., 2019). On the cannabis website *LeafedOut* buyers and sellers often sent each other selfies before a transaction to establish trust (Childs et al., 2022).

Server administrators set out and regulated the verification process on their respective drug server using Discord's inbuilt permissions functions, which allow them to set and assign customized roles to server members to control how they can interact with the server (Discord, 2021b). Verification procedures therefore tended to vary from server to server, ranging from rigorous through to completely absent. For example, the server shown in Figure 8 did *not* require verification to view or post in server channels and the research team joined it via an invite-link posted to another drug server. Only one of the drug servers joined required verification to access the selling channels.

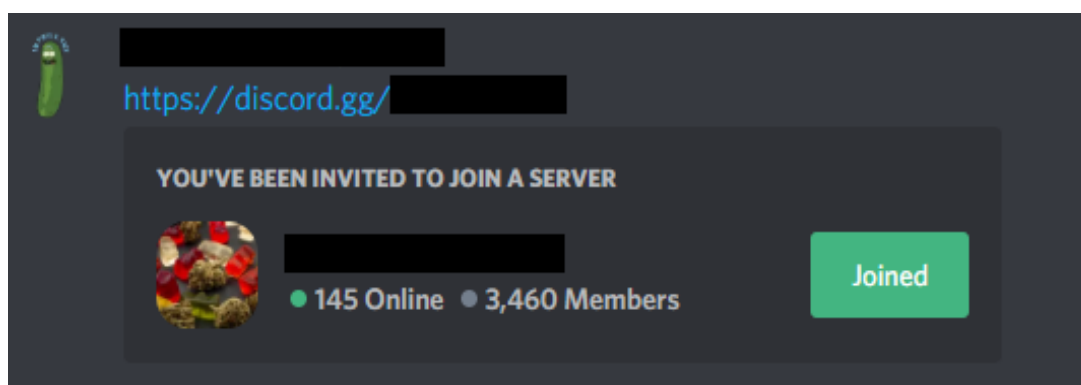


Figure 11: An invite link for a large drug server posted to the main chat of another drug server.

Drug server administrators determined the degree to which invite-links could be freely shared, and who could share them. In general, drug servers with limited controls around the sharing of invite-links were easier to access, and larger in size. We term drug servers with these attributes 'lower tier' by virtue of their higher openness and low barriers to entry (Bakken & Demant, 2019; Eck, 1995). On 'lower tier' servers, invite-links to new servers were routinely shared on existing servers (Figure 11), or requested publicly by members, facilitating the expansion of membership to many different drug servers at a given time (See also, Bakken & Demant, 2019). For example, among the interviewees, membership ranged from 1 through to 40 different Discord drug servers, with a median of 5 (IQR=1.5-17.5):

"There's hundreds of them so there's always new people on different servers... I'd say 40ish (servers) I mean there's always new ones popping up here and there, some just fizzle out." (P29 – Buyer/seller, M19, Auckland)

While the ability to continuously locate new buyers and sellers by joining additional Discord drug servers was cited as a key advantage of their use, many interviewees also noted considerable overlap between different server populations:

"I would see them post in a server called something like "welly sales" and then join another group later called like "drugz wellys" (not real names lol) and see they were selling there too." (P6 – Buyer, F19, Wellington)

Notably, encountering the same members across different servers was not perceived as problematic among interviewees. In fact, several emphasized the overlap between drug server populations as a useful means of assessing the legitimacy of other members, particularly sellers:

“Usually before I buy from someone I’ll click their profile and it’ll say how many mutual servers we’re in. That number is usually about 5 or 6.” (P10 – buyer, M21, Wellington)

In cases where server membership is more selective, server administrators often combine tough verification requirements with heavy restrictions on inviting new members. Interviewees indicated these restrictions could take a variety of different forms, such as permitting only certain server members to send invite-links (i.e., verified sellers), capping the number of invite-links members could send, or suspending the ability to invite new members altogether. One interviewee explained their preference for using this type of server:

“High security. Generally smaller. Must be invited by verified dealers. Have to show pictures of gear (drugs) to get in and have been on Discord a while. Some will only let you in if you’re on another tight server... Generally have more stuff, better prices and larger amounts...The others are bigger, mostly weed and expensive gear and filled with noobs (inexperienced buyers/sellers). Dodgier too.” (P25 – Buyer, M27 Wellington)

The drug server described above provides an example of what we term ‘higher tier’ Discord drug servers, which display higher levels of drug market closedness (Eck, 1995; May & Hough, 2004). Entry into ‘higher tier’ drug servers is dependent on existing connections to known sellers on Discord, or alternatively cultivated via participation in other drug server communities and ongoing interactions with other community members (Holt et al., 2014). As a result, ‘higher tier’ drug servers are more difficult to enter for younger novice drug buyers, who often participate in ‘lower tier’ servers where invite-links are more easily accessible. The ease of access characteristic of many ‘lower tier’ drug servers, and the large size of resulting markets means that participating buyers and sellers may be at higher risk of falling victim to opportunistic behaviour such as rip off, robbery and occasionally assault.

‘Undesirables’: Opportunism in a drug server

Opportunistic behaviours such as scams and robberies were alleged to be commonplace by many interview participants who were members of ‘lower tier’ drug servers:

“The seller I thought was legit, turned out to be a scammer actually.” (P1 – Buyer, F19, Otago)

“Got hit over the head with a baseball bat last year a buyer turned up with his mates at night for a deal and rolled me for everything I had during quarantine (COVID-19 lockdown) ... Stuff like that happens every week on the servers.” (P29 – buyer/seller, M19, Auckland)

Figures 12 and 13 provide examples of standard posts to a Discord drug server’s ‘scam’ channel to alert other users of unreliable sellers, buyers, and products. Based on observational data, most posts to ‘scam’ channels concern the purchasing of ‘fake’ or underweight drugs (Figure 13), or reports of cash, drugs, and phones stolen during a trade (Figure 12). Interviewed drug server members often linked the presence of ‘undesirables’ on a Discord drug server to some of New Zealand’s patched gangs and their prospects, a perception echoed in the New Zealand media (Cornish, 2020). Confirming these allegations is beyond the scope of this study, however gangs have previously been identified as playing a role in New Zealand’s retail drug markets, particularly for drug types such as cannabis and methamphetamine (Gilbert, 2013; Savage, 2020; Wilkins, Romeo, et al., 2018).

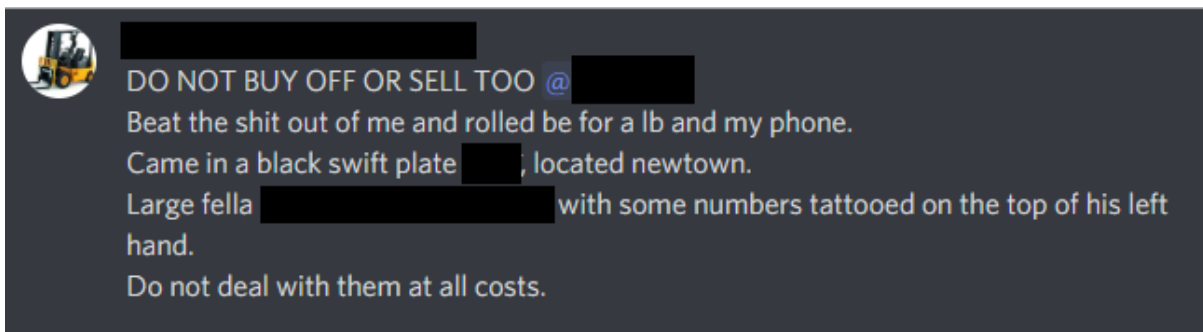


Figure 12: An example of a seller post in a drug server's 'scam' channel letting others know they were robbed during a trade.

Allegations of scam behaviors often included the tagging of the member in question and the sharing of screenshots of private messages as ‘proof’ (Figure 13). However, the ease with which usernames can be changed and new servers joined make it difficult to identify scammers. Server members disproportionately relied on informal trust-building mechanisms, such as the practice of asking for ‘vouches’ (Figure 14) from other server members (See also, Bakken & Demant, 2019; Childs et al., 2022), or staying informed about ongoing scam allegations across multiple drug servers (Figure 13). These dynamics resulted in individual server members being seen as responsible for their own safety in these settings:

“I've also seen people complaining a lot about getting scammed or rolled and they post screenshots but a lot of the time the accounts they were buying from weren't

verified, are only on that one server or whatever so it's kinda like what were you thinking.” (P10 – buyer, M21, Wellington)

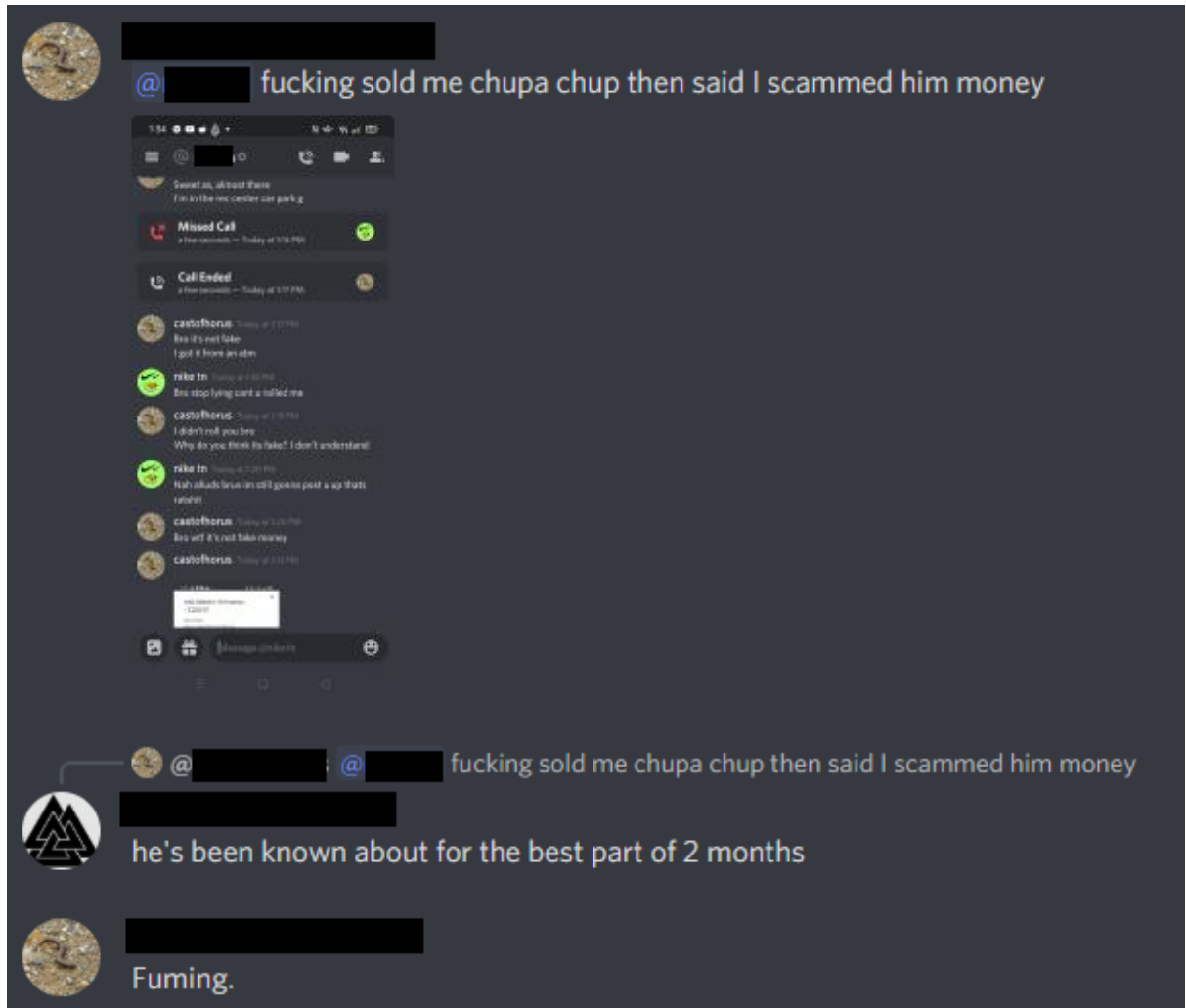


Figure 13: A typical example of a buyer being scammed into paying for fake product and using screenshots of private messages as evidence. The responding member states that this as a known scam account.

The provision of ‘vouches’ was discretionary (Figure 14), and any member could effectively ‘vouch’ for another irrespective of prior transactions. Drug server members could either post ‘vouches’ or ask for ‘vouches’ from other members, a two-way communication feature that several interview participants found useful as a means of determining who to buy from and sell to. However, the observational data highlighted what at times appeared to be a messy system, where messages were not always responded to. Sifting through ‘vouches’ and following ongoing scam allegations across different servers was cited as time consuming by some interviewees, highlighting what in many ‘lower tier’ drug servers could be the considerable individual ‘legwork’ involved in learning the best ways to avoid being ripped off or robbed when using Discord to buy

and sell (Kowalski et al., 2019) in the absence of robust platform infrastructure and institutionalized means of engendering trust between market participants.

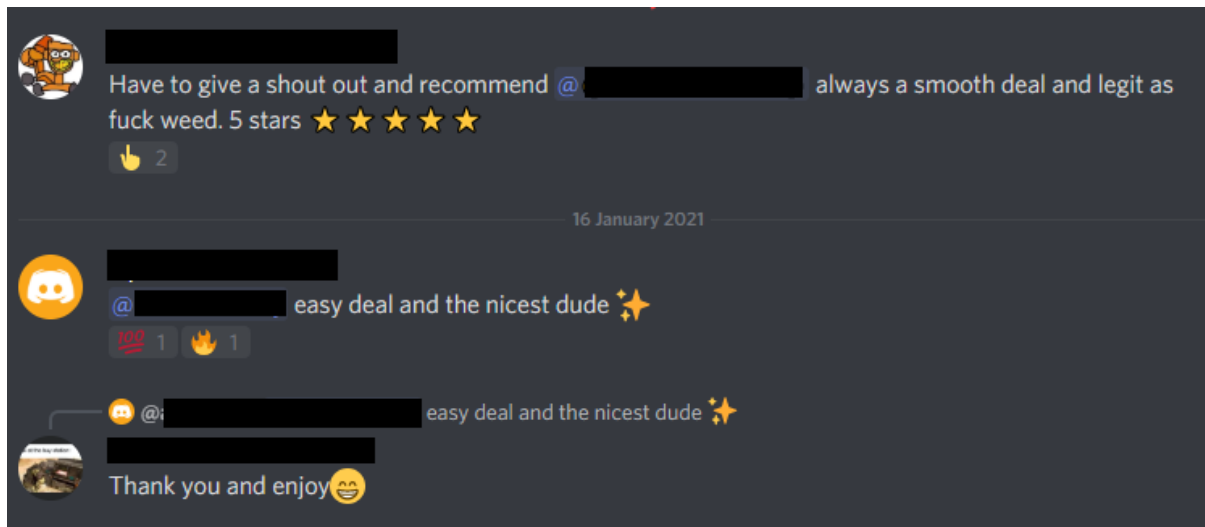


Figure 14: Examples of informal 'vouches' provided for Discord sellers.

In comparison, interviewees with membership of 'higher tier' drug server cited relatively low concern about exposure to 'undesirables' or scamming behaviours by virtue of tighter controls on server entry. Interviewees often cited the importance of a robust verification process for legitimate server members as an important way for a Discord drug server to create some clarity around which sellers and buyers were reliable. However, some interviewees in 'higher tier' drug servers also cited the use of other features intended to create a more stable representation of reputation among members. One such feature incorporates the use of Discord 'bots' (a range of customizable, command-based AIs that allow server administrators to automate server management tasks) to create a more formal construct of seller reputation:

"It's a discord bot which gives a user 1 point. This bot has commands such as ".rep @username" which gives users the ability to give a point to a seller. The bot can also display a 'leaderboard' ranking server members based on these points." (P14 – buyer, M22, Auckland)

The extent to which such features are incorporated into a Discord drug server, as well as whether scamming and robberies proliferate among market participants, highlights the importance of server administration and management to the success of a drug server and the safety of server members.

Drug server management

The presence of server administrators on Discord drug servers adds elements of third-party management to this environment, in a manner somewhat reminiscent of cryptomarkets (Moeller et al., 2017). Foundationally, server administrators are responsible for determining the level of drug server openness, and how Discord features such as 'roles' and 'bots' will be used to manage member behaviour. However, both the observational and interview data highlighted considerable ambiguity around the role of Discord drug server administrators in relation to local offline drug markets, as well as their motives for managing a drug server:

"Sometimes they don't appear to sell. Maybe they're selling to the dealers but sometimes I struggle to see what they get out of it... to be honest that part is a mystery though." (P25 – buyer, M27, Wellington)

In some cases, the market role played by drug server management appeared relatively clear-cut, particularly in cases where server administrators could be seen advertising in drug server channels – as was the case in three of the seven observed drug servers. Similarly, ex-drug server administrator (P15) referenced themselves as part of a 'group of sellers' collaborating to build several Discord drug servers.

In 'lower tier' drug servers, the calibre of drug server management could be highly variable, or entirely absent leading to a proliferation of 'abandoned' drug servers. Server members alleged that many 'lower tier' drug servers are run by gang affiliates, or alternatively highlighted the presence of official gang servers distinguishable by openly signalled gang patches and the sale of drug types such as methamphetamine:

"Some have a (gang) patch as the server image and are overtly gang related. Some are more stealth (discreet) but defs got heavy gang connections among admin... Or meth GBL, h (heroin)... stuff like that for sale. It doesn't take a rocket scientist but again I avoid them so don't examine them too hard." (P25 – buyer, M27, Wellington)

The above quote reflects how the Discord drug server members interviewed used a diverse range of factors to assess the quality of server management to make judgments about the legitimacy of the drug server as a whole. This practice in turn helped to inform them about the nature and credibility of individual members, and therefore also the risk of using a drug server to buy or sell. Spreading membership across different drug servers – particularly in 'lower tier' server environments - was therefore an important means through which buyers and sellers learnt to

navigate a highly variable drug market environment by assessing drug server features indicative of a more robust level of server management:

“Generally, after joining the first few (servers), the moment I joined (another) one, I would start judging what I thought of it from its members (any familiar ones) and verification were key parts I looked for... I found servers which participated in encouraging harm reduction I trusted more. And servers with a proper tallied seller rating also helped. And lastly just active admin/ general chat/ discussion channels.”

(P23 – buyer, M21, Otago)

The shroud of mystery often surrounding server administrators and feeding into the proliferation of ‘abandoned’ or questionably managed servers can be linked to the low technological barriers to establishing a drug server using the Discord platform. Interviewees, including buyers, highlighted the discrepancy they perceived between the ease of establishing servers and the difficulty of managing the resulting community, particularly for servers with large memberships:

“Setting up a server is really easy, it’s the maintaining it, keeping an eye on the messages etc that seems to be the hard bit... I’ve seen servers set up and pretty much anyone can enter, at some point they’ve realised that they’ve set the thing up wrong, offered it to someone else to look after and set up another server with better security measures.” (P7 – Buyer, M39, Wellington)

“Up here (Auckland), most vendors knew each other at least in passing. Down there (Wellington) it was less the case, and when stuff like gankings (assaults/robberies) from gang prospects happened it was really difficult to unpack who was letting who in and how they kept getting back in.” (P15 – ex-server admin/seller/buyer, F31, Auckland)

As a result of the workload of managing a larger server, many administrators also recruit moderators, and may take steps such as suspending the ability to invite new members when servers become too large. Four of the seven Discord drug servers observed had administrators who actively policed the markets (Figure 15), and interviewees who were members of well-managed servers cited feelings of safety when transacting in an effectively policed drug market:

“I have a much better sense of security with the Discord server since it’s a marketplace. There are moderators who take safety and security seriously and will

sometimes temporarily stop new people to enter if a seller is compromised. I generally don't have any safety concerns.” (P14 – Buyer, M22, Auckland)

The potential for Discord drug server management to sustain lower risk, moderated selling environments in the form of ‘higher tier’ drug servers contrasts with the characteristics of ‘lower tier’ drug servers where server management appeared to struggle to keep pace with opportunism and scams. In ‘lower tier’ environments server features like seller verification and active administrators were not robust enough to manage the resulting market without the added security of controlled server entry and invite links. Choices made by drug server administrators around controlling server entry and accessibility also play a pivotal role in levels of drug server visibility and risk of arrest or exposure to police.

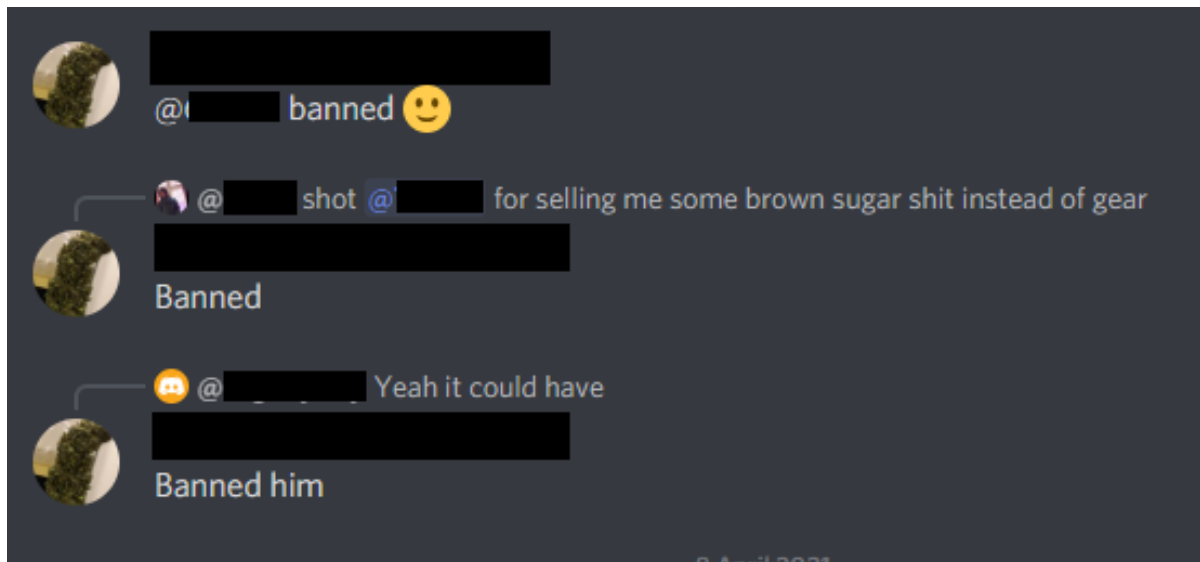


Figure 15: A server administrator publicly responds to scam allegations to let other members know which scam accounts have been banned.

Visibility on a drug server

The accessibility of many ‘lower tier’ Discord drug servers and the visibility arising from the high-profile victimization associated with some offline transactions meant the threat of police infiltration was perceived as high by many interview participants, particularly those involved in selling or managing the servers:

“The threat of police infiltration is real - a whole bunch of people who trap (sell) thru the servers have been caught and imprisoned in the short period since I started.” (P15, ex-server admin/seller/buyer, F31, Auckland)

This sentiment contrasts with those of interviewees citing membership to ‘higher tier’ drug servers, where strict entry controls and a more networked server structure prevented the entry of unvetted members. On several of the ‘lower tier’ drug servers observed, members of the community were often seen updating one another on the presence of local police checkpoints (Holt et al., 2008). Though police were acknowledged as a threat, server members – particularly buyers – were quick to place themselves as “small fish” of little interest to police:

“I’m always cautious but in reality I never buy in bulk, and even if I did get caught nothing that bad would happen.” (P33 – Buyer, F18, Wellington)

“Ah not really who cares in the long run I don’t have any photos of myself on the accounts and it’s not like government authorities would give a shit about one guy dealing.” (P29 – Buyer/seller, M19, Wellington)

Notably, an overlap between the use of Discord for other, social purposes alongside drug server memberships meant that several interviewees purchased drugs via Discord profiles they had previously used for non-drug related purposes. As a result, some interviewees realized they had been unintentionally sharing personal information via integrated Spotify links or usernames. Issues such as this indicate what appeared to be a relative lack of user awareness around online security measures, and precisely how much information they might be sharing with third parties in these settings.

Discussion

Discord drug markets are a new trend in New Zealand social media drug markets. Discord drug servers appear to offer seller contacts to younger and novice drug buyers who may not otherwise have these connections in their personal networks (Demant & Bakken, 2019). They provide a competitive local drug market with pick-up and delivery options and considerable choice of product and sellers. In the New Zealand context, the Discord drug server model is reflective of the ‘uberisation’ of retail drug markets internationally (EMCDDA, 2018b; Sjøgaard, 2019). Sjøgaard (2019) has described this trend as competitive drug market structures encouraging dealers to “promote services beyond the product itself” (p. 215), such as quick delivery. New Zealand’s small population and geographically isolated drug market (Wilkins et al., 2017) may play a role in enabling unique social media drug market arrangements, given the smaller size of the local market and relatively low levels of drug market violence. Furthermore, the increasing presence and

discussion of drug content online and on social media globally (Barratt, 2011) may further encourage the development of unique local online drug purchasing patterns.

Discord drug servers bear similarities to Facebook drug selling groups (Demant et al., 2019), or group chats on messaging platforms such as Telegram (Blankers et al., 2021), which enable similarly competitive selling environments and are typically also 'managed' by a group 'administrator' who grants access to new members, and where membership of many different selling groups is also commonplace (Demant et al., 2019). Bakken and Demant have termed groups such as these 'public digital markets' by virtue of their typically high levels of openness and ease of access (Bakken & Demant, 2019). However, the ability to customize drug server layout and security features to produce various levels of market openness, coupled with the importance of server administrators in shaping resulting buyer and seller behaviours make Discord a unique drug trading 'location' (Bakken & Demant, 2019). Additionally, Discord's association with gaming may mean drug servers are used by different groups of people compared to Facebook, or Telegram selling groups.

Our characterizations of Discord drug servers as either 'lower tier' or 'higher tier' reflect how drug server openness varied across different servers and the extent to which this influenced levels of opportunism, perceived risk of law enforcement infiltration and sustained the success of drug server trading. The risks of participation in 'lower tier' drug servers displayed considerable similarities to 'open' drug market typologies (May & Hough, 2004) and were generally characterised by ease of access, larger size, variable server management, and a proliferation of opportunistic robbery and scamming behaviours among members (e.g., Jacques et al., 2014; Topalli et al., 2002). These drug servers generally had few controls on the sharing of invite-links, few verification requirements – particularly for new buyers, and limited use of discord server features such as 'bots' or 'rep.' points. Server administrators often played a less active role in managing 'lower tier' drug servers or were entirely absent.

Tighter control and oversight generally characterise 'higher tier' servers, where the sending of invite-links was tightly regulated, and server membership was more closely predicated on offline network ties or established trust between server members akin to 'closed' drug markets (May & Hough, 2004). Discord servers such as these were generally smaller, with invite links more tightly controlled by server administrators, and sometimes catered to a more 'serious', well-connected clientele (Adler, 1993; Bouchard & Nguyen, 2010; Morselli & Tremblay, 2004; Ruggiero & South, 1997). It is notable, that 'higher tier' drug servers still afford their users several features more typically associated with 'public digital' or 'open' drug markets, such as providing sellers with

an ability to advertise and sell to a wider range of trustworthy customers than would be the case in fully ‘closed’ or ‘private digital’ markets (Bakken & Demant, 2019; May & Hough, 2004). As such, ‘higher tier’ drug servers used Discord features to extend trust-based local drug connections by combining ‘closed’ or established drug networks. To leverage the benefits of a more ‘open’ drug market structure without putting buyers and sellers at additional risk of opportunism and arrest, Discord drug servers needed to maintain some degree of market closedness. This mixing of different drug market dynamics in the Discord context mirrors the ways in which levels of drug market openness shift in offline contexts in response to threats from policing and violence (Eck, 1995).

The contrast between ‘lower tier’ Discord drug servers comprised largely of strangers and ‘higher tier’ servers based more heavily on some level of established trust between members highlights an incongruity between the *technical* ease of establishing a drug server on Discord, and the difficulty of managing the resulting illegal market. Though conducive to establishing and maintaining ‘closed’ more strongly *networked* drug markets in the ‘higher tier’ drug servers, the question of whether Discord infrastructure is robust enough to formalise trust between large groups of strangers, particularly instances where transactions are completed in person is an important one. This question highlights a core tension within ‘lower tier’ Discord drug servers – though an ‘open’ market dynamic is easily created using platform features, it may not be manageable in a context where buyers and sellers continue to trade in person.

The difficulties involved in managing ‘open’ drug market dynamics on Discord drug servers and the ‘traditional’ risks of in-person drug markets faced by server members distinguishes these environments from ‘anonymous open’ cryptomarkets (Aldridge & Décary-Héту, 2016). In cases where administrators place tight controls around invite links and use additional Discord features to manage members or create seller reputation metrics, larger drug servers appear to be conducive to some degree of beneficial ‘anonymous open’ market structure. In these cases, Discord servers can be used to maintain and build trust between members who often do not know one another personally, in a similar but more limited manner to cryptomarkets (e.g., Bakken et al., 2018; Przepiorka et al., 2017). Additionally, due to the variability of drug server management many buyers and sellers continue to transact in drug server environments where third-party protection is either absent or very limited. In these environments members rely on informal mechanisms such as assessing ‘mutual servers’, or ‘vouches’ to make judgements about other members’ trustworthiness (Childs et al., 2022; Holt et al., 2014). As a result, there is a considerable learning curve to navigating ‘lower tier’ drug servers ‘safely’, which may place novice buyers or

those new to using Discord at greater risk of harms such as robbery, assault or purchasing adulterated drugs.

The high visibility characteristic of ‘lower tier’ drug servers meant many interviewees expressed little doubt that police were already monitoring many drug servers. However, there was a relative lack of concern, particularly on the part of buyers, regarding the danger of police apprehension. This may in part be due to perceptions of anonymity arising out of larger network size (Bouchard & Ouellet, 2011; Kleiman, 1993) and server pseudonymity (Scott, 2004). However, it is likely that these attitudes also likely reflect the climate of normalization that exists around popular recreational drugs, and the role played by online content and communities in perpetuating these perceptions (e.g., Barratt, 2011; Petersen et al., 2021). Perceptions of normalization have been argued as a key factor in both enabling and sustaining ‘open’ drug trading on the surface web more generally (Childs et al., 2022; Demant et al., 2019), and it is likely that this is also feeding into the development of large social media drug markets such as Discord drug servers.

Though the threat posed by law enforcement may be perceived as low among server members, large, ‘lower tier’ drug servers – particularly those allowing for the sale of high-risk drug types like methamphetamine – arguably ‘invite’ law enforcement action (Bouchard, 2007; Eck & Gersh, 2000). The rapid rise of Discord drug servers in New Zealand also underscores the potential for social media platforms to continually carve out new spaces in which drug markets can develop. Indeed, Bouchard and Ouellet (2011) suggest that the development of largescale drug markets may reflect the discovery of an unfilled niche market environment that seemingly poses lowered risks of detection to buyers and sellers. As such, it could be suggested that large, ‘lower tier’ Discord drug servers may have been the temporary result of an initial ‘honeymoon’ period prior to major law enforcement awareness and action.

Notably, Discord has recently rolled out an anti-harassment AI tool to combat misuse of Discord infrastructure (Hatmaker, 2021; Kastrenakes, 2021). This development, which occurred after the data collection for this study, has resulted in the shutting down of many Wellington Discord drug servers, and disabling of members’ accounts – including the research team’s account. Events such as this highlight the ways in which measures taken by social media platforms themselves may have greater impact on the operation of social media drug markets than direct action from law enforcement agencies.

The development of Discord’s own response to platform misuse may impact the future of the Discord drug server construct as it exists in New Zealand. However, cumulatively, many of the

dilemmas and issues facing members of larger, 'lower tier' Discord drug servers (Cornish, 2020; Harris, 2021; McKenzie, 2020), may have similarly impacted the long-term viability of 'lower tier' drug servers as buyers and sellers opt for more stable, low-risk local trading arrangements. Participants cited making use of more reliable 'seller-specific' drug servers, which function as 'semi-public' drug markets where one seller advertises to a closed group of trusted buyers (Bakken & Demant, 2019). Furthermore, large, well-managed drug servers may also continue to exist on Discord, or shift to other, more secure platforms, with their members citing consistent drug quality, professional customer service, and the cultivation of a sense of 'community' as benefits reaped from their drug server involvement.

Limitations

Our observation of selected Discord servers and in-depth interviews of a small number of Discord drug market participants over a number of months are not intended to provide a complete picture of these markets. Rather the study provides an exploratory "snapshot" of these emerging drug markets, identifying key themes and questions for further investigation, as well as attempting to place social media drug markets in the wider context of illegal drug market structures.

We have endeavoured to ensure that the complexity and variation of the drug server environment is reflected in our study. It remains unclear to what extent Discord drug servers are being used in other countries, and how the structure and function of these servers may in turn differ from those we have described in New Zealand. Consideration of the use of Discord drug servers across different country contexts, or in relation to other illicit products, is an avenue for further research.

Conclusion

This paper presents the first exploratory analysis of the use of the social media app Discord to facilitate drug trading. Discord drug servers present a novel way for buyers and sellers of illegal drugs to connect and facilitate drug transactions in their local geographical areas. However, buyer and seller experiences using Discord drug server markets varied based on levels of drug server openness, size, and management, creating a separation between what we have termed 'lower tier' and 'higher tier' Discord drug servers. The high visibility and rates of opportunism characteristic of many 'lower tier' drug servers underscored an imbalance between the ease with which 'open' drug market structures can be facilitated using the Discord platform and the difficulty

of managing buying and selling between strangers when transactions remain rooted in a local, in-person transactional context. Adapting social media platforms for the purposes of drug trading may not always be simple or streamlined; rather each 'new' platform presents a distinct environment that repackages many of the 'traditional' challenges and constraints of illegal markets. Our paper helps to conceptualize how social media technology may lend itself to the enablement of different drug market structures and how these may be adapted over time by their users. This is particularly important given that quickly transforming social media technology and software will continue to facilitate evolving drug buying and selling practices in the future.

The Discord example points to the potential for exposure to increased drug- and drug market-related harms as part of this process of learning to use a new social media drug market. The accessibility, novelty and convenience of purchasing drugs through Discord came at a cost, particularly to younger, novice buyers, and low-level sellers, who are most likely to take part in more open 'lower tier' drug servers and therefore at higher risk of exposure to scams and adulterated substances, or physical violence. These risks are notable given that many of the transactions largely involve small amounts of drug types such as cannabis and MDMA (van der Sanden et al., 2021). The openness of 'lower tier' Discord servers may provide a valuable platform to engage with vulnerable groups about drug risks and provide harm reduction information (e.g., Davitadze et al., 2020).

As new iterations of social media drug markets continue to emerge, we suggest there is increasing need to prioritize broader policy changes that help counter the risks of unsafe products and seller violence and that reduce young people's need to potentially engage with high-risk illegal drug market situations to purchase or sell small amounts of drugs. We suggest that decriminalization and legalisation are powerful tools that may help in presenting young people with feasible alternatives to using social media drug markets. Without broader policy change it is likely that young people will continue to use these spaces for small-scale drug trades and grapple with the heightened risk of harm that may accompany them.

Chapter 7: 'Choice' of social media platform or encrypted messaging app to buy and sell illegal drugs

While Chapters 5 and 6 largely focus more on commercial social media drug markets in New Zealand, Chapter 7 provides contextualisation of a less commercial undercurrent that may also feed into social media drug trading: social supply. In doing so, it draws on polymedia theory (Section 3.2.2) to explore how the process of 'choosing' a particular platform to use for drug trading behaviours may be mediated by the drug market context, and nature of the relationship between buyer and seller. This is the first of three chapters that consider how the broader social media landscape may shape drug trading practices across different platforms. Chapter 7 draws on qualitative interview data. The paper was published in the *International Journal of Drug Policy* in October 2022.

van der Sanden, R., Wilkins, C., Rychert, M., & Barratt, M. J. (2022). 'Choice' of social media platform or encrypted messaging app to buy and sell illegal drugs. *International Journal of Drug Policy*, 108, 103819.

<https://doi.org/https://doi.org/10.1016/j.drugpo.2022.103819>

Abstract

Social media is increasingly being utilized to facilitate the buying and selling of illegal drugs, particularly by young people. However, the range of social media and messaging platforms means people must make 'choices' around which platforms they will use to conduct drug transactions. Polymedia theory suggests that people use different media to manage their social relationships, 'choosing' appropriate channels or platforms based on platform features and the social context of the relationship. This paper uses polymedia theory to explore how buyers and sellers navigate platform 'choice' for drug trading, and how this bears similarities to the ways in which they move between different platforms in their daily lives. We conducted anonymous online interviews with thirty-three people who buy and/or sell drugs via social media and encrypted messaging apps in New Zealand to explore the factors shaping their selection of platforms for drug transactions. Our findings highlight the importance of the relationship between the buyer and seller in shaping how interviewees weighted the relative importance of platform security and convenience. Though more commercial drug sellers exercised considerable influence in directing buyers of drugs towards a given platform, this pattern was less characteristic of how platform 'choice' was navigated in contexts of drug supply between friends. In social supply contexts, platform 'choices' were often not explicitly made, but rather exchanges were channelled through platforms already in use within the social group. We highlight the tensions that arise between seller preferences for a more secure platform and buyer preferences for greater convenience in contexts of friendship. Our findings highlight the importance of understanding social media drug market engagement as shaped by broader patterns of social media engagement, and the distinctions between different social contexts and personal relationships, consistent with polymedia theory.

Introduction

The use of social media platforms and encrypted messaging apps to buy and sell illegal drugs, particularly among younger age groups, has been the subject of significant media attention in recent years (e.g., Dillane, 2019; Ferguson, 2016; McCormick, 2021; Nichols, 2020). Academic study of this phenomenon remains in its early stages and is largely concentrated in the drug research field (Bakken & Demant, 2019; Barratt et al., 2021; Blankers et al., 2021; Demant et al., 2020; Demant et al., 2019; Moyle et al., 2019; Oksanen et al., 2021; van der Sanden et al., 2021; van der Sanden et al., 2022b). The current research focus on drug transactions likely provides only a partial picture of how people navigate social media for drug trading.

Communications researchers have long suggested that different communications technologies fulfil different social functions (Baym et al., 2004). In the context of social media, different platforms enable distinct social functions by virtue of their unique features, design and functionalities (Phua et al., 2017; Waterloo et al., 2018). For example, Facebook has been widely linked to social networking (e.g., Ellison et al., 2007), Instagram to self-presentation (Alhabash & Ma, 2017), Snapchat to spontaneous interactions with close friends (Bayer et al., 2016), and WhatsApp to regular, more personal communication with friends and family (Matassi et al., 2019; Swart et al., 2018). Indeed, research has shown that different platforms tend to meet different social needs and are associated with different relational contexts, ranging from distant, ‘weak ties’, strangers, to more intimate circles of close friends (Karapanos et al., 2016; Phua et al., 2017; Quan-Haase & Young, 2010; Vaterlaus et al., 2016). Increasingly platform diversity is paralleled by overlapping platform functionalities. As a result, people need to make ‘choices’¹⁴ around which platforms they will use for which purposes, given they are presented with many different options hosting similar features (Boczkowski et al., 2018; Madianou & Miller, 2012b; Tandoc Jr et al., 2019).

Several communications theories consider how people ‘choose’ between different social media platforms on an individual basis. For example, uses and gratifications theory (U&G) suggests that people play an active role in deciding how to use different media by selecting platforms that meet specific needs – or gratifications (Alencar et al., 2019; Gruzd et al., 2018; Quan-Haase & Young, 2010). Alternatively, the concept of affordances suggests that platform functionalities

¹⁴ We use the term ‘choice’ in scare quotes throughout this paper to account for the extent to which individual preferences and risk perceptions are likely to influence which platforms are used for drug transactions. However, we acknowledge that individuals do not always make explicit ‘choices’ to use specific social media platforms. Additionally, people may gradually ‘drift’ into involvement in drug selling rather than actively ‘choosing’ to commence these behaviors.

constrain their possibilities of use, thereby pushing people to use them to perform specific actions (Davis & Chouinard, 2017; Evans, Pearce, et al., 2017; Hutchby, 2001). However, many people use different platforms as vehicles for their social relationships (Madianou & Miller, 2012a). The social context surrounding the use of different platforms can have a powerful influence on how people 'choose' between them and how different features are prioritised. Drug markets have long been suggested by researchers to be comprised largely of different social relations (e.g., Dwyer & Moore, 2010). As such, the process of 'choosing' a platform for drug trading may need to be navigated as part of the relational context in which drug transactions take place.

In this vein, polymedia theory suggests that diversity and convergence (Jenkins, 2006) in the social media landscape leads people to structure their platform use around distinct social and relational contexts rather than on platform functionality alone (Madianou, 2014, 2016; Madianou & Miller, 2012a, 2012b). In an environment characterized by widespread media literacy, and easy access to diverse communication mediums at low-cost, people tend to perceive media as one complete environment of affordances they can use to manage different relationships (Madianou & Miller, 2012a, 2012b). Polymedia draws on affordance theory (Hutchby, 2001), arguing that platform functionalities and features provide the means through which people compare and distinguish between them, making decisions around which platform is appropriate in a particular social context or relationship. The process of 'choosing' an appropriate medium is twofold. Firstly, the affordances of the medium must suit the communicative needs of the relationship, and secondly, the platform itself sends an 'appropriate' message about the *nature* of that relationship (Madianou, 2016; Peng, 2016). According to polymedia, platform 'choice' is a two-way street, where one person's 'choice' of platform may not be accepted as "appropriate" for the social context at hand by their interaction partner, or social group (See also, Gershon, 2010a). As such, power dynamics between interaction partners will tend to influence how different mediums are used within the context of a particular relationship. A factor which can lead to tensions between different platform preferences (Madianou & Miller, 2012a).

The negotiation of power as part of platform 'choice' in polymedia contexts may constrain the ways in which people are able to manage their relationships using 'choice' of platform. Within the context of this study, we argue that using social media for drug trading means that buyers and sellers must position drug trading behaviours within their personal and local polymedia environments. In particular, we consider how social pressure to use platforms that are dominant or the social media 'default' within one's country, region, city or social group (Ling, 2017) may impact on the ways in which people are able to enforce their 'choice' of platform for drug trading. Messaging apps such as WhatsApp in much of Europe, Latin America and Africa, or Messenger in

the US, Canada, Australia and New Zealand (We Are Social & Hootsuite, 2022; Winik, 2021) are deeply embedded in everyday life to the point where their use is 'taken for granted' (Ling, 2012; Matassi et al., 2019). Ling (2016) describes the social pressure to make use of communications technologies such as the mobile phone and texting as 'soft coercion' (See also, Ling & Lai, 2016), whereby individuals risk social consequences such as exclusion if they 'choose' to inconvenience others by not being accessible via commonly used social media channels. Hence, individuals may make 'choices' around which platforms they use, and what they use them for, but these 'choices' remain constrained by the wider environment of local and group norms around social media use (Ling, 2017).

This paper applies polymedia theory to understand social media drug markets, exploring how people who buy or sell drugs via social media in New Zealand make 'choices' around the platforms they use for drug trading.

Social media drug markets and relationship between buyer and seller

A range of different social media platforms have been linked to drug trading, ranging from 'mainstream' platforms such as Facebook, Instagram, Snapchat and WhatsApp (Bakken, 2020; Bakken & Demant, 2019; Demant et al., 2019; Moyle et al., 2019) to lesser-known platforms such as Discord (van der Sanden et al., 2022b) and encrypted messaging apps such as Telegram (Barratt et al., 2021; Blankers et al., 2021).

Different social media platforms tend to facilitate different drug market structures based on how they facilitate access to new buyers and sellers or protect traders from exposure to law enforcement and prosecution (Bakken & Demant, 2019). Platforms that enable social networking between strangers, such as Tinder, Grindr, Instagram, Facebook and Discord, allow sellers to openly 'advertise' their products to unknown buyers by constructing a public profile, or advertising to other members of Facebook drug selling groups (Bakken, 2020) or Discord drug servers (van der Sanden et al., 2022b). This type of drug market dynamic has been described as 'open' or 'public' by drug researchers (e.g., Hough & Natarajan, 2000; Sandberg, 2012), indicating drug markets that are highly visible and accessible, offering sellers little security from law enforcement. Drug transactions in 'open' drug markets tend to take place between strangers (Eck, 1995; May & Hough, 2004). Conversely, messaging platforms, both encrypted and unencrypted, facilitate more private drug transactions between people who likely already know one another, via direct message or within the confines of a group chat (Bakken & Demant, 2019). Drug researchers describe this type of drug market as 'closed' (e.g., Hough & Natarajan, 2000), with drug

transactions taking place in a discreet location, and sellers only transacting with trusted buyers, or vice versa (May & Hough, 2004).

Though there has been some contextualization of the use of messaging platforms to facilitate trades between people who already know one another (Bakken & Demant, 2019; Demant et al., 2019), the majority of current findings apply to commercial drug markets involving transactional buyer/seller relationships with a high level of profit motive for sellers. Indeed, Moeller (2022) has suggested social media drug markets may be more market-driven than network-driven. As a result, there remains considerable scope to consider how social media may be facilitating less commercial drug trades (e.g., between friends, or within social networks). For example, 'social supply' behaviours are also increasingly likely to be channelled through social media platforms. Social supply refers to small-scale drug selling carried out between friends or social contacts, often with the intention to recoup the costs of the seller's own drug consumption or to earn a modest profit (e.g., Coomber & Moyle, 2014; Potter, 2009). The role of social networks in social supply contexts often mediates individual perceptions of what counts as 'dealing' drugs, facilitating a gradual shift – a 'drift' – from drug consumption into drug selling behaviours (Bright & Sutherland, 2017; Goldsmith & Brewer, 2015; Jacinto et al., 2008a; Taylor & Potter, 2013). However, researchers are yet to examine how social supply behaviours are facilitated via social media.

These differing types of drug selling are not mutually exclusive on social media. Sellers may move between different platforms at different points during a transaction or commercial relationship (Bakken & Demant, 2019). For example, a seller may advertise to new buyers on Instagram, but direct them to an encrypted messaging app such as Wickr to arrange a transaction. Prior research on social media drug markets has argued that this environment presents sellers with considerable control over how they are approached by buyers, effectively allowing them to 'choose' and combine different platform features based on their own needs for accessibility or security (Bakken & Demant, 2019). However, focusing exclusively on seller risk perceptions and security needs as the principal drivers of platform 'choice' in social media drug markets may overlook the broader ways in which people structure their relationships on social media (Madianou & Miller, 2012a).

Social media use and social media drug trading in New Zealand

Rates of social media use in New Zealand are high, with just over 89% of the population making use of social media as of January 2022, compared to 81% in the US and 33% in India (We Are Social

& Hootsuite, 2022). As of February 2022, 81% of New Zealanders with internet access use Facebook, making it New Zealand's most popular social media platform, followed by Facebook Messenger (75%), Instagram (58%), WhatsApp (40%) and Snapchat (37%) (We Are Social & Kepios, 2022). A recent online survey of New Zealanders who use drugs found 22% of respondents had purchased drugs via social media in the past six months, of which 60% had done so via Facebook/Messenger, followed by 48% via Snapchat and 20% via Instagram (van der Sanden et al., 2021). Encrypted messaging apps were less widely used among respondents, with only 9% having used Wickr and 2% having used Telegram. The cited advantages of using social media to buy drugs were greater convenience (74%), faster transaction speed or delivery (43%) and ease of use in comparison to the dark web (41%) when purchasing drugs in this way (Moyle et al., 2019; van der Sanden et al., 2021).

The aim of this paper is to explore how the process of 'choosing' a platform for drug trading in *social supply settings* may differ from more commercial market contexts and whether this reflects factors which also shape people's day-to-day engagement with social media.

Methods

This paper presents data gathered from anonymous qualitative online interviews with people who have experiences using social media to buy and/or sell drugs, as part of a broader project examining social media drug markets in New Zealand (See also, van der Sanden et al., 2021; van der Sanden et al., 2022b). Online chat interviews (Bakken, 2022; Barratt, 2012; Gibson, 2022) with 33 participants were carried out from July 2020 to September 2021. A semi-structured interview approach was chosen to facilitate adaptability across a wide range of different drug market roles (i.e., buyer/seller) and patterns of social media platform use, and to allow for greater flexibility in responding to novel issues and experiences raised by participants (Brinkmann & Kvale, 2015). The initial interview schedule was developed based on a comprehensive literature review and the results of an earlier large-scale quantitative survey of people who purchase drugs via social media in New Zealand (van der Sanden et al., 2021). The interview schedule included topics such as how and why participants used specific platforms to purchase or sell drugs, perspectives on physical safety and drug quality when using social media drug markets, and patterns of social media use more generally.

Given the nature of the research topic, the potential difficulty of recruiting participants from a hard-to-reach population, and to encourage open disclosure by interviewees, interviews were carried out via the anonymous encrypted chat app Wickr me (referred to as Wickr

throughout this paper) (Mayr & Weller, 2016; Stieger & Göritz, 2006). It was assumed participants would feel safer, and more comfortable sharing their experiences anonymously via direct messaging (Barratt, 2012; Kazmer & Xie, 2008). Additionally, we anticipated that many interviewees would likely be younger in age (e.g., <25) and for many in this age group communication via messaging is often perceived as more 'relaxed' than in-person conversation or phone-calls with strangers (Bakken, 2022; Gibson, 2022). Wickr was chosen due to its security features. The app offers users end-to-end encrypted messaging, does not require users to enter a phone number to sign up, and message-timers are automatically applied to messages ensuring chat content is deleted after a short period of time. Wickr has been used in previous research with social media drug sellers internationally (Demant et al., 2019), as well as by surface web cannabis sellers and buyers (Childs et al., 2022).

Participants were recruited using a targeted sampling approach (Watters & Biernacki, 1989) via multiple online social media channels and through distributing fliers physically at a dance music festival. The study was advertised on both reddit and Facebook. The lead researcher approached the administrators of subreddits specific to New Zealand and Facebook groups related to drugs such as cannabis or psychedelics, as well as dance music genres often associated with specific types of drug use (Forsyth et al., 1997) for permission to post the study advert. Hard copy adverts for the study were also physically distributed at a dance music festival in Auckland, and the advert was posted to various social media channels (Facebook, Instagram and Twitter) via the New Zealand drug checking service *Know Your Stuff*. Prospective participants needed to be aged over 16 to participate in the study and have some experience using social media to buy and/or sell illegal drugs in New Zealand.

Interviews were completed online over several hours, or in some cases over several days (due to breaks between ongoing messages), with the longest interview duration being five days (See also, Bakken, 2022). The interviewer used Wickr's desktop application to both carry out the interviews and to transcribe them by copy-pasting chat messages directly into a word document and formatting them effectively immediately to remove participant usernames or identifying details. Participants were offered a supermarket voucher as reimbursement for their time. In total, 33 people were interviewed for this project, 11 of whom also took part in a follow-up interview (also via Wickr) approximately six months after their initial interview. Follow-up interviews were carried out to further develop the research team's understanding of social media drug markets by providing an opportunity to clarify interpretations of existing data, as well as ask questions on topics that had emerged from interviews with other participants in the meantime. Additionally, in the period between initial and follow up interviews, some interviewees changed their patterns of

social media drug trading by either changing their market roles or switching to use alternative platforms. These changes provided valuable examples of platform ‘choice’, which helped inform data analysis.

Data were analysed thematically in NVivo using Braun and Clarke’s Six-Step Thematic Analysis framework (Braun & Clarke, 2006, 2014, 2022). Initial coding structures were developed based on a comprehensive literature review and findings generated from online interviews. As data collection and analysis progressed, coding structures were further developed and refined. Initial analysis involved reading, and coding interviews by hand based on descriptive data such as app types used for drugs, drug supply connections and seller types, perceived risk and negative experiences, as well as topics such as online privacy and references to recreational drug use, drug quality and price. Memos were maintained for each ‘code group’, detailing developments in thinking and noting those interviewee experiences that were particularly important to the essence of the codes within the group. Concept- and mind maps were used to clarify relationships between codes, code groups and themes in preparation for the write-up of findings. The research team has opted to retain original language used by participants in the interview excerpts presented below. In cases where slang terms are clarified, this is inserted into the excerpt in non-italicized parentheses.

This research received ethics approval from Massey University Human Ethics Committee Southern A (application code: SOA 20/22).

Findings

Contextualization of interview sample

The majority of participants had used social media to buy drugs (n=20), while the remainder (n=13) had both bought and sold drugs to differing extents. The median age of the sample was 24 (IQR=19.5-26), with the youngest interviewee aged 16 and the oldest 39 years. Ten interviewees identified as female, 22 male, and one gender neutral. Twenty-three participants were located in New Zealand’s North Island (By region: 10=Auckland – New Zealand’s largest city and most populous region; 10=Wellington – New Zealand’s capital and third largest city), and ten in the South Island (By region: 5=Otago, 3=Canterbury, 2=Southland).

Table 1 presents the platforms used by participants for buying and/or selling drugs, and for non-drug related purposes. Messenger (n=19) and Snapchat (n=17) were most often used for drug

trading by participants, followed by Wickr (n=16), and Discord (n=12). The median number of platforms used for drug trading purposes among participants was 2, with the fewest being 1 and the most being 5 different platforms. Messenger (n=29), Instagram (n=28) and Facebook (n=27) were most often used for non-drug related purposes (see supplementary material for detailed breakdown of interviewee drug and non-drug related platform use; Appendix L in thesis).

Table 9: Aggregate numbers for platforms used by participants to buy/sell drugs, and platforms they used for 'everyday', non-drug related purposes. Platforms are ordered based on the frequency with which participants used them to buy/sell drugs.

Platform	Number of participants who used this platform to buy and/or sell drugs (N=33)	Number of participants who used platform for non-drug related purposes (N=33) (e.g., keeping in touch with friends and family, news, dating, etc.)
Facebook Messenger	17	31
Snapchat	17	22
Wickr	16	0
Discord	12	18
Instagram*	5	28
Signal	5	2
Telegram	4	3
Facebook**	3	27
Reddit	2	13
Kik	1	0
Tumblr	1	3
WhatsApp	1	8
Tinder/Grindr	1	3
Twitter	0	3
TikTok	0	1
Median number of platforms used = 2 (range 1-5)		

* The five participants who used Instagram for drug trading all used Instagram Messenger to buy drugs from friends or social connections.

** Participants who purchased drugs from the Facebook platform used either selling groups or seller Facebook pages. These participants are also included in the aggregate number under the use of Facebook Messenger for drug trading as they all used Messenger as part of their engagement with either the selling groups or seller pages.

Factors influencing app 'choice' among buyers and sellers

From a polymedia perspective, comparisons between platform affordances, or features underpin the linking of platform to social context (Madianou & Miller, 2012b). In the context of our interview sample participants differentiated between platforms based on two dimensions: security and convenience. Figure 16 presents the different platforms based on interviewees perceptions of these two dimensions, that is, their understanding of the effectiveness of the security features of platforms, and the perceived convenience of using the platform (which may reflect the platforms proximity or place within interviewee's 'everyday' social media repertoires). The relative positioning of the platforms is discussed in detail in the sections below.

1. Security

Platform security concerned whether the platform in question had in-built features such as self-deleting data or messages, and end-to-end encryption that participants could make use for drug trading. Participants tended to rank platform security in terms of how many security features they *thought* a particular platform had, which then provided a baseline indication of what type of drug market context warranted the use of that platform (Madianou & Miller, 2012a). For example, an encrypted messaging app such as Wickr was considered 'very high security' because it incorporated three security features: end-to-end encryption, message-timers, and username-based sign up, thus avoiding the need to link one's account to a phone number (see Figure 16). The messaging apps Signal and Telegram were also perceived as high security, but both platforms require sign up with a phone number, which some participants felt was less secure. Telegram chats are also not end-to-end encrypted by default – a feature which only one interviewee was aware of. Snapchat offered users 'some security' by virtue of username-based sign up and self-deleting messages, while Discord offered users pseudonymity but no other platform security features. Messenger offered users 'no security' (unless using the 'secret chats' feature) because messages had to be manually deleted, were not end-to-end-encrypted and use of the platform was linked to an individual's offline identity.

As a result, participants often used different platforms to meet the security needs of different buying and selling contexts. Transaction risks such as drug type, the amount bought or

sold, and the level of drug market involvement of one or both parties often encouraged the use of platforms with multiple security features:

*My friend and I were importing a lot of stuff so *we* communicated via wickr and sort of sold to close friends who then delegated out? (P12, Gender neutral, 25, seller)*

Not all my dealers use wickr only the ones that supply A class (drugs). And B class too. But Facebook or Snapchat will work just fine for those things too. (P8, M23, buyer/seller)

2. Convenience

Conversely, the extent to which a given platform was viewed as ‘convenient’ for drug trading reflected its wider use in the population and in interviewees’ social networks:

I didn’t exactly start looking on social media, it was more just there. It’s what everyone uses. Wickr was the only app I downloaded specifically for drug purchasing (P3, M21, buyer/seller)

This excerpt underscores what was a common point of contrast between more general ‘social media’ (i.e., Facebook, Messenger, Instagram, WhatsApp, and Snapchat) and encrypted messaging apps. Social media platforms were already an integral part of interviewees’ daily lives (Ling, 2012; Matassi et al., 2019), while encrypted messaging apps were often not familiar to interviewees and needed to be downloaded specifically for buying and selling drugs. As shown in Table 9, while some interviewees did make use of Telegram and Signal to chat with friends or for other non-drug related purposes, Wickr was exclusively linked to drug trading. Additionally, Telegram and Signal have increased in popularity in recent years (O’Flaherty, 2021; Statista, 2022) and at the time of writing are more regularly downloaded from the New Zealand Apple App Store than Wickr (Similarweb, 2023a).

3. Trade-offs between security and convenience

The previous sections show how participants tended to contrast platforms both *within* parameters of security and convenience, but they also weighted these variables against one another. Taken together, a platform which was ‘high security’ – such as an encrypted messaging app – was then almost always ‘low convenience’, while ‘high convenience’ platforms, such as Messenger were by and large viewed as ‘low security’ (Figure 16). How security and convenience were weighted among interviewees tended

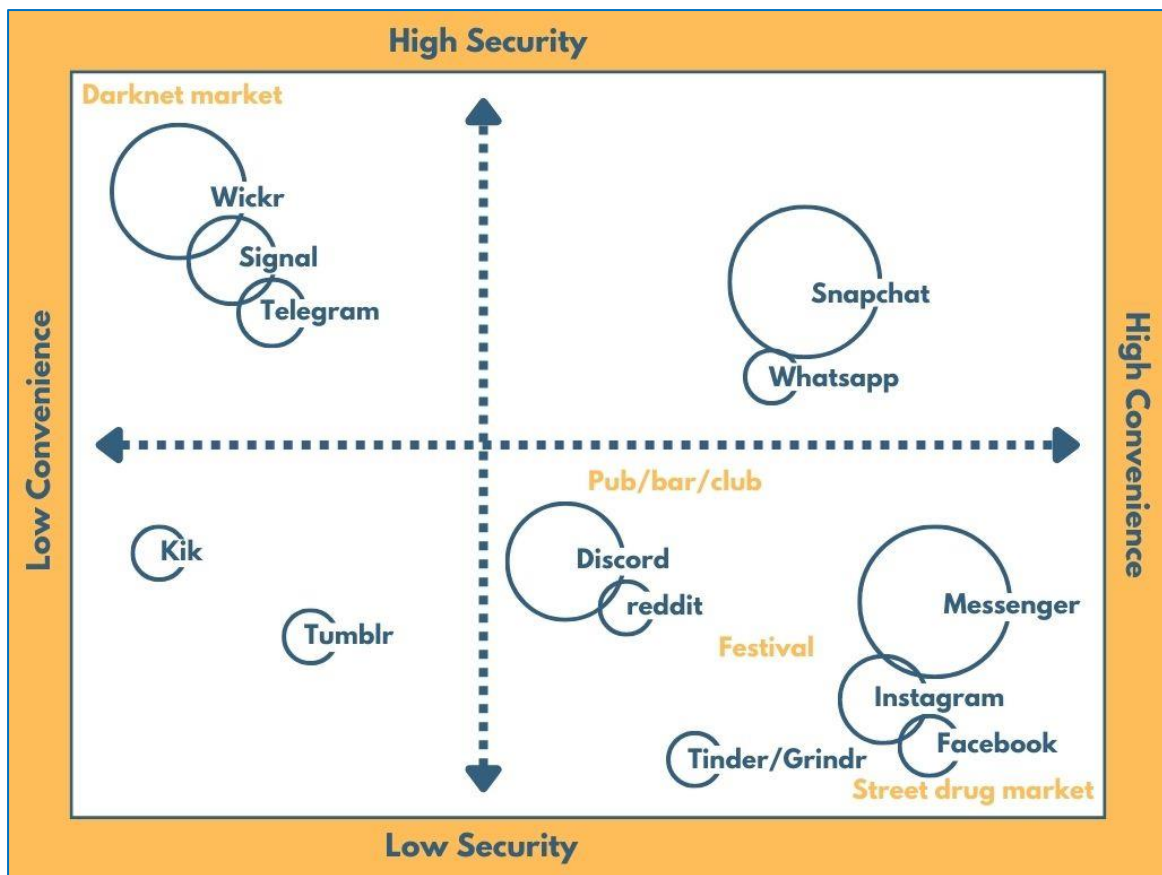


Figure 16: Platforms used for drug trading (Table 9) positioned based on participant perceptions of their level of security (how many security features a platform is viewed as having) and their level of convenience (rates of platform use among participant social networks, familiarity with the platform, perceptions of technical complexity). The larger the circle linked to each platform, the more participants used the platform for drug trading. Approximate positions of other types of retail drug market have been included for comparison.

to depend on their relationship to the buyer or seller, and their own market role. For example, some sellers and buyers – particularly those who were younger and involved in trading smaller amounts of drugs such as cannabis – indicated they saw the low convenience of encrypted apps, and their more ‘niche’ place in the social media ecosystem, as barriers to adopting them for drug trading purposes:

Fuck all people use wickr hahaha. Everyone has snapchat (P29, M19, buyer/seller)

I feel safer on Snapchat funnily enough because I use the app more often. I don't fully understand wickr (P28, F22, buyer)

In line with these examples, some participants referenced Snapchat as a useful ‘middle ground’ that balanced the convenience of Messenger with a level of security that was “sufficient” for most small-scale drug trades:

(Snapchat) is pretty much perfect... It's more anonymous than texting, and everyone already has an account so you only need to add a dealer instead of if you used something like Wickr, where you have to make a whole new account (P22, M16, Buyer)

Commercial drug markets: Facebook, Discord and Encrypted messaging apps

The more commercial drug market environments tended to be characterized by a lower degree of familiarity between buyer and seller, often making platform 'choice' more streamlined for both parties. However, the way streamlining effect took shape was largely dependent on whether the social media drug market in question was 'open' or 'closed' (May & Hough, 2004).

1. Selling groups

Interviewees taking part in more 'open' selling groups on Facebook (or Messenger), and on 'lower tier' Discord drug servers (van der Sanden et al., 2022b) tended to place emphasis on the overall convenience of these drug trading environments. This type of social media drug market offered interviewees access to a range of products, sellers, and buyers, and often included quick local drop off or delivery (Moyle et al., 2019). The predominance of drug trading between strangers in this context appeared to elevate the importance of platform convenience as a means of facilitating connections between people who were otherwise not socially linked. In this case, platform 'choice' was made by buyers *and* sellers *independently* prior to connecting with one another via a selling group. As a result, the process of initial platform 'choice' in selling group environments was more reflective of individual media 'choice' theories such as U&G (Quan-Haase & Young, 2010). Interviewees tended to contrast their use of selling groups against their use of other platforms linked more closely to drug access via network ties, as illustrated in the quote below:

P29: *Discord is more of a failsafe if no one is buying. Since there's so many people on the servers there's always someone who wants to buy*

Interviewer: *So it's like options and loads of buyers on Discord versus security and safety on Snapchat?*

P29: *Yeah exactly. That made it sound smart (M19, buyer/seller)*

In this case, the interviewee used both Snapchat and Discord drug servers to sell drugs, but he contrasted between them as each meeting different selling needs or having different gratifications – in line with U&G theory (Quan-Haase & Young, 2010). However, the concentration of selling

groups on low security platforms in our sample (see Figure 16) could also be viewed as negating platform ‘choice’, by pushing buyers and sellers to “follow the market” (Moeller, 2022), irrespective of individual platform preferences. Hence, though interviewees were free to ‘choose’ whether they used Facebook, Messenger or Discord to access selling groups along individual parameters, they had little control over the platform the group was based on (Ling, 2017).

2. Encrypted messaging apps

In our sample the use of an encrypted app tended to underscore a shift from social supply to participation in a more commercial drug market. Interviewees almost always moved to using encrypted messaging apps after getting a seller’s contact details from a friend, who acted as a trusted go-between through which the seller could vet the prospective buyer and vice versa (See also, Bakken & Demant, 2019). This existing network link between buyer and seller often meant that the use of encrypted messaging apps was typically associated with more distant ‘weak tie’ social contexts (Haythornthwaite, 2005), and the seller was often clearly framed as a ‘dealer’:

Friends offering usernames of dealers they had gotten drugs off. So I got the app and usernames of recommended dealers and used it from there (P17, F26, buyer)

As illustrated in the above excerpt, the seller contact dictated what platform the buyer downloaded for drug trading. Platform ‘choice’ was dominated by seller preferences, and the use of a high security, low convenience platform such as an encrypted messaging app was respected by buyers, who understood they had to approach sellers via the ‘correct’ communications channel to make purchases:

Most (sellers) will happily talk on their chosen platform about anything. But the ones who like the encrypted apps won’t talk at all on others (P20, M25, buyer/seller)

With my main dealer my only communication is Wickr (P4, F23, buyer)

The drug market context associated with encrypted messaging apps, and the fact that their use was often specifically associated with buying or selling drugs meant that for buyers, a particular platform could become *linked* to a specific drug contact, and by default also a specific drug market context:

... if you just want some for a festival you’ll probably just ask a mate - but if you want them more frequently then you’re gonna need to find a reliable dealer and app. (P19, F26, buyer)

The clear boundaries around seller preferences that characterized the experiences of

interviewees using encrypted messaging platforms highlight how platform ‘choice’ is simplified in situations of low familiarity between buying and selling parties. The commercial drug market context can be viewed as “demanding” the use of a high security platform, which few buyers are likely willing to question (Madianou & Miller, 2012b). But perhaps most importantly, buyer and seller also typically lack an existing shared polymedia repertoire given their ‘weak tie’ relationship (Haythornthwaite, 2005; Madianou & Miller, 2012b). The latter factor helps to explain the discrepancy between streamlined platform ‘choice’ in commercial drug market contexts and what could be the challenges to navigating this issue in contexts of social supply.

Social supply: Messenger and Snapchat

Among interviewees the use of platforms like Messenger and Snapchat was most often associated with social supply drug transactions. As the excerpts below illustrate, buying from friends using a platform like Messenger was often not really viewed as “buying drugs off social media”:

I guess I would say that I have bought from friends via Facebook messenger, but I don't really count that as social media because it's just instead of talking irl (in real life) or texting (P13, F24, buyer)

I don't use Facebook to find drugs. I have friends on Facebook that I message via Facebook for certain drugs or if someone isn't replying (P8, M23, buyer/seller)

The primacy of the relationship between buyer and seller in this instance meant the platforms used for drugs weren't so much ‘chosen’ as “taken for granted” (Ling, 2012). Platforms like Messenger were already in use and embedded in interviewees’ everyday communications with their friends, and across their wider social networks. As a result of their social dominance (Ling, 2017; Matassi et al., 2019) these platforms can quickly become channels for drug trading.

Using Messenger was part of what could be extensive existing polymedia repertoires shared between buyer and seller (Madianou & Miller, 2012b). This helps to explain why participants tended to blur together different communications mediums such as texting, messaging and even talking when referencing buying from or selling to friends (Baym, 2015):

Social media Vs txt for me is kind of just the same medium really, message to my phone (P11, M32, buyer)

The small-scale nature of most social supply transactions (Coomber & Turnbull, 2007), and high levels of normalization around recreational drug use are important factors underpinning

perceptions of social supply as 'low risk' (Coomber et al., 2016). A low-risk drug market context coupled with the reciprocity characteristic of friendship contexts in general meant that if sellers wanted to use a more secure platform, their preferences had to compete more strongly with high convenience, social 'default' platforms already in use within their social circles:

I would've much rather used an app that offers end to end encryption whilst I was selling but no one wants to download another app (P32, M19, buyer/seller)

In this context, shifting friends onto encrypted messaging apps specifically for drug trades could be more difficult given their low convenience and association with more 'serious' drug market contexts. As such, sellers could adopt a 'middle ground' platform that balanced security with convenience, such as Snapchat:

Just that it's asking people to add an extra app that they wouldn't otherwise use, friends would just think it's a bit paranoid/too annoying to ask for a small amount of drugs... Snapchat is pretty safe as the messages aren't saved. So, I don't think it's worth being a pain to use Wickr (P27, M23, seller)

The above excerpt illustrates how navigating platform 'choice' in social supply contexts could mean navigating tensions between seller security needs and buyer desires for convenience. Making use of more accessible 'mainstream' platforms for drugs was not, per se, experienced as problematic among interviewees who sold to friends, and buyers and sellers often used 'code' to talk about drugs on platform such as Messenger (See also, Bakken & Demant, 2019; Demant et al., 2019). However, it highlights an element of vulnerability sellers might need to navigate as part of their involvement in social supply, where they could be at greater risk of exposure to police, if buyers approached them via the 'wrong' social media channels (Gershon, 2010a):

I do worry about privacy and security, especially as I fairly often get friends asking about things on clear text messenger, though I always reply in the secret chat. (P9, M29, buyer/seller)

Movement between apps for buying and selling drugs

The linking of different platforms with different drug market contexts helps to explain why using multiple platforms for drug trading was commonplace among interviewees (see Table 9). Many interviewees combined the use of a more 'serious', high security encrypted messaging app for commercial transactions with 'everyday' social media channels in the context of social supply. In

this manner, interviewees effectively used different social media and messaging platforms to manage their drug market relationships akin to polymedia theory (Madianou & Miller, 2012a):

Dealers I tend to have on Wickr but I use messenger and Snapchat as well especially if it's close friends (P4, F23, buyer)

Some sellers highlighted a similar pattern, where encrypted messaging apps were used in contexts of higher transaction risk, or vis a vis another seller or grower, while buyers could use a variety of more convenient channels to get in touch:

Well just which ever platform they speak to me first is how I leave it. Unless it's text or calling I tell them to add me on snap. Telegram for the grower because it's higher risk and I would be picking up 10-15-20ozs (of cannabis) at a time so extra caution is used (P24, M31, buyer/seller)

However, individual polymedia repertoires and the place of drug trading within them were variable (Madianou & Miller, 2012a). Seller preferences for greater security, and buyer preferences for greater convenience were not set in stone. For example, some buyers discussed drugs strictly on encrypted messaging platforms, even with their friends:

If someone messages me about drugs on FB (Facebook) or IG (Instagram) I immediately tell them to message me on Wickr. Sometimes people message me like "do you have x" and I'll say go to Wickr. I never message anyone about stuff outside of Wickr. But occasionally people will message me and I'll direct them here (P19, F26, buyer)

Some idiots try talk to me on messenger but I'll tell them to download wickr. I've gotten most of my mates who talk drugs onto it (P25, M27, buyer)

In the above cases individual risk perceptions and platform security are viewed as more important than group norms around communication via social media channels (Ling & Lai, 2016). These examples highlight how group norms around social media use – even those involving socially embedded platforms like Messenger can be modified to accommodate specific behaviours such as drug trading.

Lastly, as part of managing their engagement with different drug market contexts on social media, some interviewees appeared to actively avoid downloading or using platforms associated with more 'serious' or 'risky' drug market settings. In these instances, buyers appeared to understand that certain platforms were associated with certain types of sellers and used this

knowledge to shape their own interactions with their local drug market:

To be honest if I didn't have those contacts (on Messenger) I would have probably still used drugs but I would have asked someone else to source instead of me going to download wickr etc and source. You always know someone who knows someone who will be able to source (P16, F26, buyer)

The interviewee in the above excerpt expresses an understanding of Wickr as associated with less familiar, more commercial and 'high stakes' drug purchasing. For this reason she made a point of sticking to Messenger for drug purchasing. Commercial sellers were most likely unwilling to use Messenger, but she could easily contact friends and acquaintances using this platform. This meant she was able to continue buying from social connections and could avoid having to engage with what she considered a "dodgier" part of her local drug market.

Discussion

Previous research suggests that social media affords drug sellers a greater level of control over how they interact with their local drug market, allowing them to locate themselves on a platform of their 'choice' (Bakken & Demant, 2019; Demant & Bakken, 2019). Bakken and Demant (2019) argue this may mean social media drug markets are less heavily influenced by buyer demands and preferences, as buyers are required to meet a seller in their 'chosen' location. While our findings confirm this can be the case, we suggest this type of platform 'choice' process tends to be characteristic of more commercial impersonal seller/buyer relationships and drug market contexts. Additionally, the importance of buyer preferences – in the form of greater platform convenience – tends to increase in contexts where there is an established personal relationship with the seller. In contexts of social supply, it may be the seller who meets the buyer on *their* terms. As such, this paper provides an important contextualisation of how social supply behaviours are channelled through social media and messaging apps.

Social media and encrypted messaging apps are increasingly seen as more convenient, faster, and user-friendly local alternatives to purchasing drugs compared to the complexity and volatility of darknet drug markets (EMCDDA, 2019; Groshkova et al., 2022). However, these social media platforms and encrypted messaging apps are not purposely designed to facilitate drug trading. This distinguishes ad hoc social media drug markets from specifically designed darknet markets (Aldridge & Décary-Héту, 2014), online pharmacies (Scammell & Bo, 2016), and other surface web drug purchasing websites (Childs et al., 2022). As such, it is important to consider how

preconceived perceptions of different platforms and established patterns of social media engagement may influence how people adapt this technology for drug trading. Researchers have highlighted the importance of platform popularity and familiarity to the overall convenience of accessing drugs via social media (Bakken & Demant, 2019; Moyle et al., 2019). However, our findings highlight that platform popularity is one element of a broader set of local and culturally distinct patterns of social media engagement and distinctions between platforms, which people may use to structure their use of social media for drug trading.

In a polymedia environment the process of negotiating 'choice' of platform "*often becomes the message itself*" (Madianou & Miller, 2012b, pp. 172-173). This statement underscores the contrast between navigating platform 'choice' in more commercial drug market settings compared to social supply contexts. The *lack* of negotiation around platform 'choice' in commercial settings and sellers' ability to prioritise platform security features over considerations of convenience is contrasted with what can be considerable complexities of balancing these factors between friends within social networks.

From a drug market perspective, low transaction risks and the normalization of recreational drug use (Coomber et al., 2016; Potter, 2009) are likely to influence how important or explicit the consideration of platform 'choice' is to sellers in this setting. Researchers argue that many people "drift" into social supply behaviours as part of recreational drug use (Taylor & Potter, 2013). As such, contemporary social supply is likely to entail a "drift" into using "taken for granted" messaging apps (Ling, 2012) to organise trades, limiting any explicit platform 'choice' on the part of the seller. How buyers approach social suppliers will in large part depend on the platforms they are already connected on. As a result, the social media environment presents buyers and sellers in social supply contexts with the challenge of navigating how drug trading should be positioned within existing polymedia repertoires already established as part of their relationship or social group (Madianou & Miller, 2012b). This contrasts with the more 'traditional' use of the mobile phone in drug markets and sourcing between friends, where organising a drug transaction is a matter of 'choosing' whether to call or send a text (Moore, 2006; Sjøgaard et al., 2019). In social supply contexts a balance may need to be struck between providing the seller with some security, whilst also limiting inconvenience for the buyer.

Additionally, the inclusion of "taken for granted" platforms like Messenger as part of existing polymedia repertoires in social supply contexts carries considerable weight in shaping how hard sellers may need to work to move buyers to more secure platforms for drug trading. The pressure to be available via Messenger in New Zealand, particularly in relation to one's social

group is considerable (Ling, 2017; Ling & Lai, 2016). In a friendship context, shifting away from the dominant 'default' messaging platform such as Messenger means inconveniencing your friends and social group (Ling, 2017). Messenger becomes a bulwark which can make it particularly difficult for sellers to make use of 'high security' messaging options like Wickr. As such, sellers in social supply contexts could face 'soft coercion' to locate themselves on platforms already in use among their social groups (Ling, 2016, 2017), which could constrain their ability to navigate their local polymedia environments for drug selling purposes (Madianou & Miller, 2012b).

Our findings also offer contextualization of how encrypted messaging apps are used by buyers and sellers in smaller, local retail-level drug markets. Existing research has highlighted the popularity of encrypted messaging apps among darknet vendors for purposes of 'direct dealing' (Childs et al., 2020). Their use among commercial sellers on social media and other surface web drug markets has been documented (e.g., Blankers et al., 2021; Childs et al., 2022). However, our interviewees often separated their use of these platforms for drugs from their use of more mainstream social media channels. Though encrypted messaging apps are increasing in popularity, public perceptions of end-to-end encryption and secure messaging platforms like Signal or Telegram as catering to 'people with something to hide' remain influential (Akgul et al., 2021; Belair-Gagnon et al., 2018; Gaw et al., 2006). These perceptions impact on how these platforms are adopted for drug trading and help to justify their use in commercial drug market contexts, while elevating barriers to adopting them for drug trades between friends. Indeed, for many interviewees, encrypted apps appeared to signal the boundaries between social supply and their local commercial drug market.

From this perspective, the popularity of low security, high convenience social media platforms such as Snapchat or Messenger for drug trading, particularly among young people, may reflect some resistance to entering more commercial drug market structures, which researchers have suggested is a key function of social supply behaviours (Coomber & Turnbull, 2007). Researchers highlight that social media may make commercial drug markets more accessible to young people (Demant & Bakken, 2019; Moyle et al., 2019; van der Sanden et al., 2021). Though this is likely one impact of social media drug trading, it may be that using different social media and messaging platforms presents young people with a pathway through which they can manage their own engagement with and exposure to their local drug markets. Indeed, our findings show that 'choosing' to use or not use a particular platform for drug trading is one way this can be achieved.

It is notable that ten of our sample identified as female (n=10, N=33) particularly as research samples of people who use and buy drugs are often overwhelmingly male. Studies have shown gender is a factor in drug use patterns (e.g., Van Havere et al., 2009), as well as people's experiences of buying and selling drugs (e.g., Denton & O'Malley, 1999). Additionally, research has also found gender differences in patterns of social media usage and engagement (e.g., boyd, 2007; Hargittai, 2007). Consequently, a fruitful future direction for researchers could be to examine the role gender plays in shaping how or whether social media is used for drug trading.

Limitations

Our choice of Wickr as the platform for the interviewing of our participants is likely to impact on who we interviewed and our findings. Wickr was the encrypted messaging platform our participants most often reported using, and this may in part reflect the fact that many were already using Wickr (as opposed to having to download it specifically to take part in this research).

Platforms such as Tinder, Grindr, and WhatsApp, which are commonly used in New Zealand and in other parts of the world, both for drug trading and as part of people's daily lives, did not feature heavily in our sample, and future research could explore the issues we have covered among users of these platforms.

Finally, this study contains a large group of buyers, which may influence our findings around platform 'choice'. Some of the information on the scale of seller operations was provided by buyers whose understanding may be based on incomplete knowledge.

Conclusion

Using social media and encrypted messaging platforms for drug trading requires buyers and sellers to make 'choices' about which platforms they will choose to transact on. This paper has explored the ways in which buyers and sellers navigate platform 'choice' in relation to drug trading, highlighting the importance of drug market context in shaping how these 'choices' are made. We found that the nature of the relationship between the buyer and seller mediated perceptions of the importance of platform security and accessibility, influencing judgments around which platforms were either 'appropriate' or 'inappropriate' for use in a particular drug market context. Sellers in more commercial market contexts could exercise considerable 'control' by directing buyers to specific platforms. Conversely, sellers in social supply contexts had to find a balance between their own security needs and established patterns of social media use among their social

networks, often prioritising the use of socially embedded platforms such as Facebook Messenger. Our paper suggests social media drug markets are shaped by many of the same patterns and dynamics that influence the use of social media more generally. Studying social media drug markets requires researchers to look beyond drug market dynamics alone to consider how different social media platforms are perceived and navigated as part of people's daily lives.

Chapter 8: ‘I straight up criminalized myself on Messenger’: Law enforcement, vulnerability and online risk management among people who buy and sell drugs on social media

Chapter 8 examines how interview participants perceived law enforcement risks and how they viewed their privacy and online surveillance on social media. It extends a perspective established as part of Chapter 7, whereby the broader social media context is considered in relation to its implications for drug trading behaviour. In this case, the concept of “imagined surveillance” (Section 3.2.3) is used to analyse participants’ perceptions of law enforcement risk on social media, as well as providing a means of exploring how the more abstract risk of user data collection may be perceived in relation to drug trading. The paper was published in *Drugs: Education, Prevention and Policy* in June 2023.

van der Sanden, R., Wilkins, C., & Rychert, M. (2023). "I straight up criminalized myself on messenger": law enforcement risk management among people who buy and sell drugs on social media. *Drugs: Education, Prevention and Policy*, 0(0), 1-13.

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Abstract

Social media drug markets are likely to present people participating in these spaces with new vulnerabilities to law enforcement. There is currently limited research on how people perceive and manage the risk of exposure to law enforcement in social media drug markets. This is particularly notable considering widespread practices of user data collection and the normalization of surveillance as part of social media engagement. We present a thematic analysis of data from anonymous online interviews with people who buy and sell drugs (N=33) via social media and messaging apps in New Zealand. We use the concept of "imagined surveillance" to explore how participants adapted existing understandings of online surveillance to online risk management strategies to avoid police. Most participants reported low concern for exposure to law enforcement while using social media and messaging apps for drug trading. Nevertheless, almost all participants took active risk management measures. Examples of strategies used included limiting the accumulation of evidence via self-deleting messages or arranging drug trades using code language. Participants often also reported low concern for their digital trace data to be accessed by police. The potential for broader and unexpected consequences to result from the use of drug-related digital trace data across public and private contexts are discussed.

Introduction

Social media and app-facilitated drug markets increasingly provide easily accessible, local pathways to buy and sell illegal drugs (Demant et al., 2019; Moyle et al., 2019). Social media can be defined as online platforms or services which facilitate networked connection, interaction and collaboration between people, groups and organizations through the medium of easily accessed user-generated content (McCay-Peet & Quan-Haase, 2016). This definition can be expanded to include encrypted messaging platforms such as Wickr, Signal, and Telegram, based on their respective platform features.

Existing findings indicate that social media drug markets are likely to be most often used by young people to buy and sell small amounts of drug types like cannabis and MDMA (Oksanen et al., 2021; van der Sanden et al., 2021). As such, a high degree of normalization around recreational drug use, particularly cannabis, has been highlighted as a facilitator of the uptake of social media for drug procurement (Demant & Bakken, 2019), and has been reported in relation to other types of surface web drug-purchasing websites (Childs et al., 2022). As part of perceptions of certain forms of drug use as ‘normal’, and the techniques of “neutralization” (Sykes & Matza, 1957) employed by both buyers and sellers, risk perceptions around the purchasing and supply of drugs may also be lower (Coomber et al., 2016). For example, Childs et al. (2021) found buyers using the website *LeafedOut* to buy cannabis in Australia were largely unworried about law enforcement, based on a belief that police were ‘not interested’ in cannabis offences and due to the small size of most transactions.

Despite evidence that social media drug trades may often be viewed as low risk, there is currently little research exploring how participants in these markets perceive vulnerability to police as part of social media drug trading, and what strategies they employ to prevent detection by police. Both Moyle et al. (2019), and Childs et al., (2022) emphasize the importance of digital trace data ‘trails’, including messages, photos, and additional data sources, to perceptions of law enforcement risk among buyers and sellers. Though Moyle et al. (2019) found that being caught by police because of digital trace data was not a primary concern among respondents, they also found considerable differences in how respondents perceived themselves to be vulnerable to police on social media. Notably, respondents were at times uncertain of whether or how they might be at risk of getting caught, suggesting they “couldn’t be sure they were not being monitored” (Moyle et al., 2019, p. 108). Additionally, a recent paper from Bakken et al. (2022) exploring digital capital in social media drug selling demonstrated that sellers’ digital risk management strategies often involve subjective perceptions of what constitutes digital security

from law enforcement and may draw on factors beyond platform security features. These findings indicate the complexity of understanding and navigating law enforcement risk and digital security as part of social media drug trading. Further investigation of these risk perceptions and related risk management behaviours is important given widespread awareness of social media surveillance by governmental institutions and the challenges of maintaining individual privacy in these spaces (e.g., Acquisti et al., 2015; Lyon, 2018). These broader factors are likely to play a substantial role in influencing how buyers and sellers in social media drug markets perceive law enforcement risk and their resulting risk management behaviours but have yet to be explored by researchers.

This paper contributes to existing understandings of how social media and messaging apps are navigated for drug trading purposes by demonstrating how perceptions of vulnerability to law enforcement and resulting social media risk management practices may be shaped by people's understandings of digital privacy and surveillance more generally. To illustrate this relationship, we explore these perceptions and behaviors in a context of social media drug trading characterized by substantial normalization, and therefore self-expressed low risk perceptions around police. We acknowledge that explorations of law enforcement risk and risk management behaviors are often framed in terms of deterrence (Gibbs, 1975) or restricted deterrence (Moeller et al., 2016) theories. However, in this paper we focus on exploring how broader understandings of visibility, digital trace data sources, and third-party data collection practices influence perceptions and inform strategies used to navigate law enforcement risk as part of social media drug trading. This focus allows us to explore some of the novel challenges that may arise as part of embedding drug trading behaviors into a social media context. In particular, the question of how digital trace data generated as part of social media drug trading may challenge 'traditional' links between being physically caught by police and the disadvantaging and harmful effects associated with having a criminal record (e.g., Uggen et al., 2014).

Background

Data persistence, divergent platform features and "imagined surveillance"

In this paper we consider two interrelated characteristics of the social media environment as important factors in shaping buyers' and sellers' perceptions of and attempts to manage their risk of exposure to law enforcement: data persistence (Mayer-Schönberger, 2011), and 'imagined

audience' (Litt, 2012). Data persistence refers to the potential for online content, such as videos, messages and photos to remain searchable and accessible online overtime (boyd, 2014; Koops, 2011). Many contemporary social media platforms provide the capability to post temporary content (e.g., "stories" on Facebook, Instagram, or send disappearing messages on Snapchat) and most messaging platforms enable the use of message-timers to prevent the accumulation of chat logs over time. Additionally, end-to-end encryption helps to ensure that messages and content which are not automatically deleted are protected from snooping by third parties like the police (Endeley, 2018). These inbuilt features have been identified as important factors underpinning people's preference for social media drug trading (Moyle et al., 2019).

Existing research on social media drug trading highlights the practice of using different platforms for different parts of a drug transaction as a method used by sellers to maintain greater security from law enforcement (Bakken & Demant, 2019). Often this practice involves using multiple platforms to ensure that the most sensitive stage of the transaction is organized on a platform where messages are automatically deleted and/or end-to-end encrypted (Bakken & Demant, 2019; Childs et al., 2021; Demant et al., 2019). End-to-end encrypted messaging services such as Wickr have faced broad scrutiny for 'insulating' drug sellers, among other criminal actors because of platform features which enable temporary, anonymous communication (Christou, 2018; Silva, 2015).

Though social media offer their drug market participants a diversity of security features which can be combined to protect them from police, similar platform features and functions can mask small but important differences across apps (Versus, 2022; Williams, 2022). This terrain makes it more likely that platform users may fail to fully understand how secure a given platform is, particularly concerning features such as end-to-end encryption (e.g., Abu-Salma et al., 2017). Indeed, Moyle et al. (2019) have highlighted that people using social media and messaging apps for drug trading make erroneous assumptions of security based on faulty understanding of platform features. They found this was particularly the case around whether platforms end-to-end encrypted user messages, but also highlighted low awareness around the potential for self-deleting messages or pictures to be stored via third party apps (Moyle et al., 2019).

Despite these security enhancements, perceptions of online data as permanently accessible often continue to guide people's perceptions of their online security and privacy (Kang et al., 2015). While messages or images may be increasingly easy to delete, other stored forms of online data remain available. For example, metadata such as geolocation tags, timestamps on communications and EXIF data on images provide contextual information on users and their

interactions. These can be used to identify and track users' activities with considerable accuracy, in lieu of direct access to messages (Newell & Tennis, 2014; Perez et al., 2018; Sarre, 2017).

Data persistence and the dynamic network nature of social media greatly challenges people's ability to control when, where and how content is circulated, and in turn who can view or access it (boyd, 2014; Litt, 2012; Litt & Hargittai, 2016). Social media data is easily spread beyond its intended recipients, or alternatively online data generated by others can lead to personal information being shared or publicized irrespective of individual action or intent (boyd, 2007; Marwick & boyd, 2014). Indeed, examples of people facing professional, family, political, and legal consequences resulting from the 'leakage' of digital information from one context into another are increasingly common.

As a result, research findings suggest people have become accustomed to managing the potential for continuous surveillance from others on social media (Albrechtslund, 2008; boyd, 2007; Marwick, 2012). Duffy and Chan (2019) introduce the concept of "imagined surveillance" to explain how young people are increasingly taught to assume their social media presence will be scrutinized by others, including family, prospective employers and even the police (See also, Lyon, 2017, 2018). They argue that "imagined surveillance" results from the consideration of two interrelated factors: "imagined audience" and "imagined affordances" (Nagy & Neff, 2015). "Imagined audience" describes people's perceptions of who *could* view their social media presence, or messages and data, both now and in the future. "Imagined affordances" describe how people perceive platform features as either making them vulnerable to, or insulating them from, online surveillance (Duffy & Chan, 2019). Duffy and Chan (2019) suggest that young people actively respond to this continuously shifting potential for online surveillance by using both platform features and social practices to manage the outcomes of "imagined surveillance".

In this paper, we use the concept of "imagined surveillance" to explore how buyers and sellers transacting in social media drug markets perceive and respond to the potential for exposure to law enforcement. In doing so, we consider how people's more general perceptions of risks around digital exposure to others on social media come to inform both their perceptions of vulnerability to law enforcement and subsequent digital risk management behaviors.

Technology: New opportunities and new vulnerabilities for people who buy and sell drugs

The introduction of new digital communication technologies such as the mobile phone, and later the internet and smart phones, into drug selling practices represents both new opportunities to

avoid detection by law enforcement, as well as new vulnerabilities. For example, the mobile phone facilitated greater seller adaptability and flexibility in the face of evolving policing strategies, allowing sellers to easily shift to secure physical locations for exchanges (Barendregt et al., 2006; Fader, 2016; VanNostrand & Tewksbury, 1999). On the other hand, this development also paved the way for the police practices of wiretapping and requesting text and call logs from mobile service providers as a means of gathering evidence (Diffie & Landau, 2010).

Darknet markets (otherwise known as cryptomarkets) also exhibit a similar trade-off between new opportunities for increased anonymity and security, and new vulnerabilities. These spaces facilitate anonymous drug transactions with participants protected by many different online security features such as anonymous accounts, cryptocurrency payment and the marketplace's location on the un-indexed deep web (Aldridge & Décary-Héту, 2016). However, the need to send and receive packages using postal services opens buyers to detection if packages are intercepted, leading to a proliferation of risk management strategies among buyers around 'safely' receiving packages (Aldridge & Askew, 2017). Additionally, the success of several, increasingly sophisticated law enforcement operations and resulting seizure and shutdown of large darknet marketplaces has undermined trust in these sites (Décary-Héту & Giommoni, 2017; Ladegaard, 2020). Similarly, recent seizures of encrypted messages on platforms like SKY ECC (Soudijn et al., 2022), and the ANOM operation (Parkin, 2021) provide indications of evolving law enforcement capacities relating to encrypted communications (Greenberg, 2018).

Law enforcement agencies around the world use social media for a range of investigative and surveillance purposes (Trottier, 2012; Walsh & O'Connor, 2019). Social media companies generally provide channels through which both U.S.-based and international law enforcement agencies can make legal or emergency requests for access to user data (e.g., Discord, 2022; Meta, 2022d; Snapchat, 2020). However, any legal requests must be made via U.S. courts, which can make this process more time-consuming for non-U.S. agencies such as the New Zealand Police. Meta's latest transparency report highlights a steady increase in legal requests for user information made by government agencies from 2013 onwards. Globally, governmental agencies made just under 215,000 requests to Meta for user data on more than 360,000 social media accounts in the last six months of 2021, of which 73% generated some "usable data" (Meta, 2022b). "Usable data" may refer to basic subscriber information such as name, duration of platform membership, email addresses, data on account activity such as IP addresses and stored account content such as messages, photos, and location information. However, as Meta states, they "*produce only the information that is narrowly tailored to respond to each request*" (Meta, 2022a).

Public aspects of people's engagement with social media, such as user profiles and information including their social networks or tagged photos may be accessed by police as part of routine investigations of social media profiles (Egawhary, 2019). The seizure of devices such as phones and laptops as part of many contemporary police investigations, or the requesting of social media credentials and login information as part of cooperation with a police investigation (e.g., Espiner, 2021; Levin, 2021), can generate access to a person's social media presence. This can make it possible to gather significant social media information and data without filing legal requests (Arshad et al., 2019; Egawhary, 2019; Morrison, 2021). Additionally, police may be able to access social media data via third parties, such as data brokers or open-source intelligence platforms (Brayne, 2017). This latter point evidences the potential for social media data to be combined with other forms of digital trace data and accessed by companies and institutions beyond law enforcement (Brayne, 2020; Koops, 2011). These developments underscore the importance of considering the global data trade (Kitchin, 2014) in relation to social media drug trading. It may be that awareness of user data collection practices by social media companies, and the inclusion of these data sources in a broader data trade similarly influences how people understand and manage their digital security in relation to drug trading.

The New Zealand drug market context

Drug use patterns in New Zealand have historically been shaped by the country's small population and geographic isolation (Wilkins et al., 2017). This has meant that imported drug types like MDMA, cocaine and heroin have often been of varying availability, potency, and price compared to locally grown and manufactured drug types like cannabis and methamphetamine (Wilkins, Romeo, et al., 2018). The annual household New Zealand Health Survey (NZHS) estimates that past-year use of cannabis was 15%, MDMA was 4.3%, hallucinogens was 2.5% and methamphetamine 1.3% in 2022 (Ministry of Health, 2022). This is likely an underestimate of methamphetamine use owing to the drug's embeddedness in many marginalized, hard-to-reach populations in rural regions (Wilkins, Prasad, et al., 2018; Wilkins, Romeo, et al., 2018).

Cannabis use in New Zealand appears normalized among younger people (Robertson & Tustin, 2020). Indeed, cannabis was most often purchased from social media among 2020 New Zealand Drug Trends (NZDTS) respondents. Of respondents who had purchased cannabis in the prior six months, 24% had done so via social media (van der Sanden et al., 2021). Most respondents used Facebook (including Messenger) to purchase drugs (60%), followed by Snapchat (48%) and Instagram (20%) (van der Sanden et al., 2021). This indicates a high proportion of

transactions taking place on so-called ‘low security’ platforms (van der Sanden et al., 2022a). The development of novel, local social media drug market trends has also been documented in New Zealand in the form of Discord¹⁵ drug servers (van der Sanden et al., 2022b).

The role played by social media platforms in facilitating arrest relating to drugs and other crimes in New Zealand is emergent. From June to December 2021, New Zealand agencies made a total of 259 legal requests for user data to Meta during this period – the largest number of requests to date – of which 82% generated some “usable data” (Meta, 2022c). Media reports commonly cite encrypted Wickr messages as part of incriminating evidence used to arrest drug traffickers or gang-related trials, but also cite simultaneous intercepting of voice calls and text messages among criminal communications (e.g., Bayer, 2022; Savage, 2022). Additionally, recent reports on a police operation in Queenstown where 12 people were arrested for their role in the local resale of darknet-sourced drugs cited police discovery of a ‘Facebook group’ as the basis of the operation, though details of how subsequent evidence was gathered and how the group was infiltrated were not disclosed (Swift, 2022; Williams, 2023).

This paper explores how people who buy and sell drugs via social media perceive their vulnerability to law enforcement as part of social media drug trading, and the related behaviors and practices they develop to try and counter these perceived vulnerabilities.

Methods

This paper presents a thematic analysis (Braun & Clarke, 2012) of data gathered from anonymous qualitative online interviews with people who use social media to buy and/or sell drugs as part of a broader project exploring the use of social media for drug trading in New Zealand (van der Sanden et al., 2021; van der Sanden et al., 2022b). Thirty-three people participated in synchronous online chat interviews (Bakken, 2022; Barratt, 2012; Gibson, 2022) via the encrypted messaging app Wickr me (Wickr) between July 2020 and September 2021. Interviews were semi-structured to ensure questions were adaptable across a range of different drug market roles and patterns of social media use. Semi-structured interviews provide greater flexibility in responding to issues or experiences raised by participants that might not have been planned for (Brinkmann & Kvale, 2015). Development of the initial interview schedules was based on a comprehensive literature

¹⁵ Discord is a social media platform which enables users to create online customizable communities, joinable via ‘invite link’ – known as ‘servers’ – which they can use to message, voice, and video call with other server members.

review, and the results of an earlier large-scale quantitative survey of people who purchased drugs via social media in New Zealand (van der Sanden et al., 2021).

To encourage open disclosure by participants and address the anticipated difficulties of recruiting from a hard-to-reach population (Coomber, 2011), the research team used the encrypted messaging app Wickr to carry out interviews (see also, Bakken, 2022). We anticipated that prospective participants would be more willing to share their experiences anonymously via direct messaging (Barratt, 2012). The choice of direct messaging as the interview medium also reflected our assumption that many participants would be younger in age (e.g., < 25 years old). We recognized that many young people view direct messaging as more “relaxed” than in-person or phone conversations, particularly when talking to strangers (Gibson, 2020). Participants appeared comfortable using Wickr to complete interviews. However, whether this reflects more general trust in app security may be more complex, and likely reflects participant trust in Wickr’s packaging together of different security features, particularly the ability to sign up anonymously. Wickr has been used in previous research with social media drug sellers internationally (Bakken, 2022; Demant et al., 2019), as well as with surface web cannabis sellers and buyers (Childs et al., 2021).

Participants were recruited using a targeted sampling approach (Watters & Biernacki, 1989) involving different social media channels (Facebook and Reddit) to promote the study, and by physically distributing flyers at the entrance to a dance music festival. New Zealand-based Facebook groups and subreddits focusing on dance music (Forsyth et al., 1997) or cannabis culture were targeted. Group administrators/moderators were approached for permission to post on these forums. Information promoting the study was also posted to social media (Facebook, Instagram, Twitter) by the New Zealand drug checking service *Know Your Stuff*. Participants were required to be aged 16+ and have some experience using social media to buy and/or sell drugs in New Zealand. Interviews were completed over the course of several hours, or sometimes several days if there were breaks between ongoing messages. The longest interview duration was five days. Participants were offered a supermarket voucher as reimbursement for their time.

Eleven participants took part in a small follow-up interview (also via Wickr) six months after their initial interview. These interviews were aimed at further developing an understanding of social media drug markets by enabling clarification and checking of interpretations of responses and views. The follow-up interviews also provided an opportunity to ask participants about additional topics that had emerged from previous interviews with other participants.

The analytical process followed Braun and Clarke's Six-step Thematic Analysis framework (Braun & Clarke, 2012, 2022). We developed the initial coding structures based on a combination of deductive elements drawn from the existing literature and inductive findings generated from initial interviews. Codes were refined as the data collection and analysis progressed. Interviews were initially read and coded by hand based on descriptive data such as apps used for drugs, drug market role and seller types, and perceived risk or negative experiences. For each code group, we maintained a memo detailing any development in thinking and noting interview transcripts or excerpts that were particularly important to the codes in that group. An overarching 'project memo' was maintained to map developing themes and relationships between code groups. We combined this with ongoing concept-mapping to refine relationships between data, codes, code groups and themes.

The original language used by participants in the interviews has been retained as part of the presentation of findings in this paper. Clarification of slang terms in the interview excerpts is provided in non-italicized parentheses.

This research received ethics approval from Massey University Human Ethics Committee Southern A (application code: SOA 20/22).

Findings

Contextualization of sample

Most of the participants used social media only to buy drugs (n=20), while the remainder (n=13) had differing levels of experience both buying and selling. The drug types most often purchased through social media were cannabis (n=25), MDMA (n=23) and LSD (n=23). However, other drug types purchased and sold included ketamine (n=9), cocaine (n=6), pharmaceuticals such as Ritalin and benzodiazepines (n=6) and, psilocybin (n=4) occasionally also diverse novel psychoactive substances (n=3). Cannabis, MDMA and LSD were most often sold among participants with selling experience.

The median age of participants was 24 (IQR=19.5-26), with the youngest aged 16 and the oldest 39. Twenty-two participants identified as male, 10 as female, and one as gender neutral. Most participants resided in New Zealand's more populous North Island (n=23), with 10 living in the South Island. Among participants in the interview sample, Messenger and Snapchat were the platforms most often used to buy and sell drugs (both n=17), followed by Wickr (n=16), Discord

(n=12), Signal (n=5) and Telegram (n=4). In line with findings on the use of social media drug markets internationally (e.g., Demant et al., 2019), participants predominantly used these platforms to connect with sellers and arrange transactions, which were then completed largely via in-person pick up or delivery, and occasionally via post.

Transaction risks and concern for law enforcement

Most participants expressed little concern for law enforcement when using social media and messaging apps for drug transactions. Participants tended to be involved in buying via social media for personal consumption or occasionally supplying their friends, often using social media primarily to access cannabis. These participants considered themselves “small fish”, rationalizing that they were of little interest to law enforcement:

I doubt police would be looking at my socials. Maybe naïve but I feel like they have bigger fish to fry. (P17, F26, buyer)

Participants who expressed greater concern about exposure to law enforcement were more often involved in selling or buying larger quantities of drugs. Alongside drug quantity, drug type was also a factor in either increasing or decreasing participant concern. Class A or B substances like LSD and MDMA were viewed as higher risk because of higher legal penalties faced for their supply and possession versus a Class C drug type like Cannabis. Hence, for buyers buying upwards of 2 grams of a substance such as MDMA or Ketamine was considered more high risk, but for sellers this could be more variable. For example, one seller involved in selling \$50 bags of cannabis in a more commercial local market context professed high concern for police. Another participant involved in the darknet import and social media resale of large amounts of MDMA (e.g., a half-pound, or 228 grams) within a friendship-oriented ‘social dealing’ context had relatively low concern for police.

Participants often reported a lack of direct experience with law enforcement related to their involvement with either buying or selling drugs generally. Some participants had previous experiences with police related to cannabis and this appeared to reinforce their perception of cannabis as being a low priority for police:

Eh the police already have evidence of me buying and selling drugs from a few of my mates’ phones when they got arrested and have seen weed lying out next to a bong in my flat before and not said anything so... (P10, M21, buyer)

Despite this many participants still took steps to manage their risk of exposure to law enforcement. For many participants, the apparent contradiction between their perceptions of law enforcement as low risk, and their use of subsequent digital risk management strategies reflected an ingrained awareness of the pitfalls of online communication that could lead to unwanted exposure to others. In these instances, participants often referenced two core aspects of the social media environment which guided their use of digital security strategies: Data persistence and imagined audience.

Factors influencing vulnerability to law enforcement on social media

Data persistence

Data persistence was often referenced by participants as a principal drawback of using social media and messaging platforms for drug trading. Participants articulated a belief that their online data and messages remained ‘online forever’:

I guess you have to factor in that anything you put on the internet is essentially out there for good and you can't take it back. So knowing there is a paper trail of messages etc is a downside and a risk. (P17, F26, buyer)

The availability of incriminating messages over time was viewed as an accumulation of evidence. Some participants had knowledge of people who were incriminated because of permanent messages, often involving the use of Facebook Messenger:

I know someone who got busted via facebook messages during a raid. I think they got their phone and just went through it... it was taken from them. (P19, F26, buyer).

For this reason, consideration of data persistence was a key factor in how participants looked to manage their risk of exposure to law enforcement, and one which guided how they used other risk management strategies or juggled different platforms for drug trading purposes.

A broad audience

In combination with the problem of data persistence over time, many participants articulated the difficulty of controlling their social media audience as a point of vulnerability to police exposure. For participants, situating the risk of exposure to law enforcement as part of social media drug trading involved acknowledging the continuous potential for information to be made visible to the ‘wrong’ people, either through their interaction with different platforms, or because of others viewing their phone screens:

The fact the wrong person could be looking at my phone at the wrong time, so cautious with that too... if I leave my phone sitting around. (P24, M31, buyer/seller)

I think them (the seller) getting caught and the police going through their social media contacts or the police pretending to be them... (P30, F17, buyer)

When you sign up to Signal it alerts all your contacts that also have Signal! I got a notification that my boss had joined signal... the information feels insecure and could either be leaked to cops or friends. (P19, F26. Buyer)

These excerpts underscore how participants tended to experience vulnerability to law enforcement on social media in ways that merged exposure to police with the potential for surveillance and scrutiny from others in their social networks. As the example from P19 illustrates, exposure to one's employer on social media could easily be extrapolated to serve as a general 'proxy' for increased risk of exposure to other groups, including the police.

Digital trace data and social media data collection

Many participants were aware of social media data harvesting, and the potential for this data to be accessed by third parties. The availability of this data and the potential for police access to it was sometimes viewed with a sense of resignation and indifference:

My data's been bought and sold a thousand times by now I don't care which company has it anymore. (P10, M21, buyer)

However, when it came to thinking about the likelihood of their data being accessed by law enforcement or requested using a warrant, most participants rationalized this level of effort as not likely to be justified by their "small fish" status:

If someone wanted to collect all my digital trail and bust me I'm sure they could, but I think a huge portion of people my age don't think any cop cares enough about that kind of stuff to do anything. (P27, M23, seller)

The level of effort participants assumed it would cost police to request their data from social media companies then meant this was a threat that predominantly affected sellers or people more heavily involved in their local drug trade. Among participants who were more concerned about exposure to law enforcement, data collection by social media companies such as Meta was viewed as another reason to avoid these platforms for drug trading, regardless of actual practice, and a strong incentive to use encrypted messaging apps:

Oldmate Zuck [Mark Zuckerberg] can just look for a couple keywords and send in what he finds to law enforcement. Stands true for any big social media. Which is why sellers should move away from social media and use applications with privacy in mind. (P32, M19, buyer/seller)

If you want to be secure and private use something like wickr or the dark web... but Facebook and other social media platforms? You give them the right to see your data when you sign up. (P8, M23, buyer/seller)

Following on from this, the first risk management strategy turned to by many participants to insulate themselves from possible police surveillance was the strategic use of different platforms to facilitate greater security around the most high-risk drug transactions.

Perceptions of platform security: Platform ownership and shifting ‘locations’

Most participants made use of platforms for drug trading that had one or more of three key “security” features: (1) message timers or self-deleting data; (2) username-based sign up; and (3), end-to-end encryption. The more security features a particular platform had, the more appropriate it was perceived to be for drug transactions involving a higher risk of legal penalties, such as large quantity purchases, selling drugs, or transactions involving Class A drug types. Participants often used platforms such as Wickr to add security to more “high stakes” drug transactions that would result in more severe legal penalties, while conversations about “low risk” transactions could take place in less-secure settings like Snapchat. Though buyers often followed sellers to high security platforms in commercial drug trading contexts, this could be complicated in a normalized drug market involving social supply, where low risk perceptions could prevent sellers from shifting to more secure encrypted messaging apps. Additionally, platforms like Wickr occupied a position well outside participants’ day-to-day social media engagement which helped them keep their drug trading practices separate from their day-to-day social media use. In this vein, encrypted messaging apps helped participants manage their “imagined audience” more effectively, by serving as platforms used specifically for drug trading.

However, perceptions of platform security could extend beyond platform features. For example, encrypted messaging apps and their association with a need for secrecy made some participants feel as though they were ‘advertising’ their involvement in drug trading to others. In this instance, participants considered what the using encrypted messaging apps ‘said’ about them from the perspective of an onlooker. In this vein, using platforms like Snapchat for drug trading

could *also* function as a risk management strategy by allowing buyers and sellers to transact on an inconspicuous, mainstream platform:

P21: *I think Wickr is great but it's less commonly used and definitely for your more paranoid user. I think there would be a certain level of suspicion if other people saw it on your phone.*

Interviewer: *So Snapchat is kind of like a "normal" app to have on your phone, and you already use it to chat with mates so it doesn't feel as dodgy?*

P21: *Yeah exactly. (M17, buyer)*

Participants with a more comprehensive understanding of app features and online security tended to stress the need to consider additional platform features when thinking about their suitability for drug trading. For example, several participants placed importance on platform ownership, and prior knowledge of company cooperation with law enforcement as important factors to consider when engaging with social media drug markets:

Telegram is such a good app and I don't trust Facebook. The fact that they've been pressured by governments to hand over data and haven't. That's a pretty big tick... if Telegram aren't handing over any data at all then I don't worry about my account being tied to my username or my phone number. (P9, M29, buyer/seller)

ASW [Amazon Web Services] bought Wickr so some people rumour about it but I trust it... Wickr has a good rep and validation by third parties. I wouldn't trust the Bezoses of this world as far as I could throw them... in saying that ANOM has taught the world it's good to know who owns your software. (P25, M27, buyer)

These examples highlight the importance of broader consideration of platform security beyond platform features. This type of understanding was often lacking among participants involved in small-scale buying or social supply behaviors. Participants with a deeper understanding of online security often also considered using or made use of additional online security features such as VPNs or removing EXIF data from images they posted or sent as part of social media drug trades. However, ultimately, even participants in this group appeared to balance their need for additional online security with the principal reason they used social media for drug trading to begin with – convenience:

I'm also lazy so don't take all the precautions I should [such as] separate Discord for social and drugs, not sending direct to myself, VPN. But in reality the way I use Discord

I find a nice compromise between safety/anonymity and convenience. (P23, M21, buyer)

Managing exposure to law enforcement on “low security” platforms and drug markets

Despite the emphasis placed on staying away from low security platforms such as Messenger for drug trading, many participants continued to use these platforms for small-scale trades between friends. Additionally, some participants made use of large, more “public” social media drug markets such as “lower tier” Discord drug servers, which are characterized by a high level of accessibility and a large size. In these settings, participants felt at risk of exposure to “undercover” police. In these environments, platforms lacked many of the features participants equated with greater security from police. As a result, they developed tailored risk management strategies which were geared towards managing “imagined surveillance” in lieu of these platform protections.

Managing law enforcement risk in “lower tier” Discord servers

Discord drug servers enabled buyers and sellers to transact using pseudonyms. Though this feature was useful as a means of providing some protection from police, it also challenged people’s ability to “survey their surroundings” for law enforcement, as is characteristic of risk management strategies in offline, street drug markets for example. As a result, market members were often highly sensitive to perceived shifts in the drug server environment, as well as to nuances in their interactions with others on the drug servers:

There was a lot of paranoia and finger-pointing around any perceived shift in culture within the servers. One server had a mass exodus after the admins sold it on to an anonymous buyer, after which they immediately started requesting photo ID with verifications¹⁶... It was the biggest server at the time too, so it just came across as really suspicious. (P15, F31, buyer/seller/ex-drug server admin)

*I got a message like this “Need a 50 outdoor indica to dome, free late night drop”.
Feel like now one really talks like that lol (P6, F19, buyer)*

¹⁶ To buy and sell on a Discord server, buyers and sellers often had to ‘verify’ themselves to server administrators. This often referred to a process of posting a picture of drugs or drug paraphernalia, the date, and their Discord username and four-digit account tag.

These excerpts underscore how server members used available online cues such as the structure of messages they received or visible changes to drug server features to make judgements around the potential for exposure to police.

Notably, drug servers also contained channels where members could post warnings to others of police check points or arrests involving other market members, creating a community-based awareness of local police presence. The sharing of knowledge related to police activities potentially helped server administrators to address the risk of police infiltration, and also helped members to avoid police as part of completing transactions offline:

It's building up quite a community feel ATM [at the moment] ... someone got stopped by the police and their phone was taken (I'm assuming they were arrested), once people were aware of that, the person's access to servers were stopped. (P7, M39, buyer)

On Discord drug servers, managing the risk of exposure to law enforcement primarily meant focusing on the attributes of other market members, and of the servers themselves. Considering the actual security of the platform appeared to be almost an afterthought for most participants in this setting. This represents an important point of contrast to the importance of platform security features (or lack thereof) to risk management in other social media drug market environments.

Using 'code' to talk about drugs on Messenger

While some participants in Facebook selling groups mentioned the use of emojis by sellers to advertise drugs, sellers on Discord servers did not tend to use code, instead opting to advertise drugs more openly. However, almost every interviewee who made use of Messenger for drug trades, often with friends or social connections, emphasized the importance of using code language to 'disguise' drug trading conversations. In these contexts, the social nature of buyer and seller contacts allowed them to construct more personalized code words and language to disguise drug trades:

It was usually people asking if they'd come over, or asking for colors, or coded substances in a message... When stuff arrived it would usually be a "hey you should come over for a sesh" and they'd know. (P12, Gender neutral, 25, buyer/seller)

I never did the "hey have you got any bottles of milk/crayfish/whatever" sort of thing... I always thought that was pretty stupid and obvious. I would say the vast

majority of the time if someone unlocked my phone it would be indistinguishable from a normal conversation. (P18, M26, buyer)

In keeping with the above excerpts, interviewees' perceptions of what counted as effective code language varied. The aim of using code language was primarily to mask drug trading conversations, as well as to limit the amount of obviously incriminating evidence that accrued in Messenger chats. This meant thinking about how messages would be visible to others in the event a phone was taken, or messages were read by the wrong person and exemplifies the evolving social practices that can characterize responses to "imagined surveillance".

There were instances where participants neglected to use code when using platforms like Messenger. For example, the quote featured in the title of this paper refers to **P32's** (M19, buyer/seller) experience using Messenger to both buy and sell drugs without using code or the secret chats feature. For some participants, a gradual shift away from using code on platforms like Messenger reflected the challenges of managing a general accumulation of drug-related messages and content as part of group chats with friends, which made using code specifically to talk about small transactions seem pointless:

These days I don't have really a formal code with anyone. If someone got my messenger chats there would definitely be some stuff in there, but there's literally photos of me doing lines in some group chats, so I think you just don't worry too much at a certain point. (P27, M23, seller)

In some instances, participants who felt they had left a trail of incriminating messages behind on Messenger made the effort of combing back through their chat history and manually deleting drug trading conversations.

The perceived need to use "code" language tended to decrease as participants shifted to more secure platforms offering features like end-to-end encryption and self-deleting messages. However, even on "more secure" platforms like Snapchat, participants were still aware of the potential for drug-related messages and snaps to spread beyond their intended audience. To minimize the unwanted spread of incriminating evidence, sellers often avoided posting photos of their stock, opting to keep "adverts" vague, or not use them at all:

Hahaha, no way! No stories at all... I have had experience with people like this in Aussie. But they seem to get arrested or busted a lot. In my opinion I think it's a risky and stupid way to do it. You can be a lot safer and make the same money. (P24, M31, buyer/seller)

Despite the ability to post private stories, visible to only selected contacts on Snapchat, P24 continued to feel that the only guaranteed way to avoid incriminating stories being spread to the wrong people was not to post them at all. He insisted on only communicating one-to-one with his buyers, and only via snap (images/photos), explaining that messages were far easier to save on Snapchat.

Discussion

This paper has explored how understandings of digital privacy and the potential for surveillance as part of broader day-to-day engagement with social media and messaging apps influences how law enforcement risk is perceived and managed among people involved in small-scale social media drug trading. In this context, the concept of “imagined surveillance” (Duffy & Chan, 2019), helps to explain the apparent contradiction between participants self-expressed low risk perceptions around exposure to law enforcement, and their subsequent use of diverse digital risk management behaviors. Our participants were often young people involved in low-risk market roles and using social media drug markets largely to access these drug types amid reportedly low risk perceptions around law enforcement. However, low risk perceptions were paralleled by the use of a range of risk management strategies that addressed what participants perceived to be digital risk areas which could become potential sources of exposure to others such as employers or family members. This is in keeping with “imagined surveillance”, where social media users often already assume people beyond their immediate social networks are scrutinizing their social media presence and factor this into how they use different platforms (Duffy & Chan, 2019). We have suggested that perceptions of digital data as permanently accessible, lack of control over digital audience, and digital surveillance by others help inform participant perceptions of how they could be caught by police, and subsequently what constitutes ‘good’ digital security practice as part of drug trades.

Low risk perceptions around being caught by police among people who use digital drug markets, particularly for buying purposes have been documented by researchers (e.g., Aldridge & Askew, 2017; Childs et al., 2022). Though people often reported a concern for their digital trace data as a potential source of law enforcement risk, they often continued to perceive this as difficult for the police to access, or not a policing priority (Childs et al., 2022; Moyle et al., 2019). Although law enforcement risk appears to be of low concern to many involved in small-scale digital drug market transactions, there continues to exist considerable uncertainty and ambiguity around precisely how, where and when exposure to law enforcement could occur. Our findings suggest

that this uncertainty may in part be understood and responded to via people's established understandings and practices of navigating a broader social media landscape and its implications for personal privacy and security.

Cherbonneau and Copes (2006) have suggested that many people involved in crime base their perceptions of policing practices and priorities on partial heuristics which may not be reflective of actual policing practice. These partial heuristics are likely to be exacerbated in a social media environment, where the pathways through which people can be exposed to or watched by others are seemingly endless, and often beyond individual control (e.g., Lyon, 2018; Marwick & boyd, 2014). The embedding of drug trading behaviors into this social media environment may then mean that people take a more *general* approach to managing the potential for digital exposure to outsiders. Among our interview sample direct experience of actual police practice was low and resulting 'knowledge' often based on anecdotal reports from others. But participants *were* highly aware of how they could be exposed through social media features such as permanent chat logs or by receiving notifications on their phone screen. This reflects the way that thinking about and managing potential for unwanted surveillance on social media generally, translates into risk perceptions and management strategies that can be applied to drug trading (Duffy & Chan, 2019). In this sense, though participants might not have been overly concerned about exposure to law enforcement, they could easily situate police as part of their general perceptions of "imagined audience" (Litt, 2012) on social media. This more general perception of digital audience helps to explain why participants often conflated exposure to an employer, or family members with increased vulnerability to police.

Participants varied considerably in what they perceived to constitute adequate digital security for drug trading, as well as how they interpreted and prioritized platform security features. These findings can be tied into the importance of "imagined affordances" in shaping participant perceptions of vulnerability to "imagined surveillance" (Duffy & Chan, 2019). Nagy and Neff (2015) argue that people's perceptions of platform affordances are not per se 'true' or 'right', but rather are often the result of a process of 'imagination' that encompasses user beliefs and expectations as well as direct knowledge. This helps to explain why participants tended to base their perceptions of security around consideration of a broad range of variables beyond simply platform features, for better or for worse (See also, Bakken et al., 2022). For example, participants' consideration of factors like platform ownership and past cooperation with law enforcement could sometimes *trump* the need for certain security features. Ladegaard (2018b) has suggested people using darknet drug markets place their trust in "expert systems", whereby a reliance on technologies the individual does not fully understand can make them oblivious to the potential

for police exposure. This perspective links back to the uncertainties of both perceiving and navigating law enforcement risk in social media drug trading. Though social media and messaging platforms are by design easy-to-use, people's familiarity with them and established understandings of their features may not per se translate into more accurate perceptions of platform security (See also, Moyle et al., 2019).

On Discord drug servers for example, the more 'open' nature of many drug servers meant that many interview participants were primarily concerned with the "imagined affordance" (Nagy & Neff, 2015) of pseudonymity. They felt this feature both made them vulnerable to potential undercover police officers operating pseudonymously on the drug server, but also felt it insulated them from police. The resulting reliance on visual cues to decipher whether a potential transaction partner was legitimate or not bears similarities to risk management strategies documented among people involved in drug sales or other types of crime involving mandatory interactions with strangers (e.g., Holt et al., 2014; Jacobs, 1996). However, in social media drug market settings, the infrastructure through which transactions are organized is an additional parameter people need to factor into their risk management practices. Discord's pseudonymity could make participants feel secure, but digital forensics experts have in the past illustrated that the platform offers its users little data security, allowing law enforcement to easily recover a range of user data including plain-text messages and images (Moffitt et al., 2021). Hence, in this case a focus on particular "imagined affordances" can obscure deeper issues around platform security which may have ramifications for law enforcement risk.

Many participants in this study expressed a sense of resignation about the collection of their digital trace data by social media companies, though many continued to view the likelihood that police would access this data as low risk (e.g, Childs et al., 2022). Though these perceptions may not be inaccurate in a context of small-scale drug trades and law enforcement risk, drug-related digital trace data sources may lead to broad and unexpected future repercussions as they flow into user profiles and data products social media companies sell to third-parties (Elmas, 2021; Hern, 2022b). As one interviewee neatly put it: "*Facebook probably knows that I sell drugs*" (P9, M29, buyer/seller). Indeed, growing awareness of police use of social media data sources as part of big data policing practices (e.g., Brayne, 2017, 2020; Ferguson, 2017a) may increasingly be paralleled by the potential for drug-related digital trace data to impact future opportunities across a person's life regardless of whether legal sanctions are faced. The potential for such broad impacts reflects the likelihood that these data sources will be reused and combined for different purposes by a range of actors in sectors such as advertising, employment, education, and insurance (e.g., Kitchin, 2014; Zuboff, 2019). As younger age groups "grow up digital", they are

increasingly likely to bear the brunt of the evolving and unpredictable ways in which their digital trace data may impact their future lives.

Limitations

Our findings are based on a non-representative sample of people who buy and sell drugs via social media and their self-report experience. Most of the participants in this study predominantly used social media to purchase small amounts of drugs, often cannabis and MDMA, within personal and extended social networks, rather than for large-scale drug selling for profit. These sample characteristics no doubt influenced their reports of low-risk perceptions and fragmented risk management strategies. Larger-scale drug sellers are likely to have different risk perceptions related to law enforcement and more comprehensive risk management strategies. It is also likely that law enforcement agencies will be more focused on large-scale drug selling on social media rather than small quantity purchases, reflecting the very large number of small-scale trades and small legal penalties involved.

Conclusion

Our study participants using social media and messaging platforms for small-scale illegal drug trades reported low levels of concern about law enforcement risk. Yet these participants were well-versed in thinking about and responding to many of the privacy risks of online social media communication, such as data persistence and the potential for content and messages to be easily spread beyond their intended recipients. This paper suggests that an understanding of these factors may guide people involved in small-scale purchasing of illegal drugs via social media and messaging platforms, regardless of whether they perceive this risk as high. Our participants largely focused on minimizing the likelihood of exposure to law enforcement by seeking to control factors like message visibility, language, and exposure to unknown market members. They expressed resignation regarding the collection of their data by social media companies, and the potential for it to be shared with law enforcement. In this sense, people who use social media drug markets engage with these markets despite an awareness that their digital trace data may be enough to incriminate them.

The embedding of illegal drug trading within social media may have important implications for the risk of drug market involvement impacting other areas of people's lives. This is noteworthy, particularly as there is mounting evidence of policing approaches in many western

countries shifting towards alternatives to punishment for minor drug offenses such as possession (e.g., Abbott, 2019; Bacon, 2022; Mannheim & Frost, 2022). The integration of digital trace and social media datasets across a growing range of sectors may mean that people who interact with social media drug markets face negative reputational consequences beyond legal repercussions and criminal records. Criminal records for minor offences such as drug possession have negative impacts on employment prospects (Uggen et al., 2014), and educational opportunities (Stewart & Uggen, 2020), compounding social and economic inequalities. However, in the future data linkages between individuals and the purchase, sale and consumption of illegal drugs may serve as invisible 'proxies' for criminal involvement in the absence of an official criminal record. In this vein, drug-related digital trace data may perpetuate many of the same stigmas and harms associated with legal sanctions, shaping employment, educational and travel opportunities, housing, and insurance coverage throughout a person's life. As such, though perceptions around drug use and minor drug offenses may be softening in many western societies, it may equally be that the long-term repercussions of having a drug-linked "digital footprint," (Koops, 2011) become more invisible, far-reaching, and entrenched.

Chapter 9: Social supply and the potential for harm reduction in social media drug markets

Chapter 9 presents an in-depth exploration of the potential for harm reduction from the expanded social supply dynamic enabled on social media. In this vein, it expands on findings presented in chapters 5, 6 and 7 to consider how social media drug trading may be used to reduce drug market harms such as adulterated substances and victimisation whilst still facilitating streamlined drug access. The chapter findings contrast with those presented as part of Chapter 6, which explored how young people could be placed at greater risk of drug market harms because of their interactions with “lower tier” Discord servers. Chapter 9 utilises affordance theory (Section 3.2.1) to consider how adaptation of platform affordances to facilitate social supply is tied into the expansion of these ‘lower risk’ social supply markets. This paper was published in *Contemporary Drug Problems* in May 2023.

van der Sanden, R., Wilkins, C., Rychert, M., & Barratt, M. J. (2023). Social Supply and the Potential for Harm Reduction in Social Media Drug Markets. *Contemporary Drug Problems*, 50(3), 00914509231178940. <https://doi.org/10.1177/00914509231178940>

Abstract

Background: Existing studies have highlighted the potential for increased drug market risks from buying drugs via social media involving strangers, such as receiving adulterated drugs or being robbed. However, social supply-driven social media drug markets may also offer enhanced social dealing and harm reduction opportunities.

Aim: To explore how social media platform features that enable expanded social networking may also support safer social drug dealing and other harm reduction behaviours.

Method: Thematic analysis of anonymous online interviews with 33 people who buy and sell drugs via social media in New Zealand.

Results: Participants (median age 24; 22 male, 10 female, 1 gender diverse) accessing drugs via social media mostly utilized established social networks. These personal networks offered many benefits commonly associated with social media drug trading (i.e., safer, and secure drug purchasing). Benefits included reducing the risk of receiving adulterated substances and being victimized. Social media affordances, which participants used to expand their everyday social networks, could also increase participants' ability to leverage a broader social drug supply network and access related harm reduction benefits. Some participants used darknet markets to buy drugs, which they then resold to 'friends' via social media platforms, facilitating supply channels that were largely 'separated' from local physical drug markets and associated problems of fraud, violence, and organised crime.

Conclusion: Social media drug markets offer a range of harm reduction benefits that contribute to a lower risk local drug market. We suggest this may reflect a closer alignment between social media platform affordances and their adaptation to social supply drug trading.

Introduction

Social media drug trading is evolving quickly, with studies pointing out this development makes drugs more accessible to young people (e.g., Demant & Bakken, 2019; McCulloch & Furlong, 2019; van der Sanden et al., 2021). The resulting heightened drug accessibility reflects the convenience of social media and related drug trading behaviors. The portability of smartphones and familiarity of interactive social media platform features that streamline the creation and sharing of content, is coupled with drug transactions that are often based around quick local pick up or delivery (Demant et al., 2019; Moyle et al., 2019). Underlying these factors are the ways in which social media enhance people's ability to connect with one another, either as strangers, or via existing social networks (e.g., Carr & Hayes, 2015).

Bakken and Demant (2019) argue social media drug markets make it easier to connect with *both* people one already knows and strangers. However, most current research has focused on the latter, that is, impersonal, 'profit driven' (Moeller, 2022) social media drug markets characterized by ease of entry and transactions between strangers. Examples include Facebook selling groups (Demant et al., 2019), Discord drug servers (van der Sanden et al., 2022b), and anonymous seller profiles on platforms like Instagram and Snapchat (McCulloch & Furlong, 2019). Impersonal social media drug markets have also been disproportionately reported in the media (e.g., Adkisson, 2022; Nichols, 2020). They are the focus of much adult public concern, given that the young userbases of platforms like Snapchat, Instagram, Discord, and TikTok are likely to use or be targeted by this type of selling (Lerman & De Vynck, 2021). This focus reflects the entrenchment of broader cultural perceptions around drug dealers 'targeting' young people for economic gain or deliberately selling them adulterated drugs (Coomber, 2006). However, the potential for young people to be at risk of harm while participating in this type of social media drug market is illustrated in the United States, where the sale of fentanyl-laced pharmaceuticals by anonymous sellers on platforms like Snapchat has resulted in a number of teen overdose deaths (e.g., Hoffman, 2022; McCormick, 2021).

Researchers have suggested that all drug markets, regardless of the extent to which they are digitally mediated, present users with different configurations of potential for increased and *decreased* harms (See for example Aldridge et al., 2018 regarding darknet markets). In this vein, the harm reduction potential of social media drug markets has yet to be explored in depth. The concept of harm reduction broadly describes different strategies or practices which prioritize the goal of reducing drug-related harms, acknowledging that a reduction in drug use may not be desirable or feasible, and that drug harms may be reduced from other vectors (Lenton & Single,

1998). This paper uses harm reduction to describe the role of social supply behaviors in reducing the potential for drug market harms such as drug adulteration for buyers, and victimization for sellers (e.g., Potter, 2009).

This paper aims to address this current research gap by exploring how social media drug markets may facilitate the harm reduction benefits of a less-commercial local drug market environment characterized by social supply (e.g., Potter, 2009). As part of this endeavor, we explore how these benefits may be linked to darknet drug supply via ‘darknet social dealers’ – people who purchase drugs from the darknet and resell to ‘friends’ using social media and messaging apps. To illustrate how social media platforms may impact on social supply practices and their associated harm reduction benefits, we draw on the communications theory of affordances (Gibson, 1979). We use affordance theory to discuss how particular platform features lend themselves to an increased ability to link others to their local, physical social networks, facilitating the streamlining of an expanded social supply dynamic.

The structure of our paper is as follows. We begin by outlining the concept of affordances and link this discussion to the importance of alignment between people’s online and offline¹⁷ social networks on platforms like Facebook, Snapchat and Instagram. This section is followed by a discussion of the social supply literature, and its links to harm reduction impacts. We then briefly outline the New Zealand drug market context and what is known about social supply and social media drug market dynamics locally. Finally, we discuss the potential for overlap between darknet drug trade and social media drug markets, and how this may impact harm reduction resulting from social media social supply. The presentation of the findings of our study draws on this literature review by first emphasizing the ease with which social networks can be expanded on social media, and how this facilitates many of the harm reduction benefits often associated with social supply. We then illustrate how social media and messaging app features can be used to root potential drug connections more firmly and efficiently into offline social networks, allowing people to expand social supply networks at little additional risk. Finally, we tie our results into the potential role of the ‘darknet social dealer’ in facilitating social supply networks that may be farther removed from other, existing, local drug supply channels. In our discussion, we further contextualize our findings using affordance theory, contrasting the potential benefits of social media social supply against what can be the increased potential for drug market harms associated

¹⁷ We use the terms ‘offline’ and ‘online’ throughout this paper to mirror how social media-facilitated social supply was represented and characterized among our interview participants. However, we acknowledge that online and offline may not be clearly differentiated as part of people’s contemporary day-to-day lives.

with more anonymous social media selling. We also identify avenues for further research involving harm reduction in social media drug trading more broadly.

Affordances and social media

This paper uses the concept of affordances (Gibson, 1979) as it relates to communications and social media to frame our exploration of participants' experiences using these platforms for social supply and social dealing. In this context affordances represent the relationship between a platform's design features and user behaviors (Hutchby, 2001; Treem & Leonardi, 2013), or the "*possibilities of action*" a platform presents its users (Evans, Pearce, et al., 2017, p. 36). Scholars acknowledge that the design and orientation of different social media platforms have implications for how people can use and adapt them (Evans, Pearce, et al., 2017; Hogan & Quan-Haase, 2010). Important to this paper is the extent to which platform affordances 'support' and 'resist' user actions. For example, Davis (2020) uses the terms *demand, request, encourage, discourage, refuse, and allow* to describe the different ways in which platform affordances respond to user behaviors (See also, Davis & Chouinard, 2017). In this paper, we principally consider how *three* social media affordances interact to facilitate expanded social supply-driven drug markets on social media: visibility (boyd, 2014), association (Treem & Leonardi, 2013) and communicative affordances (Hutchby, 2001).

Visibility affordances describe to the ways in which social media platforms make personal information easier to view and reduce barriers to locating that information (boyd, 2007; Treem & Leonardi, 2013). Second, association affordances are how social media platforms make people's relationships to others and their relationships to content more visible (e.g., visible friends' lists on Facebook, followers/following lists on Instagram, platform-based recommendations of accounts to follow or add, tagged photos) (boyd & Ellison, 2008; Treem & Leonardi, 2013). Finally, communicative affordances broadly describe the diverse ways in which social media platforms and messaging apps facilitate communication with others (mass communication, one-to-one or in groups) through the creation, sharing and altering of content (Bucher & Helmond, 2018; Hutchby, 2001). We suggest that these affordances are particularly useful when considering the centrality of people's offline social lives and networks to their engagement with social media, and how this relationship can be used to expand 'lower risk' drug access through social connections.

Social networking and “anchored” relationships

Some platforms like Reddit, and Twitter are more specifically designed to facilitate and encourage connection with strangers (Copland, 2021; Phua et al., 2017). However, for many people, the substantial bulk of their daily social media engagement involves connecting and communicating with people known to them *offline* (e.g., Baym, 2015; boyd, 2014; Ellison et al., 2007; Subrahmanyam et al., 2008; Yau & Reich, 2020). “Keeping in touch with friends and family” has been identified as the primary reason people engage with social media platforms globally (We Are Social & Hootsuite, 2022), illustrating the importance of alignment between our offline and online social lives. This type of offline/online network overlap is often most closely associated with platforms like Facebook, Snapchat, Instagram (to varying extents) and messaging apps like WhatsApp and Messenger (e.g., Alhabash & Ma, 2017; Phua et al., 2017).

Researchers have argued that social media, particularly social networking sites like Facebook, facilitate an expanded social networking dynamic beyond what could be maintained and managed in offline settings (Ellison et al., 2007; Haythornthwaite, 2005). Donath characterizes these social networks as “social supernets” (2007). “Social supernets” hinge on the three aforementioned affordances, and their use in a context where offline and online identity are aligned (Donath & boyd, 2004). The clearest example of the importance of offline/online identity and network alignment in this context is Facebook. Facebook *demand*s or ‘insists’ (Davis, 2020) people sign up using their offline identities or ‘real’ names and construct visible personal profiles (Gehl, 2016; Marwick, 2005; Van der Nagel, 2017), though some members continue to use pseudonyms that look real enough, and multiple profiles can be created (Haimson & Hoffmann, 2016). A Facebook user is then encouraged to ‘add friends’ – recognizable to the individual through their own visible profiles linked to their offline identities. Facebook streamlines users’ ability to communicate with this large network via features like stories, timeline and newsfeed posts or status updates, the creation of groups, or one-to-one and group messaging. Platforms like Instagram and Snapchat take a more lenient approach that allows the use of pseudonyms. Additionally, a platform like Instagram is associated with the creation of multiple accounts, not per se linked to a person’s offline identity, such as ‘finstas’ (“fake instas”), which are often reserved for close friends only (Kang & Wei, 2020). However, Instagram and Snapchat continue to provide cues that *encourage* or ‘guide’ (Davis, 2020) people to connect with their friends and offline social networks on the platform (e.g., synced contacts, tagging photos, suggesting accounts to follow or add, integration of personalized Bitmoji avatars, location sharing on Snapmaps).

The ability to make one's associations with others visible provides an important means of communicating or 'signaling' trustworthiness on social media (Donath, 2007; Donath & boyd, 2004; Treem & Leonardi, 2013). Here, people can be judged not just by the information in their profiles, but by the types of people in their networks (Donath, 2007). In turn, this type of personal, information-rich landscape gives rise to increasingly normalized behaviors of investigating and gathering online information about others in or connected to one's own social networks (Lampe et al., 2006), colloquially known as "stalking" (Antonini et al., 2019). As such, in contexts where people use social media to align their offline and online lives, platform affordances like visibility and association make it easier to place people in their offline social contexts. Zhao et al. (2008) refer to this type of social media connection as "anchored relationships". This paper explores how an increased ability to "anchor" people in their local offline social networks as part of social media drug trading may facilitate the ability to leverage social supply more broadly, and in turn the harm reduction benefits associated with this type of drug market context.

Social supply and harm reduction

Social supply and 'social dealing' drug markets effectively represent 'closed' drug market structures (May & Hough, 2004), with transactions embedded in 'friendship' constructs emphasizing reciprocity rather than commercial gain between transaction partners (e.g., Parker, 2000; Potter, 2009; Wense, 2008). To take part in these drug supply networks, participants must be socially linked – meaning 'friends' and 'friends of friends' (Chatwin & Potter, 2014; Potter, 2009). Social supply refers to behaviors characterized by little to no profit such as sharing drugs or buying for the group at a price to cover expenses (Coomber & Moyle, 2014). However, Taylor and Potter (2013) have coined the term 'social dealing' to encompass social supply networks that become more commercial in nature over time, with bigger volumes of drugs bought and sold for larger profit margins on the part of sellers. They argue that this type of drug market is essentially a commercial market, albeit one that remains rooted in many of the norms of social supply (Taylor & Potter, 2013).

Social supply-type drug markets provide an important buffer between many, often younger, buyers and their local commercial drug market environment (Coomber & Turnbull, 2007). In these environments, the 'friendship' ties between buyer and seller work to greatly lower the risks of rip-off or robbery, though that is not to say these risks are removed entirely (Jacques & Wright, 2015). Social supply increases seller accountability for factors like drug 'quality' (Belackova & Vaccaro, 2013; Bright & Sutherland, 2017), and violence and victimization in this

type of drug market are rare (Jacques & Wright, 2015; Mohamed & Fritsvold, 2010; Taylor & Potter, 2013). Indeed, motivations of convenience, trust and safety often dominate among people involved in this type of drug market dynamic (Hathaway et al., 2018).

Notably, people engaging with online drug markets have cited a continued preference for social supply, either to supplement engagement with darknet markets (Barratt et al., 2016), or as an alternative to purchasing from anonymous sellers on social media (Moyle et al., 2019). Previous research has also found platforms like Snapchat and Messenger, often already in use among friendship groups, to be commonly linked to social supply dynamics. These platforms can become tools for ‘avoiding’ interactions with commercial sellers on social media (van der Sanden et al., 2022a).

Social supply and social media drug markets in New Zealand

In New Zealand, there is little published research specifically exploring social supply. However, there are indications that this type of drug supply is commonplace, particularly for drug types like cannabis (Rychert & Wilkins, 2022). Findings from the Illicit Drug Monitory System (IDMS) – a convenience survey of people who frequently use drugs across New Zealand’s major cities – consistently indicated high levels of drug purchasing from sellers defined as “friends” or “social acquaintances”, especially for cannabis and MDMA (Wilkins et al., 2017). These findings are complemented by research on the normalization of recreational drug use in New Zealand, which features some discussion of the importance of young people’s social networks in brokering easy access to the aforementioned drug types (Hutton, 2010; Robertson & Tustin, 2020).

New Zealand Drug Trends Survey (NZDTS) findings drawn from a large convenience sample of New Zealanders who use drugs (N=23,500), have indicated there may be an association between social media drug purchasing and using a more commercial seller type (van der Sanden et al., 2021). Respondents who had purchased cannabis, methamphetamine, ecstasy/MDMA and LSD from a social media ‘location’ were more likely to have purchased from the fixed list options of “drug dealer” or “gang member/seller” than from either a “social acquaintance” or “friend/family” (van der Sanden et al., 2021). This relationship indicates the potential for social media drug markets to push younger age groups into more commercial drug market settings, as has been suggested by researchers internationally (Demant et al., 2019). However, interviews with people who use social media and messaging apps for drug trading have also indicated that social media-facilitated social supply is often not perceived as ‘buying drugs off social media’ by virtue of the social context surrounding transactions and more regular contact between buyer and seller

(van der Sanden et al., 2022a). These findings suggest there may be a sizeable social supply undercurrent to social media drug trading in New Zealand.

The potential for increased access to more commercial seller types among young New Zealanders who engage with social media drug markets was illustrated in a recent study of Discord drug servers. Barriers to entering many of these spaces were low, but young people often contended with a melting pot of different seller types, including alleged gang-affiliates, and high levels of opportunism among members (van der Sanden et al., 2022b). New Zealand patched gangs¹⁸ have historically been linked to local organized crime, specifically the emergence and expansion of the methamphetamine trade since the early 2000s (e.g., Gilbert, 2013; Newbold, 2016). Recent reports suggest their involvement may be increasing and becoming more sophisticated, particularly in relation to the local drug trade and methamphetamine import, manufacture, and supply (Breetzke et al., 2022a; Wilkins, Romeo, et al., 2018). Historically, gangs have been linked to particular types of retail level drug market in New Zealand, such as ‘tinny houses’, a type of open drug market (May & Hough, 2004) where drugs – typically cannabis, but sometimes also methamphetamine – are sold from a house that is accessible to the public (Gilbert, 2013; Wilkins & Casswell, 2003; Wilkins et al., 2005). Their alleged presence on accessible Discord drug servers highlights what may be the changing interplay between different segments of New Zealand’s local drug market. It may be that social media drug markets bring different drug market groups in closer contact than previously. But equally, they may help to facilitate an increasing diversification of local drug markets, which likely ties into the opportunities presented by the broader online drug trade. This paper explores this potential impact in the form of the intersection between darknet markets and local social media-facilitated social supply dynamics.

Darknet market trade and its overlap with social media drug markets

Research indicates that a large share of darknet market trade is likely destined for offline resale (Aldridge & Décary-Héту, 2016; Demant, Munksgaard, & Houborg, 2018; Pantoja et al., 2022). Based on quantities purchased and the size of seized drug parcels, researchers suggest that most transactions are destined for offline social supply or ‘social dealing’ contexts, rather than the wholesale market (Demant, Munksgaard, & Houborg, 2018; Pantoja et al., 2022). Aldridge et al.

¹⁸ In New Zealand ‘patched gangs’ refer to a range of different gang styles, all of which typically wear back patches. These include street gangs (e.g., the Mongrel Mob and Black Power – the two largest in the country), outlaw motorcycle gangs (e.g., the Hells Angels, Head Hunters, or more recently, the Comancheros and the Mongols), and LA-style street gangs (e.g., the Killer Beez) (Gilbert, 2013; Breetzke et al., 2022b).

(2018) argue that darknet market trading may lead to drug use among new groups of people who would otherwise not have accessed drugs through established local physical drug market channels. This may particularly be the case in geographically isolated countries with small populations like New Zealand, where the local availability and quality of popular drug types such as MDMA has historically been variable (Wilkins et al., 2017).

Whether darknet markets facilitate harm reduction outcomes for buyers and sellers has been the subject of considerable research attention, particularly in relation to their potential to reduce levels of street level drug market violence and seller victimization (Barratt et al., 2016; Bergeron et al., 2022; Morselli et al., 2017). Darknet markets host structural features that promote reliable behaviors on the part of both buyer and seller, such as dispute resolution services, feedback ratings, and reputation metric systems (Przepiorka et al., 2017; Tzanetakis et al., 2016). Darknet-sourced drugs are often associated with “quality” and potency, and this may be attributed to the importance of sellers ratings and reputation in these settings (e.g., Bancroft & Reid, 2016; Van Hout & Bingham, 2013). Analyses of online-purchased drug samples have confirmed some drug types may be of higher purity than samples bought offline (Caudevilla et al., 2016; van der Gouwe et al., 2017).

Demant, Munksgaard and Houborg (2018) contend that social media drug markets likely play a role in disseminating darknet-purchased drugs into local networks. Indeed, a growing body of literature suggests that different types of online and physical drug markets are seldom used in isolation from one another (Childs et al., 2020; Demant, Munksgaard, & Houborg, 2018; Sjøgaard et al., 2019). For example, in Denmark and Sweden, researchers have found considerable overlap between the use of darknet, social media and physical drug markets (Demant et al., 2019). The familiarity and accessibility of social media platforms (Moyle et al., 2019), and their proximity to people’s social networks, is likely to mean they become the “default” channels through which darknet sourced drugs are distributed into local drug market settings (van der Sanden et al., 2022a).

This paper aims to explore how social media platforms facilitate the expansion of local social supply networks and associated harm reduction impacts. As part of this endeavor, we consider how harm reduction impacts may be further extended by the inclusion of ‘darknet social dealers’ into these social supply drug markets.

Methods

This paper presents a qualitative analysis of anonymous interviews with people who use social media to buy or sell drugs in New Zealand. The study is part of a broader project considering the impact of social media and darknet drug markets in New Zealand (See also, van der Sanden et al., 2021; van der Sanden et al., 2022a; van der Sanden et al., 2022b). Online chat-based interviews (Bakken, 2022; Barratt, 2012; Gibson, 2022) were carried out from July 2020 to September 2021. In total, 33 people took part in interviews. We took a semi-structured approach to ensure interview questions were adaptable across a variety of different drug market roles (e.g., buyer/seller) and patterns of social media platform use. This approach also allowed us to be more responsive to any unexpected or novel issues and experiences raised by participants (Brinkmann & Kvale, 2015). The initial schedule was developed based on a literature review and the results of an earlier large-scale quantitative survey of people who purchase drugs via social media in New Zealand (van der Sanden et al., 2021). The schedule included a range of topics on how different platforms were used to buy or sell drugs, and perspectives on physical safety and drug quality.

We used the encrypted messaging app Wickr Me (referred to as Wickr throughout this paper) to carry out interviews. Several factors influenced this strategy, including the nature of the research topic, the anticipated difficulties of recruiting participants from a hard-to-reach population, as well as encouraging open disclosure by interviewees (Wilkerson et al., 2014). We anticipated that many of our interviewees would likely be young (e.g., <25). People in this age group often perceive communication via online messaging to be more 'relaxed' than in-person conversations with strangers, or phone calls (Barratt, 2012; Mason & Ide, 2014; Shapka et al., 2016). As such, we assumed that using a secure messaging platform such as Wickr, which enabled anonymous sign up, would help many participants feel safer and more comfortable sharing their experiences (Wilkerson et al., 2014). Wickr chats are end-to-end encrypted by default and automatically incorporate message timers (on many messaging platforms such as WhatsApp, Messenger and Telegram these need to be set manually), as well as allowing for usernames to be easily changed. This platform has been used in previous research with social media drug sellers internationally (Demant et al., 2019) and by surface web cannabis sellers and buyers (Childs et al., 2022).

We used a targeted sampling approach to recruit interview participants (Watters & Biernacki, 1989). Study adverts were posted across multiple social media platforms, and in paper-form at a dance music festival in Auckland (Lim et al., 2010). Social media adverts were posted to both Facebook and Reddit. The lead author (RV) approached the administrators of subreddits

specific to New Zealand and Facebook groups related to drugs like cannabis or psychedelics as well as dance music genres often associated with certain forms of recreational drug use (e.g., Forsyth et al., 1997; Ter Bogt & Engels, 2005) for permission to advertise the study via these channels. The New Zealand drug checking service *Know Your Stuff* also posted adverts for the study to their social media accounts on Facebook, Instagram, and Twitter. To participate, people needed to be aged over 16 and have some experience using social media to buy or sell drugs in New Zealand.

Interviews were completed online over several hours, or in some cases over several days (due to breaks between ongoing messages). The longest interview took five days to complete. RV used Wickr's desktop application to carry out the interviews. After completion of each interview, messages were copy-pasted into a Word document and formatted to remove participant usernames and other potentially identifying details. Participants were offered a supermarket voucher as reimbursement for their time. In addition to the 33 initial interviews conducted, 11 participants also took part in a follow-up interview (also via Wickr), which took place roughly six months after their initial interview. Follow-up interviews were carried out to further develop our understanding of social media drug markets in New Zealand. They provided an opportunity to clarify interpretations of existing data, as well as ask questions on additional topics that had emerged during the first round of interviews. For example, of relevance to this paper, several follow-up interviews involved interviewees who were involved in darknet social dealing and used social media platforms primarily to sell these drugs to "friends".

Data were analyzed thematically in NVivo using Braun and Clarke's Six-Step Thematic Analysis framework (Braun & Clarke, 2006, 2014, 2022). Initial coding frameworks were developed based on a combination of information from the literature review and findings generated from the first few online interviews. As data collection and analysis progressed, coding structures were further developed and refined. Initial analysis involved reading and coding interviews by hand based on descriptive data such as app types used for drugs, drug supply connections and seller types, as well as experiences of drug market risks and harms and reflections on drug price and quality. Memos were maintained for each 'code group', detailing developments in thinking and noting those interviewee experiences that were particularly central to the essence of the codes within the group. Concept- and mind maps were used to clarify relationships between codes, code groups and themes in preparation for the write-up of findings. We have opted to retain the original language used by participants in the interview excerpts presented below. In cases where slang terms are clarified, this is inserted into the excerpt in non-italicized parentheses. This research

received ethics approval from the Massey University Human Ethics Committee Southern A (application code: SOA 20/22).

Findings

Contextualization of sample

Twenty of the interviewees had only purchased drugs using social media, while a further 11 had both bought and sold drugs via social media and messaging apps. Twenty-two participants reported they had used social media and messaging apps primarily to buy drugs from people they knew or could access via shared social networks. These experiences included purchasing drugs via commercial sellers, but largely consisted of buying from and selling to “friends” and “friends of friends”. Seven participants reported purchasing drugs via the darknet for personal consumption, to supply friends, or for more commercial resale purposes. Two of these participants, whose experiences form the basis of our discussion on ‘darknet social dealers’, were involved in regular purchasing of drugs from darknet markets reportedly for the purposes of selling to people they defined as ‘friends’, or occasionally, ‘friends of friends’.

The median age of interviewees was 24 (IQR=19.5-26), with the youngest interviewee being aged 16 and the oldest 39. Ten interviewees identified as female, 22 male and one gender neutral. Most participants were located in New Zealand’s North Island (by region: 10=Auckland – NZ’s largest city and most populous region; 10=Wellington – New Zealand’s capital and third largest city), and ten in the South Island. Cannabis (n=25) was the primary drug type interviewees used social media to either access or sell, followed by MDMA (n=23), LSD (n=22) and ketamine (n=9). The drug types most often bought via the darknet among interviewees were MDMA (n=7) and LSD (n=5). The social media platforms most often used for drug trading among interviewees were Messenger (n=17), Snapchat (n=17), Wickr (n=16) and Discord (n=12) (See also, van der Sanden et al., 2022a).

‘Easy connections’: Accessing drugs via network ties on social media

The ease of accessing different drug types on social media was commonly cited by interviewees as an important advantage of using social media and messaging apps for drug trading. Drug accessibility and choice of product have previously been emphasized as particularly high in larger, competitive selling groups on Facebook, Messenger and Discord, among others (Bakken &

Demant, 2019; van der Sanden et al., 2022b). In our study, participants using social media primarily to purchase drugs via existing social networks also cited ease of access to different drug types (See also, Bakken & Demant, 2019).

Social media and messaging app communication affordances streamlined participant abilities to communicate with different people or groups simultaneously and across a range of different platforms. This dynamic allowed them to use a broader network of contacts much faster and more conveniently:

A simple message to the right person will get you into the “network” where everyone knows a guy ... social media has definitely made it so much easier. Even compared to when I first started with drugs to now, the difference is night and day. It used to be text a guy wait a bit. Nothing? Maybe try another guy who might have. (P8, M23, buyer/seller)

For the buyer, it’s so easy to snap/message a range of contacts in one go and see who is in stock and what they have and get a reply within the hour and usually get what you need within an hour or two. And you can pick and choose who you buy from a lot easier, as all suppliers products vary... Took out the guess work and inconvenience of getting your hands on anything. You get to the point meeting people and attending festivals and after parties that you end up with quite the contact list. (P24, M31, buyer/seller)

I used to buy through texting people. Would get names and numbers through word of mouth. I also used to go to tinny houses. Snapchat is sooo much easier and faster! (P28, F22, buyer)

The ease of maintaining large social networks on and across different social media platforms suggest the potential formation of a type of “social supply supernet” (Donath, 2007). Such networks could also be easily expanded by sending friend requests or exchanging Snapchat usernames. In turn, this could increase drug accessibility and purchasing speed within a drug market context that often involves collaboration with social contacts rather than commercial sellers.

Accountability and transparency in social network-based drug trading

Participants using social media to buy and sell drugs to ‘friends’ or social connections reported perceptions of security and physical safety in social media drug trading. Sellers felt they were at lower risk of being robbed or assaulted, while buyers felt buying via ‘trusted’ others provided protection against adulterated substances, consistent with findings in the existing social supply literature (e.g., Hathaway et al., 2018; Murphy et al., 2018). Friendship or mutually trusted ties were perceived to increase seller and buyer accountability to one another, and the transparency of the trade:

Discord is known for having people on it who are only on there to roll (rob) others but on Snapchat the dealers are pretty much 100 percent trustworthy since you always get them through other people. (P29, M19, buyer/seller)

Even if they're not super close, knowing who they are means if they sell you bath salts or something it'll get back to them and they'll lose customers/reputation, whereas some random FB page can just shut down and open a new one. (P27, M23, buyer/seller)

I'd also be more worried about the dangers of the substance (applies to MDMA/coke not weed) buying anonymously through social media as opposed to friends, as I'd trust my friends to not sell me something different or cut/laced but wouldn't necessarily trust strangers. (P13, F24, buyer)

My first choice is always someone I know. Mainly it makes me feel safer. I know it's completely my risk of taking drugs but there's a sense of "my friend won't sell me something dangerous or a dud" (P16, F26, buyer)

Importantly, several of the above excerpts highlight the ways in which participants often juxtaposed buying from people in their social networks on social media with the anonymity of sellers on platforms like Facebook, Discord, or dating apps who use fake accounts. Participants often appeared to perceive the latter type of social media seller as particularly unaccountable. In these contexts, the information contained in a seller profile was viewed as unreliable and potentially misleading. These perceptions can be argued to reflect the lack of discernible personal information contained in fake or pseudonymous accounts, and the difficulty of “anchoring” these sellers in visible, offline social networks (Zhao et al., 2008). In turn, this influenced participant perceptions of the transparency of drug trading outcomes:

You're really only able to judge a dealer's character through their messages/social media profile, could be far more dangerous than what you think. (P32, M19, buyer/seller)

You never know who is genuinely at the other end... Like one (profile on Facebook) was delivery. And I was like man do I want this person to come to my house? (P11, M31, buyer)

But also just like you don't necessarily know if the person you're dealing with has gang ties or anything (P15, F31, buyer/seller)

An anonymous profile or page is easily created on platforms like Snapchat and Instagram, and these sellers could leverage communicative affordances to market their products more widely and effectively to a broader range of potential buyers. However, the low accountability and lack of transparency participants attributed to this type of seller could be interpreted as illustrating a crucial tension between the adaptation of visibility and association affordances to facilitate anonymous drug trading within a local drug market context, which remained rooted in physical transactions. Conversely, the way visibility and association affordances were appropriated in “social supply supernets” was a core element in facilitating participant engagement with a broader, yet more transparent and low risk local drug market context.

The use of platform affordances to “anchor” drug trading relationships in offline social networks

Social connections were both easier to locate on social media platforms, and easier to connect with via ‘friending’, ‘adding’, ‘following’ or ‘messaging’. The traditional process of ‘vetting’ prospective buyers and sellers through already-trusted parties continued to form the basis of drug trades in social media drug market contexts (See also, Bakken & Demant, 2019; van der Sanden et al., 2022a). This ‘traditional’ process of establishing trust in ‘closed’ drug markets (May & Hough, 2004) was complemented by visibility and association affordances, which increased the amount of personal information people could access and use in forming judgements of potential drug contacts:

*Its sorta weird messaging "C*** B***" who has a pfp (profile picture) of him and his girlfriend at a nightclub and he "Went to school at Rangitoto College". (P12, GD25, buyer/seller)*

The participant above describes the additional information communicated as part of a drug trade with a distant social connection on Facebook by virtue of their public profile. Some participants referenced the use of this type of visible information to supplement existing 'vetting' procedures, or alternatively to seek information on prospective drug connections one or two steps removed from their own personal networks:

Found the dude's Facebook, we had a mutual (friend). Hit the guy up asking about his character... (P15, F31, buyer/seller)

I just mainly judge them by appearance and who they are friends with, what they post about. If I see them flaunting aggression or gang related material I steer well clear. Also can usually tell a fake profile a mile away as well. (P24, M31, buyer/seller)

Both excerpts highlight the ways in which people's broader social media presence, including public profiles, and visible social networks served as avenues by which prospective drug connections could be investigated. The quote from P24 also highlights the importance of judging the overall 'authenticity' of an individual's social media profile, or whether a person's social media presence reflected their offline identity by drawing on a range of available online cues. In turn, this provided a means of "anchoring" people more firmly in their respective social contexts (Zhao et al., 2008), and therefore a firmer basis on which to make judgements around who was trustworthy.

Platform features that increased the visibility of personal information and facilitated association with others were complemented by the communicative affordances of messaging apps, which enabled the formation of group chats encompassing an extensive range of social connections specifically for drug trading purposes, as described by the participant below:

I've also been added to group chats (on Snapchat and Whatsapp). It's a variety of friends and friends of friends, etc. and people I trust... It's a melting pot of people... these are people I have met at least once either in a club, party, through work, etc who I trust very well. So I don't get attacked or get cut products. (P31, M24, buyer/seller)

In these instances, different trusted group members brought together their own trusted ties, streamlining the procedure of 'vetting' through mutually trusted contacts. The group-chat function provided the ability to easily bring together different social networks – association affordances – to facilitate the creation of mutual trust between people who were likely to have been too socially distant to connect otherwise. Haythornthwaite (2005) refers to this dynamic as

the 'activation of latent ties'. This created an expanded 'social dealing' network through which drugs could be opportunistically bought and sold:

When I come across stuff to sell I put a message out what and how much and the price. And if I want to buy I send out a message too if anyone has anything etc. And they to the same etc. (P31, M24, buyer/seller)

Taken together, an increased ability to "anchor" people in their offline social networks (Zhao et al., 2008), and the ease with which social networks could be expanded on social media indicated the potential to extend social supply and 'social dealing' networks beyond what would have been possible offline. In turn, this expanded networking ability also allowed participants to encompass a wider range of potential drug connections under a more 'friendship' oriented, less formal drug market structure, increasing the transparency of drug trades and the accountability of network members to one another:

Yeah 100% makes things a lot easier, when I first started years ago, it was very dodgy, you never knew who u were buying/selling off/too just word of mouth and dodgy tinny houses with undesirables at the other side of the door. Social media has made a huge impact on ease of sales, with less risk and a broader market. (P24, M31, buyer/seller)

Darknet drug supply and social media 'social dealing'

Two participants, P9 and P27, reported instigating 'darknet social dealing' by virtue of their computer skills, and an ability to access a range of drug types at affordable prices and reliable quality without a need for prior connections to local offline suppliers. Both participants purchased large amounts of drug types such as LSD, MDMA and ketamine on the darknet then resold them via messaging apps to people they described as 'friends'. P9 described his trajectory into this type of social dealing arrangement:

[I] had heard plenty of horror stories from my friends about sourcing drugs when they were younger, dodgy dealers and dodgy substances. I'm rather talented with computers and managed to find my way onto the darknet markets pretty easily, where the quality and the price was incredible, and super easy to make a profit off of. So I started buying off the darknet, and selling to friends, in which case using

messaging apps came in very handy, especially with the secure/disappearing nature of them. (P9, M29, buyer/seller)

In this excerpt, P9 frames his involvement in 'darknet social dealing' as providing an *alternative* to engagement with what he perceives as the local drug market status quo, involving "*dodgy substances and dodgy dealers*". The framing of social supply or 'social dealing' as a 'service' provided to friends is well-established in the drug market literature (Jacinto et al., 2008a; Jacques & Wright, 2015). Additionally, the size of these 'darknet social dealing' networks could be considerable (See also, Taylor & Potter, 2013), encompassing the supply of other "*dealer friends*" (P27 – see below) and their respective buyers, with connections spread across different platforms and apps:

Wickr there's only 2 or 3 (people), Telegram I've got a group chat which has like 10 people in it... Snapchat I only use for mostly buying weed off one guy. There's a couple of contacts I could go to if I needed to there. I've got on person I message on Signal... Then Messenger secret chats would be everyone else I know who wants to buy stuff. So like 20-50 people on there I guess. (P9, M29, buyer/seller)

I would say 10-20g (of MDMA) to mates, 25-50g to dealer friends, the rest on Tor (NZ darknet market). But I've been splitting the packages 50/50 with one friend so I get 125g per package, so 70-90ish on Tor I guess. (P27, M23, buyer/seller)

The inclusion of 'darknet social dealers' in what were often already extended social supply networks could be viewed as adding an additional element of 'separation' between these networks and other local physical drug market spaces. As a result, 'darknet social dealing' appeared to extend the buffering effect researchers have suggested social supply has on young people's interactions with commercial drug markets (Coomber & Turnbull, 2007). 'Darknet social dealing' networks could be viewed as affording their members greater control over how they interacted with their local drug market, making unwanted engagement with more 'high risk' seller types (e.g., gang-affiliated sellers) a more avoidable part of drug trading. This dynamic was to some extent mirrored by the seller's own separation from other local drug supply channels:

Someone I know heard through the grapevine that a [local] gang was asking about who this new person selling was since somehow that made it back to them via some friend of a friend buying, so that spooked me a bit, so no more of that 😊. (P27, M23, buyer/seller)

The potential for the darknet market to reduce barriers to commencing drug selling, and its subsequent harm reduction impacts when coupled with the convenience of social media and messaging apps as a point of access to local social networks is summarised in the excerpt below:

[social media] made it easier for the average Joe to sell and buy rather than just gang members or undesirable people... compared to the people I used to buy off 10 years ago to who I can buy off now, the ability to get anything off the dark web has made it possible for anyone who wants to take the risk to do it. (P24, M31, buyer/seller)

Discussion

Our findings suggest that social media and messaging apps provide the opportunity to widen the social networks available to draw on for buying and selling drugs to create “social supply supernets” (Donath, 2007). We suggest this may have the effect of increasing buyer and seller capacity to transact in ‘low risk’ drug markets based around the extension of many of the norms of social supply and ‘friendship’. We suggest that a core factor underpinning the potential for harm reduction in these spaces is their use of platform visibility, association, and communicative affordances to more effectively and broadly “anchor” people in offline social networks and relationships (Zhao et al., 2008). This ability in large part rests on the centrality of offline social connections and networks to social media engagement. Within this expanded social supply landscape, the use of darknet markets to purchase drugs for offline resale to ‘friends’, often via social media and messaging apps, may serve to further close off these networks from local, commercial physical drug market contexts.

We have previously observed that it is important to appreciate that social media and messaging platforms are not specifically designed to facilitate drug trading (van der Sanden et al., 2022a). In this vein, how people adapt platform affordances to facilitate drug transactions may feed into social media harm reduction impacts. These impacts are to some extent underpinned by the complex relationship between platform affordances and their adaptation to different actions, behaviors, and contexts, or the ways in which platforms *resist* and *support* user action (Davis, 2020). In this paper, interview participants engaging in social supply using social media or messaging apps used visibility and association affordances (e.g., public profiles, visible mutual friends) to facilitate and *extend* trust across social connections once, or twice removed from their own networks. “Social supply supernets” were in large part enabled because participants were using these platform affordances in a context which may have more closely resembled the design intent behind their integration into platform infrastructure – the re-creation of *offline* social

networks and connections *online*. As a result, participants could appropriate a platform infrastructure designed to facilitate the building and maintenance of large social networks to similarly expand a drug market context already characterised by greater security. The ability to “anchor” others in offline social networks and seek out additional information sources made it easier to broaden social supply networks while keeping drug market harms such as victimization or receiving adulterated drugs to a minimum. The usefulness of “anchored relationships” to social media drug trading may be particularly important given that many of these dynamics appear to be predominantly local in scope (Moyle et al., 2019). As a result, social media drug markets occupy a type of hybrid online/offline drug market space within which pseudonymity may be difficult to manage without increasing the potential for drug market harms such as victimization.

Participants often equated anonymous seller profiles with greater potential for drug market harms such as drug adulteration. These perceptions to some extent reflected the limited personal information on a selling profile, and limited ability for onlookers to “anchor” (Zhao et al., 2008) the seller in a particular local social context. However, as part of more anonymous social media drug markets buyer and seller may adapt platform visibility, association and communication affordances to function as sources of information around trustworthiness in the absence of an ability to “anchor” others in local social networks. For example, research by Bakken (2020) has explored how social media drug sellers on Facebook construct fake profiles in a manner that conveys information about themselves and their operation to prospective buyers using professional or subcultural cues (visibility and association affordances). Additionally, McCulloch and Furlong (2019) have emphasized the potential for buyers using anonymous sellers on social media to gather information by looking at factors like the number of account followers (association affordances) and examining their posts and profiles (visibility affordances) and comments left from previous buyers (communication, association, and visibility affordances). The latter dynamic indicates a type of informal ‘review system’, which has been documented as commonplace on more anonymous, competitive social media drug markets, providing buyers and sellers with a pathway to reducing the potential for victimization in these contexts (Bakken & Demant, 2019; van der Sanden et al., 2022b).

Findings presented in this paper also provide some insight into the interplay between darknet market and social media drug trading. They provide support for the argument that darknet markets may ‘democratize’ drug market entry, by removing the need for prior connections to local suppliers (e.g., Aldridge & Decary-Hétu, 2016; Martin, 2018). Our findings suggest the combination of darknet drug supply and social media drug trading could provide a source of local drug market diversification, enabling buyers and sellers a greater level of choice in

how and with whom they transact. However, we also point out that these ‘darknet social dealing’ networks may raise questions around local drug market ‘gentrification’ (Martin, 2018). For example, the normalization of social supply (Coomber et al., 2016) is tied into the rise of ‘acceptable’ or ‘sensible’ recreational drug use around drug types such as cannabis, MDMA and psychedelics among some population groups in western countries (Chatwin & Potter, 2014; Jacinto et al., 2008a). These more ‘normalized’ drug types are also among some of those most often purchased via darknet markets (e.g., Kruithof et al., 2016). Furthermore, both of the ‘darknet social dealers’ featured in this paper broadly fit the demographic characteristics linked to darknet buyers (white, <25, male, most likely recreational users or ‘psychonauts’, tech-savvy) (e.g., Barratt et al., 2016; Van Hout & Bingham, 2013). These demographic and drug use attributes are likely to influence the types of local groups who benefit from ‘darknet social dealing’. As such, the harm reduction impacts of this increased local drug market diversification may be limited to those demographics and drug using groups who are already less likely to experience drug market harms, such as exposure to arrest or violent victimization (e.g., Jacques & Wright, 2015; Mohamed & Fritsvold, 2010). This is in line with what Martin (2018) has suggested is the low likelihood for ‘low violence’ digital drug supply channels like darknet markets to meaningfully reduce drug market harms in more volatile local drug market settings. There remains an absence of research on the differential impact of social media drug markets, particularly how platforms may be used to facilitate transactions in more high-risk local drug markets for drug types such as methamphetamine.

Finally, a climate of increased drug availability on social media must be understood as interlinked with the presentation of drugs on social media more generally. Easily accessible online content and information (e.g., Barenholtz et al., 2021), alongside targeted content and adverts (e.g., Bol et al., 2020), underscore the potential for increases in substance misuse, particularly among younger age groups. These factors are likely to have considerable harm reduction implications not discussed in this paper. Oksanen et al. (2021) have identified a link between online drug purchasing and young people who may be more vulnerable to developing patterns of drug misuse. As such, the impact of social media drug availability on trajectories and patterns of drug use is an important topic for future research.

Limitations

This research is based on a small sample of people who use social media to buy and or sell drugs in New Zealand. New Zealand has a somewhat unusual drug market by international standards,

reflecting geographic isolation and a small population, which manifest in relatively low availability and quality and high prices for drug types like MDMA and LSD (Wilkins, Romeo, et al., 2018). This may impact the generalizability of our findings to the wider understanding of the drug markets in other countries. On a similar note, our findings around ‘darknet social dealers’ may also reflect New Zealand’s unique drug market context; darknets may provide a particularly important supply avenue to supplement limited local drug availability in New Zealand via traditional smuggling routes (Moss-Mason, 2019). Many of our participants were primarily buyers, whose knowledge of drug supply, selling and drug networks may therefore be limited.

There is great variation in social media platform features and how people use them to reveal or hide personal information (e.g., setting profiles to private on platforms like Facebook or Instagram, or turning off ‘quick add’ on Snapchat). Not all people will engage with these features in the same way, if at all, as part of social media drug trading behaviors.

Conclusion:

We have suggested that the use of social media and messaging apps to expand drug access via established social networks facilitates the development of extended “social supply supernets”. We argue this allows buyers and sellers to leverage an expanded and more secure local drug market network where risks such as adulterated substances and victimization may be reduced. The potential for harm reduction from this type of social media drug market may reflect a higher degree of platform *support* for drug trading behaviors based on extended social networking with people one already knows. On social media, features such as public profiles, and visible ‘friends’ or ‘followers’ networks can be used to “anchor” people in their respective offline social contexts. In turn, this increased transparency means that drug transactions can be more easily and broadly embedded in ‘friendship’ norms emphasizing reciprocity and benevolent trading behaviors. We suggest that the addition of ‘darknet social dealers’ to this expanded social supply dynamic may increase the extent to which social supply serves to buffer network members from physical drug markets and violent competition and victimization. This paper points to the potential of social media and messaging apps to expand both the breadth of social supply and its associated harm reduction benefits.

Chapter 10: Discussion and conclusions

This thesis has explored the use of social media and messaging apps to buy and sell drugs in New Zealand using a mixed methods approach combining survey data with messaging-based online interviews and observational data collection. In this final chapter, I bring together findings presented in Chapters 5 through 9 to discuss their implications for understanding social media drug markets in New Zealand and internationally.

This discussion is divided into three sections, each of which corresponds to one of the research objectives presented in Chapter 1 (Section 1.4). To begin, Section 10.1 discusses how study findings contextualise the phenomenon of social media drug markets in New Zealand by considering the way they illustrate the increasing interrelationship between global and local, and digital and non-digital, drug markets. Subsequently, Section 10.2 considers this study's contribution to understanding how social media may impact young people's engagement with their local drug markets, with particular emphasis placed on findings around social supply. Section 10.3 presents a discussion of the interdisciplinary implications of the research findings, with a focus that considers how the hidden complexities of the broader social media landscape and people's engagement with it may impact social media drug trading. From here, Section 10.4 presents a summary of practice and policy implications, followed by Section 10.5 discussing research limitations. Finally, Section 10.6 outlines future directions for the study of social media drug markets, both in New Zealand and abroad.

10.1 Online and offline drug markets in New Zealand: Diversity and convergence

Findings from Chapters 5 to 9 provide insight into the increasingly blurred boundaries between digital and non-digital drug markets in New Zealand. Local drug market and social media contexts continue to influence the emergence of diverse digital drug market dynamics. However, local drug markets may also increasingly face a certain level of homogenisation – or convergence (Jenkins, 2006) – as they incorporate digital technologies that operate on a global scale. In this Section, I consider the study findings illustrating these two parallel influences on social media drug markets

in New Zealand. Section 10.1.1 underscores how global trends in social media drug markets are shaping this phenomenon in New Zealand. From here, Section 10.1.2 considers local diversity and the novel social media drug market trends that have emerged in New Zealand during this study, with particular emphasis on Discord drug servers. Finally, Section 10.1.3 discusses the intertwining of darknet drug supply with social media drug markets, and the potential implications for local drug markets in New Zealand.

10.1.1 Global influences on social media drug markets in New Zealand

At a macrolevel, the global reach and userbases of social media platforms like Facebook, Instagram, and Snapchat and messaging apps like WhatsApp and Messenger are likely to engender increasing homogenisation across different drug market contexts. This potential outcome does not negate the continued importance of culture, social, and drug market contexts in shaping social media drug trading (See Section 10.1.2). Rather it reflects a certain level of homogenisation likely to result from the global centrality of digital engagement to day-to-day life, alongside the spread and entrenchment of a small group of social media platforms across different social groups, and therefore also across different drug market contexts.

In this study, many of the local social media drug market dynamics bear significant resemblance to social media drug market trends already identified and explored in international contexts. Platforms commonly used for drug trading internationally, such as Snapchat and Facebook (including Messenger), are also widely used in New Zealand, albeit with some local variation. For example, Facebook (including Messenger) was most often used for drug trading among NZDTS respondents (60%), followed by Snapchat (48%) and Instagram (20%). Notably, though Moyle et al. (2019) found the same platforms were used for drug trading among their survey respondents, Snapchat was the most widely used by a significant margin (76%), followed by Instagram (48%) and then Facebook (22%) (Chapter 5). These overlapping findings around platforms and apps used for drug trading are unsurprising, given what has already been articulated in existing social media drug market research as the convenience of using a technology that is both familiar and used by a large proportion of the population (Demant et al., 2019; Moyle et al., 2019). In this study, the importance of these factors is illustrated by findings reported in Chapter 7. Interview data presented in this chapter demonstrated that the “taken for grantedness” (Ling, 2012) of mainstream day-to-day digital communications architecture, in this case New Zealand’s ‘default’ messaging app Messenger, has similarly contributed to a ‘natural’ progression to its adoption for drug trading behaviours.

The continued use of a core group of platforms across different drug market contexts highlights the positioning of international drug trading behaviours within a similar environment of platform affordances (Chapters 7, 8, 9). As such, drug markets in different contexts may be increasingly likely to make use of the same platform features in similar, albeit locally inflected ways. A notable example of this is the use of social media platforms and messaging apps to facilitate competitive selling group dynamics in New Zealand (Chapter 6). Bakken and Demant (2019) describe similar drug selling dynamics on Facebook in Denmark and Sweden, while Blankers et al. (2021) document this trend on Telegram in the Netherlands. In this study, though interview data indicated the presence of Facebook and messaging app selling groups in New Zealand, both interview and observational data focused heavily on Discord, which represented an emerging, local social media drug market trend during the study period (See Section 10.1.2, and Section 10.5 presenting study limitations). In New Zealand, the emergence of public (Bakken & Demant, 2019) social media drug markets centred around quick local pick up or delivery and choice of buyer and seller could be suggested as facilitating a locally novel drug market dynamic.

In Chapter 1 I discussed the absence of historical evidence of large, open street-type drug markets in New Zealand, highlighting what may be the role played by a small, geographically dispersed population in making this type of drug market particularly visible and hard to sustain on a large scale. In this vein, social media and messaging apps that allow the formation of digital groups or community spaces (e.g., Discord servers, Facebook groups, Messenger, or WhatsApp groups, etc.) may provide a digital environment conducive to enabling this type of open drug trading dynamic in New Zealand. In the current study, this type of social media drug market was often used to access more 'popular' drug types such as cannabis, MDMA and LSD. Historically, these drug types have often been sold from locations such as closed drug markets like private houses (Wilkins et al., 2004), or open drug markets such as tinny houses (Wilkins et al., 2005), both of which limit the choice of easily accessible product, buyer, or seller. In contrast, interview and observational data evidenced Discord drug servers as bringing together different sellers and product types within one, accessible marketplace, allowing members to 'shop around' their local drug market more conveniently and quickly (Chapter 6; See Section 10.2.1 for further discussion).

Similarities in New Zealand social media drug market dynamics and those documented internationally also indicate potential for similar impacts on drug market engagement and purchasing patterns, particularly among younger age groups. For example, in this study, both survey findings (Chapter 5) and interview and observational data (Chapter 6) showed an association between social media drug markets and more commercial seller types (i.e., NZDTS survey options of "drug dealer" or "gang seller"). These findings are notable given existing

research suggests social media drug markets may accelerate young people's movement into commercial drug markets (Demant & Bakken, 2019; McCulloch & Furlong, 2019). The implications are discussed in more detail in Section 10.2. However, on broader scale these complementary quantitative and qualitative findings may evidence some similarities between social media drug trading impacts in New Zealand and internationally. These similarities are notable given significant historical differences between the New Zealand drug market and those of larger, more densely populated countries (Chapter 1, Section 1.2).

10.1.1.1 Online content and normalisation

Social media drug trading in New Zealand is interwoven with the global scope of both digital communities and content. This broader digital context is an important backdrop against which the findings of this study are explored. Akin to suggestions made by other researchers (Demant & Bakken, 2019; McCulloch & Furlong, 2019), study findings indicate that normalisation of certain forms of drug use is likely to be a factor underpinning social media drug market development in New Zealand. In turn, easy access to drugs via day-to-day social media channels is likely to play a role in increasing normalisation. This broader 'climate' of normalisation is linked to the accessibility of drug-related digital content such as meme pages, informative websites, and drug-related digital communities on forums, subreddits, and Facebook groups for example. These communities can become sources of drug access, particularly if they are local, as evidenced by interview data on the use of Discord drug servers, where drug-related subreddits served as a notable source of drug server invite-links (Chapter 6). However, regardless of whether these spaces are used as points of access to buyers or sellers, their accessibility and 'openness' provide evidence of the increasing normalisation of certain forms of drug use in particular digital settings. In turn, this broader digital context may play a role in facilitating the spread of social media drug markets.

In the qualitative part of this study, a large share of interview participants were young people primarily engaging with social media drug trading in a context shaped by social supply (See Section 10.5 for limitations). These sample characteristics are likely to mean that many interview findings illustrate a broader context of social media drug market engagement that may be closely tied to perceptions of certain types of drug use as 'normal'. This link reflects the normalisation of social supply behaviours as part of a broader context of recreational drug use (Coomber et al., 2016; Hathaway et al., 2018). Findings drawn from interview data in Chapters 6 to 9 evidence perceptions of normalisation around recreational drug use as a shaping factor in social media drug trading. For example, normalisation was a factor underpinning the unconscious shift to using apps

like Messenger for small-scale drug trades between friends (Chapter 7), given established practices of using such channels to discuss drugs and drug use (e.g., George et al., 2019). Low risk perceptions around law enforcement (Chapter 8) could also be linked to normalisation, shaping the types of platforms and online security measures that participants deemed adequate given their perception of themselves as ‘small fish’. Similarly, survey and interview findings in Chapters 5, 7 and 8 all evidence the high priority afforded to convenience in the social media drug market model, a dynamic similarly noted by Moeller (2022) and Moyle et al. (2019). These points of overlap may indicate broader trends of lowered risk perceptions around participation in retail-level drug markets in line with greater normalisation.

However, increasing recognition of the tailoring of social media content to individual users (Bol et al., 2020) and the potential for this dynamic to help facilitate echo chamber effects¹⁹ (Cinelli et al., 2021), may also amplify differential normalisation dynamics (Shildrick, 2002; Williams, 2016). Differences in how people are exposed to social media and drug related content may mean that normalisation *deepens* among groups already involved with or interested in drug use, while decreasing normalisation among those with other interests. Hence, though social media drug trading and drug-related content may expand normalisation dynamics across groups of people who use drugs, whether normalisation increases among young people more broadly is less clear.

10.1.2 Continued local drug market diversity in New Zealand

Despite the commonalities documented between social media drug trading in New Zealand and international findings, this study also illustrates the continued importance of local context in inflecting how these spaces emerge. The findings highlight an interdependence between local drug market contexts, and local patterns of social media engagement as a shaping factor for social media drug trading (Chapters 5, 6 and 7). In doing so, this research builds on existing social media drug market research indicating the relevance of geographical variation in social media drug trading dynamics and patterns of platform and app use (Demant et al., 2019; Moyle et al., 2019).

As aforementioned, Chapter 6 presents a case-study of Discord drug servers, a social media drug market phenomenon in New Zealand that has not been documented internationally, aside from a media report on drug servers operating in South Australia (James, 2021). It is probable that drug servers are in use in other country contexts despite a lack of documentation.

¹⁹ Cinelli et al. (2021) define a social media echo chamber as a digital environment in which a user’s perceptions, and opinions are continually reinforced by virtue of repeated interactions with others, sources and content promoting similar attitudes and beliefs.

However, their emergence in New Zealand raises questions around why they appear to have grown rapidly in popularity, particularly in the Wellington region (McKenzie, 2022), and how their use will evolve in the future. It remains unclear whether the Discord platform is rising in popularity in New Zealand generally, as statistics on local engagement have only recently emerged (See Section 2.2). Discord's emergence as a drug market during the study period may reflect the disruption caused by the COVID-19 pandemic and subsequent lockdowns throughout New Zealand to some extent. This sudden change to people's daily practices and routines may have played a role in facilitating the spread of drug servers as convenient and feasible alternatives to established drug market connections, which may have been less viable during this period (e.g., McKenzie, 2020). Indications of similar increases in engagement with digital drug markets, including social media and messaging apps, were reported in Europe during the pandemic (EMCDDA, 2020; Groshkova et al., 2020). Additionally, subsequent media coverage of drug servers likely played an additional role in increasing public awareness, and subsequently also drug server popularity, particularly among younger age groups. However, whether drug servers remain popular given many have since shutdown (Chapter 6) is unknown.

As evidenced by interview and observational data in Chapter 6, the technical potential of Discord as a marketplace ultimately also proved challenging to reconcile with what were diverse physical local drug market contexts and dynamics (See Section 10.3.2). Discord drug servers illustrated what Demant et al. (2020) have suggested is social media's potential to act as "digital mortar" by mixing different seller types and drug market contexts. This was particularly the case on "lower tier" drug servers, where it was often difficult to understand how other server members were positioned within local drug market networks. This factor greatly exacerbated drug market transaction risks such as scams and victimisation (See Section 10.2.3). In the New Zealand context, "lower tier" servers arguably brought members into contact with local drug market supply channels and networks they would ordinarily have been unlikely to interact with, such as gang members or gang-affiliated sellers (see Appendix J for examples of observational data collected from "lower tier" drug servers). In this vein, "lower tier" Discord drug servers provided evidence of the influence local, non-digital drug markets could have on digital drug market dynamics, and vice versa – how digital drug market dynamics impacted on non-digital, physical drug trades.

10.1.3 The darknet market-social media axis and its implications for local drug markets

This study has also provided insights into how different forms of digitally mediated drug supply intersect in local drug market contexts. Here, overlap between darknet market drug supply and social media drug markets is explored as part of Chapter 9 using interview data. Interview findings highlighted the potential for the interweaving of darknet market and social media drug supply networks to facilitate a diversification of local drug markets in New Zealand. These findings support what Moss-Mason (2019) found to be significant overlap between darknet market drug purchasing and the social supply of drugs among her interview sample (N=12). Additionally, they provide support for what researchers have suggested is the likely ‘intermediary’ role played by social media and messaging apps as familiar, easy-to-use technologies in comparison to the complexity and continued nicheness of the darknet market (Blankers et al., 2021; Moyle et al., 2019).

This study adds to nascent understanding of the interrelationship between these digital drug markets by illustrating the overlap between darknet drug trading and social media drug markets in the context of ‘darknet social dealing’. As reported in Chapter 9, interview data evidenced how social media and messaging apps became the channels through which darknet-sourced drugs entered local drug market contexts and social networks (see also, Demant et al., 2019). This ‘trickle down’ effect highlights the ways in which digital and non-digital drug market contexts have become increasingly interwoven in New Zealand. These findings are notable in the context of this study because they highlight an opposing dynamic to the mixing of local drug market contexts discussed previously in relation to “lower tier” Discord servers. Instead, the darknet market-social media axis and its relationship to social supply and social dealing served to ‘separate’ these networks from existing local drug supply channels (See Section 10.2.3). This finding also has implications for the second key contribution this research makes to developing a more nuanced understanding of young people’s engagement with different seller types as part of social media drug trading.

10.2 Social media drug markets and their impact on young people's drug trading behaviours

The thesis has explored both more and less commercial social media drug markets in New Zealand. Research findings reveal different drug market dynamics, highlighting the potential for diverse impacts to result from engaging with social media drug markets across different drug market contexts. The issues and potential impacts of social media drug markets in New Zealand discussed in this section can be linked back to Chapter 5, where statistical modelling of survey data helped shape the direction of subsequent qualitative interviews and analysis. Chapter 5 indicated the concentration of social media drug purchasing in New Zealand among younger age groups and linked the use of social media drug markets with an increased likelihood of purchasing from a commercial seller type (e.g., the fixed list options of either a “drug dealer” or a “gang seller”) and viewing several drugs as ‘easy to get’. Taken together, survey findings indicated the potential for young people in New Zealand to access both drugs and a commercial drug market environment more easily via social media (See also, McCulloch & Furlong, 2019; Moyle et al., 2019). Notably, only 4 interview participants were aged over 30, and the median age of the sample was 24 (IQR 19.5-26). Both interview and observational data provided qualitative evidence of the potential for social media drug purchasing to result in increased exposure to commercial sellers. This dynamic was particularly strongly evidenced in relation to “lower tier” Discord drug servers (Chapter 6). Meanwhile, Chapters 7 and particularly 9 used interview data to explore the continued relevance of social supply behaviours to local drug market contexts, and the potential for expansion of this drug supply dynamic on social media.

In this section, I synthesise these findings to discuss their implications for a broader understanding of social media drug markets and their potential impacts on drug trading dynamics, with particular focus on younger age groups. I begin by briefly outlining the relationship between social media drug markets and perceptions of increased drug accessibility (Section 10.2.1) as a foundation for a subsequent discussion of commercial and social supply social media drug trading behaviours (10.2.2). Finally, I consider the harm reduction implications of study findings (10.2.3).

10.2.1 Social media drug markets and perceptions of greater drug accessibility

Both survey and interview findings provide evidence in support of an association between engaging with social media drug markets and perceptions of greater, or ‘easier’ drug accessibility (Chapters 5, 6 and 9). For example, descriptive survey data results indicated “convenience” (74%),

“fast delivery/transaction speed” (43%) and “ease of use compared to the darknet” (41%) were the most often selected advantages of social media drug purchasing (Chapter 5). As stated in Section 10.1.1, in drug selling groups such as Discord drug servers, perceptions of drug accessibility reflected what interview participants cited as convenient, and quick access to a range of buyers, sellers, and products (Chapter 6). This data was supported by observations of Discord drug server activity, particularly the range of sellers and products advertised in selling channels and the frequency with which adverts were posted. However, participants in closed and social supply networks similarly cited perceptions of easy drug access by virtue of a streamlined ability to accumulate contacts and network across different groups, as discussed in Chapter 9 (See also, Bakken & Demant, 2019).

The relationship between social media and messaging apps and perceptions of greater drug accessibility is the result of a combination of multiple factors. Firstly, the portability of the smartphone, and an ability to send, receive and respond to messages continuously plays a role in facilitating flexible, dynamic buying and selling practices. This factor resembles a similar advantage of text/call-based mobile drug markets, which allow buyers and sellers to maximise the personal convenience of a transaction (e.g., Curtis et al., 2002; Fader, 2016). Secondly, platform features facilitate streamlined social networking with other local drug connections, buttressed by high rates of social media engagement among New Zealand’s population (and globally) (See Section 10.1). An increased ability to network in local drug markets is what distinguishes social media drug markets from their text/call-based mobile counterparts, where seller contacts had to be collected manually, and communication between seller and buyer was often slower, more costly, and dyadic (i.e., one-to-one). Finally, the sheer diversity of user generated content (UGC), which can be leveraged across different social media and messaging apps, and the in-built nature of many useful features like self-deleting messages reduces the amount of planning, effort and consideration needed to organise a drug transaction securely (though this thesis also argues that perceptions of social media as ‘easy to use’ may oversimplify engagement with this environment – See Section 10.3). These overarching characteristics of social media and messaging apps can be used in the service of greater, more streamlined access to both commercial and less-commercial seller types (See also, Bakken & Demant, 2019).

10.2.2 The continued importance of social supply

Chapter 5 established an association between social media drug purchasing and the use of commercial sellers, drawing on an analysis of a large survey sample of people who purchase drugs

from social media and messaging apps across New Zealand. As such, interview data illustrating the continued importance of social supply do not negate the increased likelihood that social media drug markets may push younger age groups towards commercial seller types (See Section 10.5 presenting limitations). Rather, interview findings indicate an undercurrent to social media drug trading that may be overlooked by researchers and research participants alike because of the different perceptual framing of social supply in contrast with commercial drug markets. This was evidenced as part of Chapter 7, which reported that many interview participants did not ‘count’ social supply as social media drug trading. This perceptual separation often reflected a) the lack of interaction with someone they defined as a ‘dealer’; and b) a lack of engagement with social media or messaging apps that were viewed as ‘linked’ to a commercial drug market context (e.g., Discord, or encrypted messaging apps like Wickr). Neutralisation-based perceptual framing of social supply behaviours is well documented in the existing literature (e.g., Bright & Sutherland, 2017; Jacinto et al., 2008a; Jacques & Wright, 2015), and may therefore also impact the underrepresentation of social supply in current research on social media drug markets.

One methodological implication for future research on social media drug trading is the need to more explicitly consider how survey questionnaires or study information sheets frame the use of social media for drug trading in relation to the aims of the research. This consideration is particularly important if researchers aim to capture social supply behaviours as they take place using social media and messaging apps. For example, not all NZDTS survey respondents equated social supply using social media or messaging apps with purchasing from a social media ‘location’. As such, one of the more frequently occurring NZDTS respondent entries in the open text field accompanying the survey question on perceived advantages of social media purchasing was ‘easy to message friends’ (See Appendix C). Of the 162 open text field entries for this question, 44 responses related to this theme²⁰. A similar dynamic characterised some of my recruitment of interview participants. In these instances, prospective participants interpreted themselves as ineligible to take part in the research on reading the information sheet. This perception often reflected how the social nature of their drug market relationships overshadowed or obscured engagement with social media or messaging apps as part of social supply transactions.

Chapters 7 and 9 illustrated a continued preference for transacting with friends, or social acquaintances among interview participants, similar to findings from Moyle et al. (2019). Participants also indicated simultaneous use of social supply connections alongside more

²⁰ Other frequently occurring themes related to general convenience and social media as a contemporary ‘default’ mode of communication (n=54), and perceptions of increased safety and community (n=38), as listed in Appendix C.

commercial sellers spread across different platforms (Chapter 7). Notably, these findings also offered insight into how participants structured their engagement with their local drug market context through their use of certain social media and messaging apps, in some instances using specific, 'low security' platforms to avoid more commercial social media drug market spaces. These findings are significant in relation to the importance of established patterns of social media engagement to studying social media drug markets (Section 10.3). However, they also provide an indication of the potential impacts these spaces may have on drug market harm in New Zealand, in particular, the continued potential for social supply to function as a form of harm reduction in relation to young people's social media drug trading behaviours.

10.2.3 The potential for increased and decreased drug market harms in social media drug trading

In this research, convenient access to drugs and sellers (either commercial or social supply) was associated with the potential for young people to be placed at greater risk of drug market harms such as buying adulterated drugs or victimisation as part of engaging with physical drug markets. NZDTS survey modelling associations between social media drug purchasing and the use of commercial seller types, in particular "gang sellers" (Cannabis OR=2.35; Methamphetamine OR=2.48; Ecstasy/MDMA OR=2.32; LSD OR=2.24) provided an indication that younger age groups could be more likely to engage in higher risk drug market transactions using social media and messaging apps (Chapter 5). This was illustrated by using interview and observational data on "lower tier" Discord drug servers (Chapter 6). Conversely, interview data also indicated that social media and messaging apps could facilitate harm reduction impacts by expanding people's abilities to source from social connections in lower risk local drug market contexts (Chapters 6 – "higher tier" Discord drug servers, and Chapter 9). These findings mirror established distinctions between open and closed physical drug markets (May & Hough, 2004), whereby participation in drug markets that are higher in 'openness' (e.g., transactions between strangers, more visible geographic location) is likely to engender greater potential for drug market harms in comparison to closed drug markets. This contrast between open and closed drug market dynamics is evidenced most clearly by the findings reported in Chapter 6, where the "quality" of a drug server (e.g., "lower tier" or "higher tier") was closely linked to how server administrators managed market entry and the degree to which the server was effectively closed.

As discussed in Section 10.1.2, "lower tier" Discord drug servers proved difficult to reconcile with the diversity of local drug market contexts in New Zealand. Hence, Chapter 6

illustrates how engagement with this type of drug server often placed younger, novice server participants at greater risk of drug market harms resulting from what could be high levels of opportunistic behaviour among server members. Notably, for several participants, “lower tier” drug servers represented their initiation into buying drugs from commercial sellers. As previously stated, these findings provide support for the potential of social media drug markets to push younger age groups into more commercial drug markets at an earlier stage in their buying careers, perhaps impacting on their experiences of drug market harms (Demant et al., 2019; McCulloch & Furlong, 2019). However, interview findings also illustrated how Discord could facilitate broader drug access within a lower-risk local drug market, provided drug server entry was more tightly controlled and members thoroughly vetted based on established connections to known sellers or other trusted server members. These “higher tier” drug servers were effectively closed to people lacking the correct local drug market connections. But for members, “higher tier” drug servers streamlined the combining of different trusted networks to facilitate access to a wider range of substances, buyers, and sellers within a local market setting.

Equally, Chapter 9 illustrates how the expanded social networking effect enabled on and across many social media platforms and messaging apps can also be used to expand social supply networks, creating “social supply supernets”. Interview data showed that this drug market dynamic enabled young people to access a broader range of drug connections within a drug market context characterised by many of the harm reduction norms associated with social supply. In this vein, social media drug markets may increase young people’s ability to *control* how they engage with their local drug market. Notably, Chapter 7 reports on interview participants using their ‘choice’ of drug trading platform or app to exercise a similar element of control over their engagement with their local drug market. The integration of ‘darknet social dealers’ (Chapter 9; and Section 10.1.3) into local “social supply supernets” could further isolate these networks from the local commercial drug market. In turn, this may decrease the need to interact with higher-risk, commercial seller types among network members, facilitating increasing diversification of local drug markets.

Finally, the NZDTS questionnaire design incorporated options relating to the potential for social media and messaging apps to facilitate feelings of personal safety as possible advantages of engaging with social media drug markets. For example, 28% of survey respondents who had purchased drugs from social media (n=2,707) indicated that social media purchasing allowed them to “avoid travelling to bad neighbourhoods”, while 23% cited an ability to “avoid drug dealer violence”. Additionally, as mentioned in Section 10.2.2 (see previous footnote), respondent entries in the open text field relating to this survey question frequently indicated perceptions of

increased 'safety' in social media drug trading resulting from a sense of community, or greater ability to build trust with others (n=38). These results provide an indication that some of the harm reduction benefits associated with social media drug trading among interview participants may also form part of people's experiences of social media drug markets in New Zealand more generally (See Section 10.5 for study limitations).

The study findings discussed in this section indicate the potential for social media drug markets to have a multifaceted impact on drug trading behaviours generally, and therefore perhaps also on young people's drug trading trajectories. Though findings provide support for existing research suggesting social media drug markets may increase young people's risk of exposure to diverse drug market harms, they also indicate the potential for the opposite dynamic to occur, particularly in more closed drug market settings. Study findings around social supply are a particularly valuable addition to current understanding of social media drug trading, given the academic focus on exploring more commercial social media drug trading to date. The findings presented in this thesis helps contextualise how social media and messaging apps may impact on social supply practices among young people by facilitating broader harm reduction benefits, while also posing new challenges. The potential for social media and messaging apps to raise novel and sometimes unanticipated issues as part of drug trading behaviours leads into the following section, where I consider some of the hidden complexities of social media drug trading. In this section, I place emphasis on social media and communications theory to explore the importance of the broader social media landscape in relation to social media drug markets.

10.3 The hidden complexities of using social media for drug trading

An overarching argument in this thesis relates to the importance of considering the relationship between the broader social media landscape and social media drug markets to better understand how the two intersect. The rationale for this perspective reflects a core distinction between these spaces and other forms of digitally facilitated drug market (e.g., darknet markets, webshops, online pharmacies) in that social media drug markets appropriate a platform infrastructure that is ultimately not designed to facilitate drug trading. This is notable for several reasons. Firstly, this factor means that people come to social media with already-established perceptions and practices around the platforms they use, which in turn also inform their drug trading behaviours (Chapters 7, 8 and 9). Secondly, it raises questions around the relationship between platform features and design orientation and their *adaptation* to drug trading behaviours (Chapters 6 and 9). And thirdly, the embedding of drug trading into a broader, complex digital environment articulates the

importance of considering trends in the social media landscape in terms of their potential implications for people who buy and sell drugs on these platforms or apps (Chapter 8).

Section 10.3.1 begins by considering how project findings evidence the overlap between people's broader patterns of social media engagement and their navigation of social media drug markets. Here I emphasise the importance of understanding how these established perceptions and practices mediate and shape people's judgements and actions in a social media drug market context. In Section 10.3.2 I synthesise the different ways in which platform affordances have been reconciled with different drug market contexts. In doing so I ask whether the process of adapting social media platforms for drug trading can engender varying levels of 'fit' between platform affordances and different drug market contexts. Finally, in Section 10.3.3 I discuss the significance of user data collection as an undercurrent of the social media landscape that may be particularly important to consider in relation to the potential for harm as part of engagement with social media drug markets.

10.3.1 Day-to-day social media engagement as an important shaping factor in social media drug trading behaviours

A fundamental premise underpinning this study's interdisciplinary perspective on exploring social media drug markets in their New Zealand context rests on the fact that non-drug related practices of navigating, understanding, and engaging with social media are likely to influence how people engage with social media drug markets. This overlap is evidenced and explored in Chapters 7 and 8 using interview data. Chapter 7 used a polymedia theory lens (Madianou & Miller, 2012b) to explore how the act of 'choosing' a platform for drug trading reflected the drug market context, and the nature of the relationship between buyer and seller. Meanwhile, in Chapter 8, I used the concept of "imagined surveillance" (Duffy & Chan, 2019) to consider how self-expressed 'low concern' for law enforcement among many interview participants nevertheless translated into digital security management practices aimed at minimising the risk of eventual exposure to the police. Chapter 8 findings demonstrated the relevance of existing perceptions and understandings of the potential for online surveillance on social media generally as shaping factors in developing risk management practices as part of drug trading on these platforms.

Both Chapters 7 and 8, and the theoretical concepts of polymedia and "imagined surveillance" (Duffy & Chan, 2019) underscore the fact that buyers and sellers in social media drug markets come to these spaces with pre-conceived understandings and perceptions of social media

and messaging apps. In turn, these perceptions and understandings guide the development of related behavioural norms and practices. The importance of these pre-existing perceptions and practices as shaping factors in social media drug trading has gone largely unarticulated by researchers to date. This is notable because these factors can be viewed as adding a layer of complexity and nuance to what at first glance often appears to be the streamlined process of adapting social media platforms for drug trading. This hidden complexity stems from both the variability of people's understandings and therefore practices of using social media for day-to-day actions and in turn also for drug trading. But it also underscores the way that convergence and overarching similarities between platforms in terms of design serve to disguise small, but notable differences between them that can have ramifications for drug trading.

A notable example featured as part of both Chapters 7 and 8 is the issue of platform security. The interview data illustrated that participants often had similar understandings of some platforms or apps as 'low security' (e.g., Facebook/Messenger, Instagram), and others as 'high security' (e.g., Wickr, Telegram, Signal). They used the absence or presence of specific design features (i.e., message timers or self-deleting data, username-based sign up and end-to-end encryption) as proxies for platform security. Similar findings have been reported by Bakken and Demant (2019) and Moyle et al. (2019). However, participant perceptions of platform security were a) not always accurate; and b) did not always reflect their actions in navigating social media and messaging apps for drug trading. Moyle et al. (2019) similarly found that many of their interview participants misattributed security features like end-to-end encryption to the apps they used for drug trading. However, application of communications theory in Chapters 7 and 8 of this thesis helps to further contextualise how engagement with low and high security platforms may be guided by factors that influence people's engagement with social media more generally.

Chapter 7 findings illustrated the importance of drug market context in influencing participant engagement with different social media and messaging apps for drug trading. The use of polymedia theory (Madianou & Miller, 2012b) in this chapter helped to demonstrate how perceptions of platforms and apps as 'appropriate' for use in different drug market relationships played an important role in guiding how participants ultimately used low and high security or convenience platforms. Distinctions between drug market contexts also facilitated the use of multiple platforms or apps for drug trading, with interview participants often using encrypted apps to connect with commercial sellers, but subsequently also using Messenger and Snapchat for social supply purposes. In accordance with polymedia theory, participants navigated drug trading on social media in a *holistic* manner, where emphasis was placed on considerations of *whom* they were buying from or selling to as a deciding factor in selecting a platform (Madianou & Miller,

2012a). These patterns were further influenced by local trends in social media engagement, particularly “taken for granted” social default messaging apps (Ling, 2012, See Section 10.1.2), which could act as barriers to the use of more secure apps, particularly for drug trades among ‘friends’ (Ling & Lai, 2016). In this vein, though security features continued to be important, they were one of many factors influencing how different platforms and apps came to be used for drug trading.

Similarly, in Chapter 8 the concept of “imagined surveillance” (Duffy & Chan, 2019) helped to reconcile the apparent contradiction between low-risk perceptions around law enforcement among interview participants and their subsequent risk management behaviours. “Imagined surveillance” (Duffy & Chan, 2019) illustrated how ingrained and established practices of thinking about and responding to the continuous potential for digital surveillance as part of everyday social media engagement could also feed into contexts of social media drug trading. In this vein, interview participants perceived digital exposure risk in more general terms, conflating the potential for exposure to an employer or parent with increased risk of exposure to police. In response to this more general perception of risk, participants took diverse risk management measures that could similarly involve considerations beyond platform security features like end-to-end encryption. For example, some participants placed emphasis on platform or app ownership as a proxy for security, trumping a lack of security features in some cases. Notably, in their exploration of digital capital in social media drug trading, Bakken et al. (2022) similarly suggest that security perceptions in social media drug markets are subjective, and that digital risk management may extend beyond the use of platform security features. Findings presented in this thesis help to articulate how this variation in security practices may reflect skills and perceptions developed through engagement with social media and messaging apps in *non-drug related* settings.

A final discussion point in this section relates to the importance of affordance theory in underpinning both polymedia theory (Madianou & Miller, 2012b) and the concept of “imagined surveillance” (Duffy & Chan, 2019). Particularly important to understanding the variation in perceptions of and actions relating to both platform or app ‘choice’ and digital security is the perceptual basis on which researchers suggest people navigate and use different affordances (e.g., Davis & Chouinard, 2017; Parchoma, 2014). The potential for there to exist considerable differences in people’s perceptions and engagement with affordances was originally proposed by Norman (2013) who suggested affordances can be conceptualised in two forms: ‘real’ and ‘perceived’. While real affordances reflect the inherent attributes or qualities of an object, perceived affordances refer specifically to those attributes visible to and made use of by an

onlooker (Norman, 2013). Duffy and Chan (2019) use a similar concept of “imagined” affordances (Nagy & Neff, 2015) to underpin “imagined surveillance”, with a focus on the importance of people’s perceptions, expectations, and attitudes in guiding how they make use of affordances.

The degree to which affordances reflect inherent structure or perception has been much debated in academic circles (e.g., Parchoma, 2014). But in the context of this research the role of perception in engaging with platform affordances may be particularly useful in understanding the hidden complexities of navigating social media and messaging apps for drug trading. The potential for partial or inaccurate perceptions of platform affordances in the social media landscape is high. This risk reflects the ongoing nature of platform changes and the implementation of new features or changes to platform capabilities, making it difficult to keep up with the ‘reality’ of platform features and structure. In turn, people’s established understandings and social media practices may act as *barriers* to shifting their perceptions of affordances to reflect changes to platform features. These dynamics can be compounded by intentional decisions on the part of platform and app designers whether and how to announce, or signpost new features or design changes on platform interfaces (e.g. Santos & Faure, 2018). This factor can mean that platform capabilities remain hidden to users unless explicitly sought out or engaged with. An example of this dynamic drawn from interview data is the use of Messenger secret chats, which offered participants an easy way of leveraging end-to-end encryption without shifting away from the Messenger app. However, it appeared that many interview participants were either not aware of the secret chats function, or alternatively continued using regular chats despite awareness of this feature. This pattern may in part be explained by the participants’ perceptions of Messenger persistence affordances as permanent-by-default and people’s ingrained day-to-day engagement with Messenger in this capacity (See Chapter 3, Table 4, pp. 47-48 for description of persistence affordances). But Santos and Faure (2018) have also highlighted a marked lack of marketing or in-app communication from Meta around the launch of Messenger secret chats in 2016. This factor is important because it ties into the second aspect of affordance theory’s relevance to this research: the relationship between a platform or app design that reflects specific corporate interests, and drug trading behaviours.

10.3.2 Platform affordances and their adaptation to drug trading

As part of Chapter 3 presenting the theoretical framework for this project, I discussed the importance of acknowledging that technology – in this case social media – is both shaped by and shaping of user behaviours (Sections 3.2.1 and 3.3.1). As has been demonstrated in the previous

section, affordance theory feeds into the analysis presented in Chapters 7 and 8, both of which emphasise the perceptual basis through which people engage with platform features and functions. However, Chapter 9 demonstrated how specific platform affordances of visibility, association, and communication (Chapter 3, Table 4, pp. 47-48) could be used to expand social supply networks beyond what would be feasible in non-digitally mediated settings. Additionally, though affordance theory does not feature in Chapter 6, it provides a way of thinking about the process of adapting Discord servers to function as drug markets, which will be considered below.

As highlighted by this thesis, and demonstrated in the existing literature (e.g., Bakken et al., 2022), social media and messaging apps are well suited to facilitating drug trading behaviours. This suitability reflects the ways in which platform affordances streamline social connection, communication, and organisation, whilst also lowering the amount of effort involved in maintaining transaction security by virtue of inbuilt platform features (See Section 10.2.1). By extension, the development of different social media drug market dynamics such as Discord drug servers highlights the ways in which differences in the arrangement of affordances across platforms result in varying drug trading practices (See also, Bakken & Demant, 2019). Yet the fact that social media platforms may be designed to facilitate certain types of social interaction means that questions emerge around whether the obvious suitability of social media infrastructure for drug trading can mask deeper tensions between platform affordances and this context of user action.

The qualitative data presented in Chapters 6 and 9 provide some indication of how the relationships between platform design, affordances and the demands of a particular drug market context may be more complex than they initially appear. The rise of Discord drug servers as they existed during the period in which data was collected for this research provided a case study of the process of *learning* to adapt a given platform infrastructure to facilitate drug trading (Chapter 6). In this context, though drug servers were easily created, and in the case of “lower tier” servers, easily joined, learning to manage them effectively, or buy and sell on them safely could prove more complex than anticipated. This was evidenced by both interview and observational data in relation to the difficulties of curbing opportunistic behaviours on “lower tier” Discord drug servers, and the resulting strategies “lower tier” server members developed to assess the trustworthiness of both drug servers and other members (e.g., checking mutual servers, keeping abreast of scam allegations, etcetera). Here, the benefits of pseudonymity affordances (Chapter 3, Table 4, pp. 47-48) in facilitating the creation of large, easily accessed drug servers proved problematic to reconcile with a diversity of overlapping local drug markets (See Section 10.1.2) and the continued need for physical transactions. These challenges were reflected in observation of server scam

channels, where posts from members often struggled to identify scam accounts owing to the ease with which usernames could be changed on Discord. From this perspective, “lower tier” Discord drug servers illustrated the potential for complexities to emerge as part of the process of adapting a new social media environment to facilitate drug market dynamics. In this context, these tensions contributed to the increased risk of harm faced by server members as part of their interactions with “lower tier” servers. Conversely, it could be suggested that “higher tier” Discord drug servers (Chapter 6) provided an example of more successful reconciliation of pseudonymity affordances with local drug market dynamics. The strict control of server entry and vetting of members via links to existing members meant that the benefits of pseudonymity affordances could be leveraged more successfully without the drawbacks of increased opportunism (See Section 10.2.3).

Chapter 9 evidenced how the appropriation of visibility, communication, and association affordances in the service of social supply-type dynamics could expand this drug market context and its affiliated harm reduction benefits while streamlining drug access. As part of the chapter’s discussion, I suggested that the expanded, lower risk drug market access resulting from an ability to form “social supply supernets” might reflect an element of “*complementarity*” (Gibson, 1979) between platform design and user action in this context. For example, in Chapter 2, Sections 2.3 and 2.2 I discussed the importance of social media and messaging apps in facilitating, creating, and maintaining pre-existing or non-digital relationships (We Are Social & Hootsuite, 2022). Additionally, I noted the design of platforms and apps to incentivise or promote certain forms of social connection or user engagement (e.g., Ellison & Vitak, 2015; Piwek & Joinson, 2016). On social media, “social supply supernets” were facilitated by virtue of an increased ability to “anchor” people in their physical social contexts and networks (Zhao et al., 2008) across different platforms. In turn, this dynamic reflected a particular method of engaging with social media features like profiles (visibility affordances), visible social networks or follower lists (association), tagged photos (association) and group chat functions (communication). I suggest that “social supply supernets” may be appropriating these affordances in the service of a drug trading action that closely resembles, or in effect, mirrors, how many popular social media platforms (specifically in this study: Facebook, Instagram and Snapchat) *encourage* or even *demand* (Davis, 2020) that people to engage with them. This more explicit alignment between platform design and user behaviour may mean people involved in this type of social media drug trading context can more effectively leverage the same benefits of platform features that enable streamlined social networking as part of their day-to-day lives.

The findings discussed in this section provide some indications that perceptions of social media as inherently well-suited to drug trading behaviours may oversimplify the complexity and multi-faceted nature of the relationship between platform affordances and their adaptation to drug trading. In this study, these different affordance-user relationships have impacted on the levels of drug market harm participants have experienced as part of social media drug trading (Section 10.2.3). These findings signal the importance of considering that social media platforms hold “positions” (Lawson, 2008; Chapter 3, Section 3.3.1) that have very little to do with drug trading. As such, they are likely to “*push and pull*” (Davis, 2020, p. 18) their users toward particular actions and away from others. While users can navigate, interpret, and adapt these platform “positions” (as discussed in Section 10.3.1), designers’ intentional arrangement of affordances on social media platforms likely have notable implications for drug trading dynamics and buyer and seller experiences.

An important factor underpinning the importance of social media and app design to the study of social media drug markets rests on their ownership by private companies. As such, platform design decisions are likely to reflect explicit corporate interests and agendas (e.g., Van Dijck, 2013; Zuboff, 2019). The collection of user digital trace data provides an example of one such factor guiding platform design and functionality. The following section considers the implications this global trend may have for people who buy and sell drugs via social media and messaging apps.

10.3.3 The future consequences of digital trace data

The collection of user data is a notable undercurrent to the broader social media landscape and forms part of a larger, global data trade (See Chapter 2, Section 2.4.2). The emergence of social media drug markets therefore raises important questions around how digital trace data generated as part of these transactions, or as part of engagement with drug-related content more generally, will be used, by whom, when and for what purposes. I suggest this undercurrent to the social media landscape at large constitutes another complexity of social media drug trading. This categorisation reflects what researchers argue is the “black boxed” nature of big data as a whole (the collection, aggregation and analysis of large data sets) and its inaccessibility to the broader public, who lack insight into how their digital trace data is used to generate ‘real world’ outcomes (e.g., Brevini & Pasquale, 2020; O’Neill, 2016; Pasquale, 2015). Additionally, the growth of dynamics like platformisation (Helmond, 2015; See also Section 2.1), evidences the intricacy and breadth of contemporary social media data collection practices and the difficulty of escaping this

data collection net without opting out of digital participation entirely (e.g., Acquisti et al., 2015; Koops, 2011; Lyon, 2018).

In line with growing awareness of digital surveillance generally (See discussion of “imagined surveillance” in Section 10.3.1), researchers have argued that public awareness of digital trace data collection by social media companies, as well as private and public entities more broadly, is increasing (Lyon, 2018). Interview participants expressed an awareness of, but also a sense of resignation and uncertainty toward the collection of their digital trace data by social media companies (Chapter 8). Though some articulated concern that their digital trace data could be used to incriminate them and lead to their arrest by police, many others felt this was unlikely to eventuate. They reasoned their data was not easy for law enforcement to get hold of, or alternatively, that they were not high priority enough for law enforcement to put effort into gathering their data (Chapter 8). Similar sentiments have been expressed by participants in social media and digital drug markets research generally (Aldridge & Askew, 2017; Childs et al., 2022; Moyle et al., 2019). Resignation, or a sense of helplessness in relation to maintaining digital privacy has been described as “privacy cynicism” (Hargittai & Marwick, 2016), which reflects in part the extent to which the contemporary collection, spread and use of digital trace data is ultimately beyond individual control.

As part of Chapter 8 I suggested that collection of digital trace data, and its use across different sectors could alter associations between legal penalties or criminal records and the perpetuation of social and economic harms and stigmas against people who use drugs. For example, drug related criminal records have been linked to difficulties finding employment (Uggen et al., 2014; van't Zand-Kurtovic, 2017), particularly given the growth of criminal background checks as part of job applications (Heydon & Naylor, 2018; Rovira, 2022; van't Zand-Kurtovic, 2017). These records also impact on educational opportunities (Stewart & Uggen, 2020). However, as digital trace data sets are integrated into different public and private sectors, formal judicial sanctions may become more incidental in perpetuating and crystalising this type of negative outcome. Instead, associations between an individual and drug use or supply may be drawn from the combination and analysis of digital trace data sources. Moreover, the continued opacity of the data sets and the algorithms used to analyse them raises questions around whether the public and private entities drawing on big data analytics will have insight into precisely how and on what basis big data algorithms generate the results they may use (O'Neill, 2016).

As I discussed in Section 10.1.1.1, social media drug trading is likely to be closely linked to normalisation and low risk perceptions around law enforcement (Chapter 8). Though attitudes

towards drugs and their use are highly variable across cultural and social contexts, at the time of writing it seems plausible that normalisation of drug types such as cannabis may increase in the coming decades as more countries adopt policies of decriminalisation or legalisation. In turn this may lead to a softening of social perceptions around some drug types and forms of drug use within broader society, and within the justice system. However, the question of whether a person's "digital footprint" (Koops, 2011) will be as forgetful and forgiving is likely to be a complex and important one. O'Neill (2016) argues that while social perceptions and biases continually evolve, *"automated systems are stuck in time until [IT] engineers dive into change them"* (p. 204). This statement highlights the potential for digital trace data and its subsequent analysis to perpetuate stigmas and assumptions even if social attitudes and practices may change over time.

In the future, there may be considerable uncertainty about the relationship between a person's involvement with social media drug markets or drug use, their broader digital trail, and negative economic and social outcomes. In turn, these ambiguities may be coupled with the potential for systemic entrenchment of outdated stigmas and discriminatory practices. This points to the potential for a rearranging of what constitutes drug market risk in a digital world, which is likely to be consequential for people involved in criminal activities on social media beyond drug trading.

10.4 Practice and policy implications

This study has a range of implications for the development of drug policy, and prevention and harm reduction initiatives. Firstly, the rapidly evolving nature of social media drug trading underscores the need for ongoing monitoring of this trend in New Zealand. Practices involving existing platforms and apps may change over time in response to shifting platform features or policing strategies, and new platforms may emerge as drug markets while others disappear. These factors mean that researchers, policy makers and harm reduction practitioners need to keep abreast of developing trends. There may be value in releasing some, less sensitive forms of police social media drug market monitoring data publicly, or to select organisations and practitioners, on a regular basis in a manner resembling the police press releases on waste water testing results (See Section 1.2). This could serve as a source of up-to-date information on social media drug trading trends, allowing harm reduction services to respond more effectively. Future iterations of the NZDTS should continue to incorporate survey questions on engagement with social media drug markets to provide annual or bi-annual indications of changing trends in social media purchasing.

Harm reduction and prevention strategies tailored towards young people and their use of social media drug markets are needed. In Chapter 5, I highlighted the importance of ensuring that harm reduction and prevention messaging is shared through a range of social media channels, which evolve alongside changing patterns of social media engagement among younger age groups. For example, the *New Zealand Drug Foundation* has recently launched a platform “The Level” (<https://thelevel.org.nz/>), providing practical harm reduction information for people who use drugs. “The Level” has accounts on Instagram, TikTok, and Facebook. Instagram and TikTok are likely to provide particularly useful channels for sharing harm reduction information with a younger user base.

More recently, research has emerged evaluating the use of the messaging apps WhatsApp (Calvo et al., 2021) and Telegram (Davitadze et al., 2020; Rolando et al., 2023) to connect harm reduction outreach workers and people who use drugs. These studies provide evidence of the value of instant messaging as an accessible, flexible and anonymous medium that can facilitate contact across different groups of people who use drugs, including hard-to-reach groups who are less likely to visit in-person harm reduction clinics (Calvo et al., 2021; Davitadze et al., 2020; Rolando et al., 2023). In New Zealand the Alcohol and Drug Helpline, including the linked Youth Helpline service (<https://alcoholdrughelp.org.nz/>), can be accessed via texting and voice calls. In relation to Youth Helpline, the omission of an instant messaging option is notable. Though similar to texting, being able to engage with alcohol and other drug councillors via a familiar messaging app like WhatsApp may feel more comfortable for young people (e.g., Mason & Ide, 2014). However, practitioners would need to be mindful of data security when selecting a messaging tool.

Notably, two of the aforementioned studies indicate the potential for harm reduction practitioners to administer or participate in messaging app-based drug discussion groups, with outreach workers providing an ‘in-house’ source of harm reduction information to group members (Calvo et al., 2021; Rolando et al., 2023). This type of messaging app-based collaboration with communities of people who use drugs may indicate the potential to consider similar interactions between outreach workers and group-based social media drug markets like Discord servers. However, research findings drawn from exploration of harm reduction discussions on darknet market forums highlight this type of participation can be more complex in settings linked to digital drug marketplaces (Rolando et al., 2023; Rolando & Beccaria, 2018). In these instances, forum proximity to the darknet marketplace influences the nature of discussion threads, reducing focus on harm reduction specifically (Rolando & Beccaria, 2018; Van Hout & Hearne, 2017). For example, in their exploration of darknet market forum NPS discussions, Van Hout and Hearne

(2017) found that although harm reduction around NPS use was discussed, the majority of discussion focused on darknet transactional issues, such as selecting vendors and products, or assessing product quality and vendor reputation. Similarly, Rolando and Beccaria (2018) suggest that darknet market forums can be more challenging spaces in which to facilitate peer-led harm reduction communities owing to the presence of sellers on the forums, low trust and solidarity between members, and the wider variety in drug use habits and lifestyles. Social media drug selling groups are likely to present similarly challenging environments in which to facilitate connections between outreach workers and people who use drugs owing to what can be high levels of volatility among members and a mixing of different drug market groups (Chapter 6; Sections 10.1.2 and 10.2.3). However, their localised nature may present viable and valuable avenues through which to connect group members with in-person harm reduction services in their region or city in a manner that is more difficult to replicate on darknet markets due to their geographically mixed membership bases.

The flexibility and adaptability of social media drug markets is also likely to have ramifications for how effectively law enforcement can police this trend. The evolving nature of social media drug markets engenders a similar game of cat-and-mouse to that researchers have noted in relation to the continued adaptation of darknet markets in response to law enforcement operations (Décary-Héту & Giommoni, 2017; Ladegaard, 2020). Effectively policing social media drug markets at a *national* level is likely to be difficult and resource intensive given the global scale of these platforms, the power of corporate interests invested in maintaining user engagement, and the complex bureaucracy of filing data requests through international courts (Chapter 8). These complexities mean that police action against social media drug markets is unlikely to compete with the power of the social media companies themselves in determining the viability of social media drug markets.

The potential for social media company actions to have a substantial impact on the viability of drug trading behaviours on their platforms is illustrated by Discord's implementation of anti-harassment algorithm Sentropy in 2021 (Kastrenakes, 2021; See Chapter 6). The tool combed through Discord servers identifying those in breach of platform Terms of Service (ToS), automatically deleting them, and banning or warning their members. Though better managed servers were quick to adapt²¹, it is likely that the launch of this tool played an important role in

²¹ After the data collection period elapsed, I was able to join several, more tightly managed drug servers, which were monitored for several months alongside the original servers (Appendix I). Newly joined servers were quick to adapt to Sentropy's launch. Several established replacement groups on encrypted messaging apps in case of server closure, and 'cleaned up' the server itself by renaming selling channels

decreasing the size of New Zealand's Discord drug server scene. Alternatively, it may also have forced the rapid transformation of drug servers towards smaller, more discreet, closed structures (Chapter 6). This example highlights the power social media companies wield in dictating what behaviours are viable on their platforms. Broadly, social media companies have increased their use of proactive, machine learning approaches to identifying drug trading content (e.g., Li et al., 2019; Zhao et al., 2020), and filtering or blocking the use of a range of evolving drug-related terms (Bickert, 2018; "Continuing our efforts to combat the US fentanyl crisis," 2022).

Snapchat has also responded to calls for greater platform accountability in actively reducing drug sales on the platform. The sale of counterfeit pharmaceuticals by anonymous dealers on Snapchat has resulted in a sizeable number of teen overdose deaths in the US (e.g., Lerman & De Vynck, 2021; McCormick, 2021). In response, Snapchat has rolled out a range of tools and resources aimed at preventing younger US-based platform users from buying counterfeit pharmaceuticals via the platform. Notably, these measures include the launch of an in-app drug education portal called "Heads Up" ("Continuing our efforts to combat the US fentanyl crisis," 2022; "How Snap is responding to the fentanyl crisis," 2021; Malik, 2021). "Heads Up" distributes content from verified US harm reduction organisations working specifically in relation to the US opioid crisis and the growing issue of fentanyl-contamination in US overdose deaths (Malik, 2021). As part of the portal launch, Snapchat collaborated with the non-profit organisation *Song For Charlie* (<https://www.songforcharlie.org/>) to create a national US public awareness campaign on the dangers of "fenta-pills" (pressed pills containing fentanyl) ("Educating Snapchatters on the dangers of fentanyl," 2021). "Heads up" is automatically activated if a Snapchat user searches for drug-related keywords in the app (Malik, 2021).

Though specific to the US Fentanyl crisis, Snapchat's response illustrates how social media companies can be more actively engaged in the promotion and hosting of harm reduction content beyond simply allowing practitioners and organisations to use their platforms. However, whether this strategy can be more broadly implemented could be complex given what is likely a reluctance on the part of social media companies to be viewed as 'condoning' drug use. For example, Snapchat's actions around the opioid crisis may have in large part been necessitated by the public outcry and controversy surrounding the availability of "fenta-pills" on the app, as well as the considerable harm caused by Fentanyl in the US (e.g., Hoffman, 2022). Whether public pressure and media coverage of the harms caused by social media drug markets on a broader scale will

using coded language and requiring sellers to post adverts where text was layered over a photograph (Appendix J). This latter action was alleged to help prevent the identification of drug adverts through the scanning of text-based messages on the server.

prompt the same types of action from social media companies is questionable. These potential difficulties point to the importance of governmental and international regulation of the social media sector. Government regulation of social media is a broad and complex landscape, and largely beyond the scope of this research. However, in the sections below I discuss locally emerging regulation in terms of its implications for social media drug trading and related harm reduction strategies in New Zealand.

In 2022, online safety organisation *Netsafe* (<https://netsafe.org.nz/>) and technology lobby group *NZTech* (<https://nztech.org.nz/>) launched the Aotearoa New Zealand Code of Practice for Online Safety and Harms, which commits signing technology companies to reducing harmful online content exposure in New Zealand (Netsafe & NZTech, 2022). At present, the Code is principally concerned with reducing digital harms in seven areas ranging from child sexual exploitation and abuse to disinformation and violent or graphic content. Digital drug trading is currently not included. Major social media companies such as Meta, ByteDance (TikTok), and Twitter, among others, are signatories of the Code. However, signing is voluntary, and the Code seeks to establish best practices across different digital products and services in collaboration with signatories who take a self-regulatory approach to enacting the code's regulations (Netsafe & NZTech, 2022).

The Code's non-binding self-regulatory approach, and the heavy involvement of the *NZTech* lobby group have prompted many advocacy groups to argue it is unlikely to result in real change. They argue the Code is likely to be used by its signatories to avoid further, more legally consequential regulation while making only superficial changes to their business practices (Corlett, 2022; Kilpatrick, 2022; Sawers, 2022). However, others argue the Code may provide a starting point for social media companies being held more accountable by the NZ government, helping to establish the groundwork for further regulatory responses (Ennor, 2022; Scott, 2022).

Despite the Code's newness, and the issues it may present, it could be valuable to add a digital drug trading category during these early stages in its implementation. This addition may help to foster more transparent social media reporting of drug trading content in New Zealand. Increased company-led transparency of reporting may also help develop stronger, targeted regulatory policies aimed at reducing social media drug trading in the future²². Additionally,

²² Note that in June 2023 after this thesis was submitted for examination, the Department of Internal Affairs announced an overhaul of media and content regulation in New Zealand with changes principally aimed at regulating social media content and platforms (Mathias, 2023; Pullar-Strecker, 2023). Proposed changes would bring New Zealand digital content regulations in line with similar international frameworks such as the UK's Online Safety Bill (Lomas, 2023), and the EU's Digital Services Act (O'Carroll, 2023). The

reports could represent a valuable source of information on the development of local social media drug markets, complementing the need for ongoing monitoring previously discussed. These additional information sources could be similarly valuable in helping harm reduction organisations and practitioners target and inform their services and strategies.

New Zealand privacy laws have been updated recently with the passage of the new Privacy Act 2020 (Privacy Act 2020). The revised Act takes important steps towards regulating the collection, use and storage of personal data in New Zealand, including proposed legislation to require companies and government agencies to notify users if they buy, sell, or share a person's digital trace data (Daalder, 2022). But legal researchers suggest additional principles could have been implemented as part of the revisions, bringing the Act in line with the European General Data Protection Regulation (GDPR) (Chamberlain, 2022; Gunasekara, 2020). They draw particular attention to the absence of a "right to be forgotten", which enables individuals to request that digital trace data be removed from internet searches and databases in specific situations (Chamberlain, 2022; Gunasekara, 2020). Discussion presented as part of this thesis underscores the need to consider how drug-related digital trace data may have a continued and diverse impact on people's lives as they age. Importantly, in 2004 New Zealand implemented the Criminal Record (Clean Slate) Act, otherwise known as the Clean Slate scheme (Criminal Records (Clean Slate) Act 2004). The scheme allows for some types of criminal record to be concealed from prospective employers once seven years have elapsed without further conviction. Minor drug charges such as drug possession may be more likely to meet the requirements for concealment (e.g., the criminal charge involved no custodial sentence) given they probably involve fines rather than imprisonment (Misuse of Drugs Act 1975). While the Clean Slate scheme (Criminal Records (Clean Slate) Act 2004) offers people a chance to move forward unhindered by certain criminal convictions, in a digital world, legislating a "right to be forgotten" similarly ensures that people are not subsequently disadvantaged by their "digital footprints" (Koops, 2011).

I also briefly note the potential for changes to US legislation to impact on the viability and efficacy of local responses to social media drug trading among NZ law enforcement. Many social media companies (excluding ByteDance, the Chinese company that owns TikTok) are US-based, meaning that international law enforcement agencies must file preservation or data retrieval requests using the appropriate US legal channels (See Chapter 8). A recent report commissioned

changes would see social media companies operating in New Zealand legally required to comply with established codes of practice to manage harmful content across their platforms. This development may signal significant changes to social media drug trading and the spread of drug-related content on social media in New Zealand in the near future.

by *Stop the Void* (<https://stopthevoid.org/>)—an organisation comprised of US parents who have lost children to the sale of “fenta-pills” on social media—highlights the feasibility of incentivising social media companies to treat drug trading content the same way they treat terrorism and child pornography. The report identifies several different areas in which social media responses to drug trading can be improved. For example, it highlights the need for independent, third-party auditing of social media content flagged as containing drug trading material. Other recommendations made include the mandatory archiving of all identified drug trading content to ensure it is available for use in relevant police investigations, alongside a more structured and streamlined process of company engagement with police data requests and court orders (Stop the Void, 2022). It may be that the implementation of changes such as these in the US increases the efficacy of law enforcement responses to social media drug trading in New Zealand. This impact reflects the potential for a more streamlined process of filing legal requests, shorter response times, and changes to social media platform data retention policies to benefit international agencies who file requests through the US legal system. However, from a New Zealand standpoint, a more feasible and impactful means of reducing the harms associated with local social media drug markets may be through changes to domestic drug policy.

In this vein, this thesis supports the growing calls from drug policy advocates and harm reduction organisations for significant policy change to how drug use and low-level drug offenses are treated within New Zealand’s criminal justice system. From a pragmatic perspective, the sheer accessibility of drugs via social media drug markets, and the adaptability of this technology indicate that a punitive approach to drug use and low-level drug offenses may be resource intensive and ineffective in curbing this trend. Social media drug market trends such as “lower tier” Discord drug servers and young people’s engagement with these spaces illustrates how a broader context of drug prohibition in New Zealand continues to place young people who use drugs at risk of harm (See Chapter 6). This thesis therefore suggests that policy makers seriously consider alternative drug policy avenues around decriminalisation, legalisation, and regulated sale of widely used recreational drug types such as cannabis, MDMA and psychedelics, and low-level social supply behaviours in New Zealand.

10.5 Research limitations

This research has a number of limitations that should be taken into account when interpreting the findings. The research utilises a mixed methods approach to exploring social media drug markets in New Zealand. A combination of quantitative and qualitative methodology components was

used to facilitate in-depth contextualisation and understanding of this topic. Additionally, the multidisciplinary theoretical framework drawn on helps to bring a new perspective to the framing of study findings compared to the largely criminological framing of social media drug markets research to date. The NZDTS survey findings (Chapter 5) are drawn from a very large sample (N=23,500) enhancing the reliability of findings. The NZDTS survey involved participants located across New Zealand, facilitating engagement with a diverse range of experiences with social media drug markets. The inclusion of observational data on Discord drug servers provided a means of contextualising interpretations of interview results and deepening the analysis. Methodological triangulation of these different data collection methods and their relationship to one another as part of an overall sequential mixed methods design increased the internal validity of this research.

The NZDTS is a convenience survey designed to provide a “snapshot” of current trends in drug use and purchasing in New Zealand. As such, the NZDTS is not designed to be representative of people who use drugs in New Zealand. The NZDTS sample is likely to report much higher levels of drug use in the previous six months in comparison to the general population (see Chapter 5 limitations for a comparison between the survey sample demographics and NZ census and NZHS data, pp. 103-104). Additionally, the validity of the findings concerning methamphetamine were affected by the relatively small sample size (n=79). Moreover, the NZDTS was promoted on Facebook, where targeting was used to direct survey promotion towards certain groups based on an indicated interest in certain music genres, alcoholic beverages or the night-time economy. These factors are likely to further influence the demographics, drug use and purchasing patterns of the groups most likely to complete the survey. This approach is also likely to have impacted on survey findings vis à vis social media drug markets, in particular the dominance of Facebook as the platform most often used for drug purchasing among the survey sample. However, as has been stated at several points in this thesis, rates of engagement with Facebook in New Zealand are high, with over 80% of the population aged between 18-64 making use of the platform monthly in 2022 (We Are Social & Kepios, 2022). As such, it is reasonable to conclude that the high levels of Facebook use for drug trading indicated in the NZDTS survey is representative of social media engagement within New Zealand’s broader population.

Lastly, it is important to note that the design of the 2020 survey questions relating to purchase “location” and seller types meant respondents could indicate multiple options simultaneously. This was done to reduce the repetitiveness of the survey questionnaire, particularly if participants indicated having used multiple seller types or purchase “locations” in the previous six months. However, this reduces the precision of associations between social media drug purchasing and demographic and drug market variables presented in Chapter 5.

Regarding the online interview component of this study, the findings are based on the experiences of 33 interview participants, 11 of whom completed follow-ups. This sample is sizeable by qualitative interview research standards (e.g., Guest et al., 2006; Hennink et al., 2017). Data saturation was judged based on a) the frequency with which new findings emerged as data collection progressed; b) overlap between new interview data and existing thematic codes; and c) the 'richness' of data and emerging analysis (Fusch & Ness, 2015; Guest et al., 2006; Hennink et al., 2017). Internal validity of interview findings was established using a robust and reflexive process of data collection procedures (See Appendices E, F, G, and H) and thematic analysis (See Chapter 4, Section 4.5.2; and Appendix K). At varying points during the collection of interview data I used additional methods to increase the dependability (Lincoln & Guba, 1985) of my qualitative analysis (e.g., Creswell & Miller, 2000; Long & Johnson, 2000). The use of follow-up interviews facilitated a degree of member checking (e.g., Creswell & Miller, 2000; Motulsky, 2021), as I was able to 'test' emerging findings with study participants (Motulsky, 2021). Interview findings on Discord, drawn from a smaller subgroup of interview participants (n=12), were both confirmed and contrasted via methodological triangulation (e.g., Fusch et al., 2018) with observations of Discord drug servers, helping to increase the construct validity of findings presented as part of Chapter 6.

The interview sample was generated using a purposive recruitment strategy whereby participants volunteered to take part in an interview. Though this approach reduces the generalisability of study findings, purposive sampling has established benefits in generating research participants from otherwise hard-to-reach or hidden populations, such as people who use drugs (Barratt, Ferris, et al., 2015; Sifaneck & Neaigus, 2001; Watters & Biernacki, 1989). The structure of the interview recruitment approach (See Section 4.3.1) is likely to have influenced the high number of participants in the interview sample involved in social supply given they are more likely to view participation as low risk, while disincentivising participation among more commercial seller types. Despite these factors, the interview data was invaluable in facilitating a deeper understanding of social media drug markets in New Zealand. The findings chapters (6-9) illustrate that the interview data generated a nuanced understanding of people's perceptions and behaviours in using social media and messaging apps for drug trading.

The recruitment process may also have influenced the drug use characteristics of the participants. The interviews primarily captured the use of social media drug markets to access or sell more normalised drug types like cannabis, MDMA and LSD, rather than stigmatised drugs such as methamphetamine and opioids. How social media might be used to facilitate drug markets for these more stigmatised drug types, or used in contexts of substance misuse is not explored in this

thesis and could be the subject of future research. From a demographic standpoint, the interview sample was comprised largely of those aged between 18 and 25 (n=18) who identified as male (n=22), were NZ European/Pakeha (n=27, 3= Māori), and who resided in urban centres (e.g., 10=Auckland, 10=Wellington). The low number of Māori participants is notable given that findings in Chapter 5 indicated that Māori were more likely to purchase cannabis from social media (See Section 10.6). Together, these factors impact on the generalisability and external validity of research findings in relation to the wider context of engagement with social media drug markets in New Zealand.

The selection of Wickr as the interviewing tool is likely to have a) influenced the high number of interview participants already using Wickr to buy or sell drugs (n=17); and b) impacted study findings vis à vis the use of other social media platforms for drug trading. Wickr's place as a more niche security focused, messaging app may have disincentivised participation for some people. This may particularly have been the case among people who buy or sell drugs on more mainstream platforms such as Instagram or Facebook, and who may lack confidence and skill in navigating new social media and messaging app security features. Conversely, people with *greater* technical skill and understanding of online security may have preferred to use an alternative encrypted messaging app such as Telegram or Signal as opposed to Wickr. As a result, this may mean that the use of alternative social media and messaging platforms for drug trading in New Zealand is underrepresented and not fully contextualised in this thesis.

A final limitation of online interview findings relates to their basis on self-report data. This is a widespread limitation of both face-to-face and online interviews. The encrypted online interview format via Wickr used in this study may have encouraged more open conversation and self-disclosure on the part of interview participants (e.g. Gibson, 2022; Pearce et al., 2014).

Lastly, I address the limitations of observational data collection. Though the studied Discord drug servers were loosely monitored over a period of almost a year, intensive observation took place over a relatively short period of time (three months). The observations were also limited to "lower tier" drug servers (Chapter 6). As discussed in Chapter 6, based on the interview findings, there was considerable variation in Discord drug servers in terms of their size, management, and membership. However, the full range of drug server types was problematic to investigate using observation given many of these servers were closed, and vetting procedures, alongside strict controls on invite links prevented members from joining without thoroughly verifying their connections to others on the server. Additionally, the non-participant approach taken to this method meant that observational data was not complemented by active

participation in the communities on the drug servers that were studied. Active participation in the communities on these servers may have facilitated a more in-depth and nuanced understanding of the observed drug servers. However, this method has its own drawbacks, particularly concerning researcher safety in potentially hostile digital settings (e.g., Barratt & Maddox, 2016).

Finally, this thesis aimed to provide a “snapshot” of social media drug markets as they existed in New Zealand during the time frame in which data collection was conducted. This means that findings may be limited in the extent to which they reflect the rapidly evolving nature of social media drug markets in New Zealand. For example, Discord drug servers have featured heavily in this thesis, but may have been a largely temporary local trend, as illustrated by recent closures of Discord drug servers. Alternatively, contemporary drug server dynamics may bear considerable differences to those documented in Chapter 6 given changes to Discord’s approach to content regulation (See Section 10.4). Additionally, Amazon Web Services (AWS) have recently announced the pending shutdown of the Wickr messaging platform from late-2023 (Marcelline, 2022). Consequently, people using this platform to buy and sell drugs will need to move elsewhere, perhaps to established alternatives like Signal or Telegram, or new end-to-end encrypted messaging clients such as Keybase²³. Hence, this thesis documents the use of social media and messaging apps for drug trading during a bounded time-period: late 2019-late 2021, which may not capture some of the more recent changes or trends in the New Zealand context.

10.6 Future research directions

Research findings presented in this thesis indicate several potentially important avenues for future research on social media drug markets and their impact on drug use.

As discussed in Section 10.5 on research limitations, there are groups of people whose experiences using social media drug markets have not been contextualised in this research. Two such contexts may be particularly important avenues for future research on social media drug market engagement in New Zealand, specifically people who use methamphetamine and Māori. As outlined in Section 10.5, NZDTS sample sizes involving methamphetamine purchasing were small, and this group was not represented as part of interview findings. Methamphetamine’s association with gang sellers, and marginalised populations in New Zealand makes it important to understand from a harm reduction perspective how social media and messaging apps may be used

²³ Keybase (<https://keybase.io/>) is an end-to-end encrypted messaging and file sharing app that can also be mapped onto other social media identities to encrypt communications across platforms and apps. The app was acquired by Zoom in 2020.

in this drug market context. Additionally, Chapter 5 findings also indicated that Māori were more likely than non-Māori to purchase cannabis via social media. This points to the importance of considering how social media drug market engagement may differ across different cultural groups within the same population. Māori have historically high rates of cannabis consumption compared to other ethnicities in New Zealand (Ministry of Health, 2022) and are disproportionately arrested and convicted for cannabis offences, bearing significant lifetime negative consequences from criminal conviction on health, employment, housing and travel (Fergusson et al., 2003). Understanding how Māori engage with social media drug markets is therefore an important means of adapting responses to fit the needs of this discriminated group and empower Māori and Iwi-led harm reduction initiatives and practitioners. It will be important for this research to be guided by a Kaupapa Māori research paradigm (Cram, 2019; Pipi et al., 2004) incorporating Māori whakapapa (worldview) and led by Māori researchers. A qualitative component will be particularly important to ensure adequate contextualisation and understanding.

Additionally, Chapter 9 provided some contextualisation of the overlap between darknet markets and social media drug trading in New Zealand. However, findings were based on a small sample of interviews, including only two 'darknet social dealers'. As such, there remains considerable scope to explore the impacts of this overlap between different forms of digital drug market in New Zealand. It is likely that darknet-sourced drugs are often resold via social media or encrypted messaging apps in a more commercial capacity. This may represent a valuable avenue for future research in New Zealand, given the potential for this trend to have considerable impact on established local drug market dynamics.

It might also be valuable to explore the use of specific platforms and apps for drug trading in New Zealand in more depth. Facebook and Snapchat were the most frequently used for drug purchasing among NZDTS respondents in Chapter 5 by a considerable margin. However, their function as drug markets is likely only partially explored in this thesis (See Section 10.5). Of particular importance is the exploration of how more commercial social media drug market sellers are facilitated on these platforms. Facebook may represent a particularly valuable candidate for future research on social media drug trading in New Zealand. This statement reflects several factors. Firstly, the platform's high level of use in the New Zealand population, and link to New Zealand's dominant messaging app, Messenger. Secondly, changing patterns of social media engagement among younger New Zealanders (Grieve, 2022), may mean that Facebook-based drug trades involve different demographic groups to those featured in this thesis, such as older age groups. Finally, low risk perceptions around cannabis (Chapter 8), and documented challenges to accessing medicinal cannabis in New Zealand (e.g., Clark-Dow, 2022; Hutton, 2022b) may make

Facebook/Messenger a valuable case study of interplay between different drug market groups, seller types and legal/illegal supply chains. Appropriate methodologies in this instance may involve the digital mapping of different selling groups (medicinal or otherwise) and their relation to one another alongside survey and participant observation methodologies.

This thesis also raises potential avenues for future research beyond New Zealand. For example, a sizeable number of participants in this study identified as female (n=10). Though not contextualised as part of research findings, it may be that people's experiences of social media drug markets and their rationales for engaging with these spaces differ by gender. A recent paper from Bakken and Harder (2022) evidences how Instagram provides female cannabis influencers with a platform through which to challenge dominant social and cultural images of cannabis consumption and culture. In line with these findings, a valuable avenue for future research may be the navigation of gender (female and LGBTQ+) as part of social media drug markets.

Though this research project has touched on broader engagement with drug-related content on social media, this issue warrants more in-depth consideration, particularly in relation to the targeting of content and advertising on social media, which is likely to have implications for digitally mediated drug access. Broadly, there remains a lack of research on whether people who use drugs experience or notice targeted adverts for drug-related products, help or information services, or for substances falling under alternative regulatory frameworks that can be exploited to facilitate open advertising (Rychert & Wilkins, 2016). One such example is nitrous oxide (NOS, 'nangs'), which is reportedly advertised on social media platforms like Facebook and Instagram through targeted third-party advertising purporting to sell the cannisters as catering and baking products (MacDonald, 2021). An important avenue for future research may therefore be the broader mapping of how people are targeted by drug related content on social media, with particular focus on the availability and marketing of nitrous oxide and how this translates into purchasing behaviours.

There is considerable potential for the continued growth of social media drug trading in the future given iterations of this digital technology are likely to remain integral to the lives of younger generations as they age into local drug markets. As such, continuing to develop academic understanding of social media drug markets as they evolve is important. As part of this understanding, researchers should be mindful of social media drug markets as both globally and locally shaped, not just by unique drug market trends, but by the characteristics and practices associated with a broader, dynamic, and complex social media landscape. This project has sought to build a foundation from which this can occur in New Zealand.

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Appendices

Appendix A: Statements of contribution




STATEMENT OF CONTRIBUTION

DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the student and the student's main supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the student's contribution as indicated below in the Statement of Originality.



Student name:	Robin van der Sanden		
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In which chapter is the manuscript/published work?	Chapter 5		
Describe the contribution that the student and members of the supervisory team have made to the manuscript/published work: ¹			
Study design (together with supervisory team), planning analysis (together with supervisory team), interpretation of logistic regression results (together with primary supervisor), literature review, writing - initial draft (except analysis section, which was written by the statistician), writing - editing and revisions based on supervisory and peer reviewer feedback, responding to peer review.			
Please select one of the following three options:			
<input checked="" type="radio"/>	The manuscript/published work is published or in press Please provide the full reference of the research output: van der Sanden, R., Wilkins, C., Romeo, J. S., Rychert, M., & Barratt, M. J. (2021). Predictors of using social media to purchase drugs in New Zealand: Findings from a large-scale online survey. <i>International Journal of Drug Policy</i> , 98, 103430. https://doi.org/10.1016/j.drugpo.2021.103430		
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<input type="radio"/>	It is intended that the manuscript will be published, but it has not yet been submitted to a journal		
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Please select one of the following three options:			
<input checked="" type="radio"/>	The manuscript/published work is published or in press Please provide the full reference of the research output: van der Sanden, R., Wilkins, C., Rychert, M., & Barratt, M. J. (2022). The Use of Discord Servers to Buy and Sell Drugs. <i>Contemporary Drug Problems</i> , 49(4), 453-477. https://doi.org/10.1177/00914509221095279		
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Student's signature:	 Robin van der Sanden <small>Digitally signed by Robin van der Sanden DN: cn=Robin van der Sanden, o=MZ, email=robin.vandersanden@vodafone.co.nz Date: 2023.10.12 14:15:41 +1300</small>	Main supervisor's signature:	 Chris Wilkins <small>Digitally signed by Chris Wilkins DN: cn=Chris Wilkins, o=MZ, ou=SHORE and Whariki Research Centre, ou=Massey University, email=c.wilkins@massey.ac.nz Date: 2023.10.21 10:23:29 +1300</small>

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Name and title of main supervisor:	A/Prof Chris Wilkins		
In which chapter is the manuscript/published work?	Chapter 7		
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Conceptualisation of study, design of methodology, data collection (recruitment, interviewing), thematic analysis, literature review and theoretical scoping of paper, writing - initial draft, writing - revisions and editing based on supervisory and peer review feedback, responding to reviewers.			
Please select one of the following three options:			
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Student's signature:	Robin van der Sanden <small>Digitally signed by Robin van der Sanden DN: cn=Robin van der Sanden, o=MZ, email=robin.vandersanden@massey.ac.nz Date: 2023.10.12 14:17:35 +1300</small>	Main supervisor's signature:	Chris Wilkins <small>Digitally signed by Chris Wilkins DN: cn=Chris Wilkins, o=MZ, ou=SNORC and Whariki Research Centre, ou=Massey University, email=ch.wilkins@massey.ac.nz Date: 2023.10.21 10:22:32 +1300</small>
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Name and title of main supervisor:	A/Prof Chris Wilkins		
In which chapter is the manuscript/published work?	Chapter 8		
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Please select one of the following three options:			
<input checked="" type="radio"/>	The manuscript/published work is published or in press Please provide the full reference of the research output: van der Sanden, R., Wilkins, C., & Rychert, M. (2023). "I straight up criminalized myself on messenger": law enforcement risk management among people who buy and sell drugs on social media. <i>Drugs: Education, Prevention and Policy</i> , 0(0), 1-13. https://doi.org/10.1080/09687637.2023.2224497		
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Student's signature:	 Robin van der Sanden	Main supervisor's signature:	 Chris Wilkins
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We, the student and the student's main supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the student's contribution as indicated below in the Statement of Originality.			
Student name:	Robin van der Sanden		
Name and title of main supervisor:	A/Prof Chris Wilkins		
In which chapter is the manuscript/published work?	Chapter 9		
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Please select one of the following three options:			
<input checked="" type="radio"/>	<p>The manuscript/published work is published or in press</p> <p>Please provide the full reference of the research output: van der Sanden, R., Wilkins, C., Rychert, M., & Barratt, M. J. (2023). Social Supply and the Potential for Harm Reduction in Social Media Drug Markets. <i>Contemporary Drug Problems</i>, 50(3), 00914509231178940. https://doi.org/10.1177/00914509231178940</p>		
<input type="radio"/>	<p>The manuscript is currently under review for publication</p> <p>Please provide the name of the journal:</p>		
<input type="radio"/>	<p>It is intended that the manuscript will be published, but it has not yet been submitted to a journal</p>		
Student's signature:	<p>Robin van der Sanden</p> <small>Digitally signed by Robin van der Sanden DN: cn=Robin van der Sanden, c=NZ, email=robin.vandersanden@kiri.mil.nz, Date: 2023.10.12 14:29:16 +13'00'</small>	Main supervisor's signature:	<p>Chris Wilkins</p> <small>Digitally signed by Chris Wilkins DN: cn=Chris Wilkins, c=NZ, o=SHORE and Vihaviki Research Centre, ou=Massey University, email=c.wilkins@massey.ac.nz Date: 2023.10.21 10:23:14 +13'00'</small>
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Appendix B: Overview of key social media and messaging apps ordered by global userbase

Social media	
Facebook	
	<p>Approximate global userbase: 2.93 billion active users in October 2022 (Newberry, 2023b)</p> <p>Platform-owning company: Meta</p> <p>Description: Launched in 2004 as a US College-only social network. Expanded to allow sign up globally in 2006. Facebook is the most long standing SNS-style social media. Users sign up by creating a personalised profile and then sending friend requests to people they know as part of their families, school classes, hobbies, jobs, etc to create a visible social network (e.g., Donath & boyd, 2004). Users can then use a variety of tools to communicate with and maintain these social networks (e.g., status updates, wall posts, likes, comments, messages (see Messenger under Messaging apps), and stories). The platform can also be used to form or join groups (Facebook groups, as opposed to Messenger groups).</p> <p>Documented drug market dynamics: Has been linked to the formation of competitive drug selling groups using the Facebook groups function above, with sellers creating ‘anonymous’ profiles to advertise to customers (Demant et al., 2019) (see also the Messenger app).</p> <p>Notable security features for drug trading: Some potential for group administrators to ‘vet’ group members and ban those who misbehave (Demant et al., 2019). But the platform lacks security features like self-deleting data. Notably, Facebook is linked to a ‘real name policy’ (e.g., Van der Nagel, 2017), where people are required to create accounts which represent their non-digital identities (though this doesn’t preclude the use of a pseudonymous account name). The platform also requires input of a phone number when signing up.</p>
Instagram	
	<p>Approximate global userbase: 2 billion active users in October 2022 (Newberry, 2023a)</p> <p>Platform-owning company: Meta</p> <p>Description: Launched in 2010 as an ‘image-based’ social network (Lee et al., 2015). Users sign up by creating a personalised Instagram page. They can then post photos (or videos), which are collated on their personal pages, but also broadcast to their ‘followers’ via a continually updated newsfeed. The platform was purchased by Meta (previously Facebook) in 2012 and has since broadened to include features such as stories, an ability to post video content (“reels”) and an in-platform messaging function.</p> <p>Documented drug market dynamics: Instagram has been linked to anonymous seller pages/profiles. Photos or stories of stock are easily posted, and new buyers can be located by using</p>

	<p>in-app search functions, account recommendations, and hashtags (e.g., McCulloch & Furlong, 2019).</p> <p>Notable security features for drug trading: The platform can be easily used to create multiple (pseudonymous) accounts, and users can post private stories for ‘close friends’ only. Additionally, the in-app messaging function allows users to limit the number of times others can view sent content like videos or photos by allowing a single replay for example. But messages must be manually unsent and are not end-to-end encrypted.</p>
Snapchat	
	<p>Approximate global userbase: 557 million active users in January 2022 (Dean, 2022)</p> <p>Platform-owning company: Snap Inc.</p> <p>Description: Launched in 2011, Snapchat is a social media-messaging app hybrid platform based around self-deleting of temporary data (e.g., Bayer et al., 2016). Users can send both photo-based (“snaps”) and text-based messages to people they have added as friends, adjusting how long the content remains visible to the recipient. Snapchat pioneered the “stories” feature, where users can post video or photo content which remains visible to their app-based contacts for only 24 hours (Hern, 2017). The platform facilitates the creation of group chats, and the “Snapmaps” feature allows users to share their live location with their contacts each time they open the app. The platform also allows users to add third-party plug ins like Bitmoji (a personalised emoji-creating app).</p> <p>Documented drug market dynamics: Snapchat appears commonly used for drug trading in comparison to other social media (McCulloch & Furlong, 2019; Moyle et al., 2019). It has been linked to a similar anonymous selling profile dynamic to Instagram (McCulloch & Furlong, 2019). Additionally, the platform can be used to facilitate ‘semi-public’ drug market dynamics (Bakken & Demant, 2019), where a seller uses the platform to advertise solely to trusted buyers.</p> <p>Notable security features for drug trading: The app hosts several features which make it a reasonably secure choice for drug trading. Self-deleting data is the default setting on Snapchat, though text-based messages can be more easily saved than “snaps”. The platform also alerts users if screenshots are taken by message recipients. Users can sign up based on a username, enabling a level of anonymity if using the platform for drug trading. Additionally, “stories” can be set to private and shared with specific contacts only. Notably, the platform is also reasonably popular, and therefore convenient and inconspicuous.</p>
Discord	
	<p>Approximate global userbase: 150 million monthly active users in August 2022 (Hadji-Vasilev, 2022)</p> <p>Platform-owning company: Discord Inc.</p> <p>Description: Originally launched in 2015 as a voice-calling app for gamers, Discord has more recently styled itself as a more</p>



general virtual community ‘hangout’. On Discord, users create communities called “servers”, which can be heavily customised by their creators to include different layouts, features and levels of accessibility. The servers can be joined via a valid ‘invite-link’, which allows users to view, join and interact with other server members, via voice, or video call and messaging (group or one-to-one). Platform sign up is anonymous, but accounts must be linked to a valid email address.

Documented drug market dynamics: No current academic scholarship on the use of Discord for drug trading has been published. However, media reports in New Zealand (Anonymous, 2020; Harris, 2021) and Australia (James, 2021), indicate that the platform may be used to facilitate large, competitive drug markets which resemble Facebook selling groups (see above).

Notable security features for drug trading: Discord’s primary security feature is the ease with which an anonymous account can be created. Additionally, an ability to form private servers may also be a security advantage of social media drug trading on this platform (i.e., servers which are not searchable to others, and are only accessible via temporarily valid invite-links, which can be tightly controlled by server creators).

Messaging apps

WhatsApp



Approximate global userbase: 2 billion active users in October 2022 (Hootsuite, 2022)

App-owning company: Meta


Description: WhatsApp was the first mobile messaging app launched in 2009 and acquired by Meta in 2014. It not constitutes the world’s most popular messaging app (March, 2023). The platform enables both one-to-one and group messaging as well as video and voice calling, with users also able to post temporary stories or “status updates”. All communications on WhatsApp are automatically end-to-end encrypted.

Documented drug market dynamics: Research has indicated WhatsApp (alongside other ‘secure’ messaging platforms) is often used by sellers to arrange drug transactions with buyers recruited via more ‘public’ social media platforms like Instagram or Facebook. It is likely also used in one-to-one ‘private’ drug market trades between people who already know one another (Bakken & Demant, 2019), and to create selling groups (see Telegram below).

Notable security features for drug trading: The automatic end-to-end encrypting of communications on WhatsApp makes it a more secure messaging app than Messenger (see below). Additionally, message timers can be set on WhatsApp for both one-to-one and group chats. However, platform sign up is based on a phone number.

Messenger

	<p>Approximate global userbase: 1 billion active users in July 2022 (Beveridge, 2022; Datareportal, 2022)</p> <p>App-owning company: Meta</p> <p>Description: Messenger was originally part of the Facebook platform (“Facebook Chat”) but was launched as a separate mobile messaging app in 2011. In 2022, Messenger was the third most popular messaging app (behind WhatsApp and WeChat) (March, 2023). It is the most widely used messaging app in New Zealand at the time of writing (We Are Social & Kepios, 2022). Messenger allows one-to-one and group messaging as well as video and voice calling. However, users must be logged into the app via an existing Facebook account. In 2016, Messenger launched a “Secret chats” feature, which enables users to create one-to-one end-to-end encrypted chats with others, though secret group chat functionalities currently remain limited.</p> <p>Documented drug market dynamics: There is currently little documentation of the use of Messenger in drug trading, though Moyle et al. (2019) found some evidence it was used for drug trading among their survey respondents. Messenger group chats are likely used to facilitate similar group selling environments to those documented in relation to Facebook groups (Bakken & Demant, 2019) and other messaging apps (Blankers et al., 2021).</p> <p>Notable security features for drug trading: Messenger “secret chats” provide users some ability to end-to-end encrypt their messages and apply message timers. However, the app’s links to a functioning Facebook account and therefore often a “real name” (see above), can lower the security of using the app for drug trading. Additionally, default Messenger settings do not incorporate any notable security features such as end-to-end encryption currently and must be manually deleted.</p>
Telegram	
	<p>Approximate global userbase: over 700 million active users in June 2022 (Singh, 2022)</p> <p>App owners: Pavel and Nikolai Durov (registered as Telegram LLC in the US).</p> <p>Description: Launched in 2013, Telegram is a secure messaging app/social media hybrid which is founded on an ethos of private communication and the facilitation of free speech (Silverman, 2018). The app enables video and voice calling, as well as one-to-one messaging, group messaging and the creation of Telegram “channels”, which can be used to broadcast messages to large groups of subscribers akin to social media platforms like Twitter. The app has become popular with conspiracy theorists and extreme political groups pushed off mainstream platforms in recent years as an “alternative social media” (Rogers, 2020), including in New Zealand (Reeve, 2021).</p> <p>Documented drug market dynamics: Telegram has been documented as facilitating drug selling groups (Blankers et al., 2021). The app has also been linked to the hybrid digital drug</p>

	<p>market Televend, which, while functional, combined a Telegram interface and messaging capabilities with darknet technology to offer vendors a unique, high security direct dealing platform (Barratt et al., 2021).</p> <p>Notable security features for drug trading: Telegram allows the use of usernames to message others on the platform, but a phone number is required on sign up to validate user accounts. Notably, Telegram messages are not end-to-end encrypted by default, with users having to switch to a Telegram “secret chats” function to ensure end-to-end encrypted communication. However, the app does enable auto-delete functions on messages, and the use of message-timers. Telegram is renowned for its refusal to cooperate with government requests for user data, though some argue this may not reflect the app’s actual practices (e.g., Walker, 2021).</p>
Signal	
	<p>Approximate global userbase: 40 million active users in December 2021 (Curry, 2023)</p> <p>App-owning company: The Signal Foundation</p> <p>Description: Launched in 2014 Signal is an end-to-end encrypted messaging application focusing on enabling free, private communications. The app bears similar functionalities to WhatsApp, with users able to chat one-to-one, in groups and post ‘stories’ to their Signal accounts. But Signal is renowned as more secure owing to its non-profit ownership by privacy advocates The Signal Foundation, and additional features such as hidden metadata on encrypted messages (Johnson, 2022; O’Flaherty, 2021). Sign up is based on a phone number.</p> <p>Documented drug market dynamics: There is little documentation on the use of Signal for drug transactions specifically. However, it is a so-called “privacy-centric” messaging app, bearing similarities to other such apps which have been documented in relation to social media drug trading (See Telegram above, and Wickr below). This association means Signal is a likely candidate for drug selling groups or one-to-one transactions.</p> <p>Notable security features for drug trading: All Signal messages are end-to-end encrypted by default, and the platform enables users to select from a range of message timers. However, sign up requires a phone number, which may be shared with others on the platform when messaging or calling.</p>
Wickr	
	<p>Approximate global userbase: No current data on the number of active users.</p> <p>App-owning company: Amazon Web Services (ASW)</p> <p>Description: Wickr (alternatively known as Wickr Me), is a secure messaging app offering end-to-end encrypted anonymous group and one-to-one messaging and voice calling. The app was launched in 2011 and purchased by ASW in 2021. ASW have recently announced they are shutting down the app from December 2023 (Marcelline, 2022). Reports suggest this</p>



decision may reflect controversies surrounding the app and its role in facilitating criminal activities ranging from hacking to child pornography and drug dealing (Goggin, 2022).

Documented drug market dynamics: Existing research has indicated Wickr may be frequently used for drug trading in comparison to other encrypted apps (Moyle et al., 2019). Sellers operating on social media like Instagram often direct buyers to Wickr to make purchases (Bakken & Demant, 2019), and the app is also frequently used by drug vendors on the darknet for direct dealing purposes (Childs et al., 2020). Additionally, 'private' drug trading dynamics involving buyer and seller who are known to one another have also been documented (Demant et al., 2019).

Notable security features for drug trading: Wickr facilitates anonymous sign up without the need to add a mobile number for account verification purposes. It also automatically end-to-end encrypts all messages and automatically applies message timers of six days to chats, which can be further customised by users.

Appendix C: NZDTS 2020 open-text field responses – perceived advantages of social media purchasing (paraphrased themes)

Open-text field theme (paraphrased)	Frequency of responses (N=162)
“Normal way to sell these days’/convenient/fast/always available”	54
“Easy to message friends”	44
“Increased safety and community”	38
“No advantages/inconvenient/more dangerous”	11
Irrelevant responses (e.g., jokes, YouTube links, etc.)	15

Do you use **social media** to buy or access **illegal drugs**?

A **Massey University PhD student** is looking for participants to take part in a research project examining the role of social media in illegal drug markets in New Zealand.

Participation involves **totally anonymous, confidential** online interviews via the encrypted app **Wickr Me**. Participation is voluntary. You will be offered a **supermarket voucher** for your time.



You must be 16+ to participate and have some experience using social media for drugs in NZ!

Want more information?

Send me a message on **Wickr** (free download from all good app stores)

Wickr ID: **rvdsmassey**

Or email:

r.vandersanden@massey.ac.nz

Appendix E: Online interviews participant information sheet



SHORE & Whāriki Research Centre, College of Health, Massey University
PO Box 6137, Victoria Street West, Auckland 1142, New Zealand
Phone: +64 9 366 6136 Fax: +64 9 366 5149
Email: shore&whariki@massey.ac.nz

Exploring social media markets for illegal drugs in New Zealand

Information sheet for online interview participants

Kia ora,

My name is Robin, and I'm studying towards a PhD in Public Health with SHORE & Whāriki Research Centre at Massey University in Auckland. This project aims to look at how social media is being used to buy, sell, trade, share or generally obtain or supply illegal drugs among recreational drug users in New Zealand, and is part of a wider SHORE & Whāriki research project, funded by the Royal Marsden Fund, examining the impact of online darknet markets in New Zealand. This project is being supervised by Associate Professor Chris Wilkins (SHORE & Whāriki, Massey University), Dr Marta Rychert (SHORE & Whāriki, Massey University) and Dr Monica Barratt (RMIT, Melbourne).

Project Description and Invitation

This project aims to explore the under-researched place and role of social media in illegal drug markets in New Zealand. My focus is on how people's experiences with social media drug markets might be different to their experiences accessing illegal drugs in other ways (using darknets or buying from a tinny house for example), and whether using social media to access drugs has an impact on people's drug-use habits and perceptions of drug use and drug supply. The findings will inform harm reduction initiatives, policy and law responses aimed at reducing the harm of drug use and drug markets in New Zealand. So, what counts as participating in a social media drug market? In the scope of this project I'm interested in all kinds of participation in social media drug markets on all kinds of social media platforms, apps, websites, forums or otherwise. Do you have experiences buying, obtaining, trading, sharing, brokering, selling or supplying illegal drugs through social media? Then I'm interested in chatting to you.

Participation criteria:

- You must be 16 or older;
- You must have spent the last 6 months living in New Zealand;
- And you must have participated in a social media drug market at least once in the past 6 months;

If you meet these criteria, then I would hereby like to invite you to participate in this research.

Participant Recruitment and Project Procedures

This part of the project is being advertised on social media, and involves **two phases** that participants may be involved in. In **phase one**, participants will be invited to take part in an online interview using the chat app Wickr (alternatively known as Wickr me). Wickr uses military-grade encryption and allows you to send messages without exchanging phone numbers, instead you can message me using a Wickr ID of your choosing, and you can change this anytime. Messages can also be set on message-timers where they are automatically deleted after a certain amount of time has passed, so you don't need to worry about chat logs hanging around after your interview is completed. Using Wickr your personal information won't be known to me, and you won't need to worry about what you say leaving our chat or being kept on Wickr servers. Online interviews will take approximately an hour of your time and can be scheduled at a time that works for you. I will ask you questions around your involvement and experiences with social media drug markets, and how this might compare to experiences you've had getting illegal drugs in other ways (for example from the darknet or a tinny house), as well as your perceptions of the advantages and disadvantages of using social media in this way.

I may also invite you to take part in a **second phase**, or 'follow-up' interview, which will take place roughly six months after the first interview and approximately 45 minutes of your time. Follow-up interviews may take place on Wickr, or alternatively face-to-face (provided you live in the Auckland region) and be focused on your most recent experiences with social media drug markets in comparison with those discussed in initial interviews. If you consent to a follow-up interview, I will need to store your Wickr ID for a period of 6 months in order to contact you again in the future. Wickr ID's will be stored on a secure server and separate to any transcripts from first interviews and will be assigned a number which corresponds with your first transcript for the purposes of tailoring the follow-up to you and your experiences more specifically. You may withdraw your consent to be contacted for a follow up interview at any point. Recorded Wickr ID's will be deleted as soon as your follow-up interview is scheduled, if you opt out of participating in a follow up, or once six months have passed. In total, your involvement in this research may take about **2 hours** of your time. However, you are under no obligation to take part in both phases of this research, or to take part in either. Your participation in both phases of this research would be greatly appreciated but I recognize that your time is valuable so participation in both interviews is voluntary, and you can message me at any point before the follow-up to withdraw your continued participation. You will be offered a supermarket voucher as reimbursement for your time.

Finally, a note on confidentiality, participant anonymity and your data: I recognize that the information I am asking you to share with me is sensitive, and as a result **I don't want to know any specific details about people, places, times or locations**, so that neither you nor anybody you refer to can be identified at a later date. Please feel free to be honest as nothing you say can be traced back to you. I will not record any of your personal details, and though I will need you to indicate your consent to my use and recording of the data you provide in the interview, you won't need to record your name when doing so. I will ask you for some demographic details like your age, gender, and ethnicity for example, but as a participant you may decline to provide this information at any time and are not obliged to answer my questions or complete the interview. Note, interviews will be carried out in English.

Your Rights as a Participant

You are under no obligation to accept this invitation to participate in this research. If you do decide to accept, you have the right to:

- Decline to answer any particular question;
- Ask the researcher any questions about the study at any point during your participation;
- Stop the interview at any point by closing the Wickr chat on your computer or phone;
- Withdraw from the study (up to three weeks after the interview);
- Provide information on the understanding that your username or personally identifiable information will not be used in this research;

- Be given access to an interview transcript;
- Be given access to a summary of the project findings.

What happens to your data?

Interviews will be transcribed by me. You will be given a pseudonym, and I will remove any potentially identifiable information from your transcript to ensure that the resulting data cannot be linked back to you. You will have the right to view and edit a transcript if you would like, and this will be sent to you via Wickr. You will have two-weeks from receiving a copy of the transcript to edit or make changes and you will need to indicate (via Wickr) that you approve it being used for research purposes. Transcripts will be stored in a password protected environment only accessible to myself and my supervisors. Your data will not be used outside for any research purpose outside of this project. All data will be destroyed after 5 years.

The findings of this research will be published in peer-reviewed articles in academic journals and will be included in my PhD thesis. A summary of project findings will also be accessible to participants if interested. A weblink to will be posted to the New Zealand Drug Trends Facebook page or you can opt to have a link sent to you via Wickr.

Thanks for your time. I really appreciate it.

If you would like to speak to someone regarding alcohol and drug use problems, please contact:

Alcohol & Drug Helpline	0800 787 797
CareNZ	0800 682 468
Lifeline	0800 543 354
Youthline	0800 376 633

Project Contacts

Please feel free to contact either myself, or my supervisor Marta with any queries or for more information.

Researcher:

Robin van der Sanden

Wickr ID: [rvdsmassey](#)

Email: r.vandersanden@massey.ac.nz

Supervisor:

Dr. Marta Rychert

m.rychert@massey.ac.nz

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application 20/22. If you have any concerns about the conduct of this research, please contact Dr Negar Partow, Chair, Massey University Human Ethics Committee: Southern A, telephone 04 801 5799 x 63363, email humanethicsoutha@massey.ac.nz.

Appendix F: Online interviews: Copy/paste interview protocols

- a) **Initial contact RV/participant:** Initial contact between RV and potential participants via Wickr (prior to confirmed participation). Participant eligibility will be double-checked for key criteria after they have read the participant information page, and before an interview is scheduled.

Thanks for your interest in participating in this study 😊! Here is a link to the participant information page <insert link>. Please read it carefully, and if you are still interested in taking part get back to me via Wickr, and we'll set up an interview time!

- b) **Eligibility check:** RV will double check participant eligibility immediately after they indicate having read the participant information and before proceeding with the scheduling of an interview.

Great! Can you just confirm for me that you are aged 16 or over, and have some experience using social media to buy and/or sell drugs in New Zealand?

Participant: *Indicates yes/no*

Awesome, let's schedule an interview time 😊

- c) **Ask participant to indicate whether they would like to view a transcript:** At time of interview, participants will be asked to indicate whether they would like to receive a transcript prior to the interview commencing. RV will record their reply at the top of the interview notes file.

Could you confirm for me whether you would like to receive a copy of your transcript for editing after the interview is completed?

Participant: *Indicates yes/no.*

- d) **Provide participant with option of receiving a voucher:** Prior to completing the informed consent protocol participants will be given the option of receiving a supermarket voucher as reimbursement for their time. RV will record their reply at the top of the interview notes file and arrange post-interview if applicable.

I would also like to offer you a \$30 Countdown voucher as reimbursement for your time and effort in participating in this research, but you're not obligated to accept that if you don't feel comfortable doing so.

Participant: *Indicates yes or no*

(if yes)

Great, we'll sort that out at the end of the interview if that's okay with you as I'll need you to send me a burn-on-reading message with a postal address where you feel comfortable receiving the voucher (I don't need a name and the address doesn't have to be your own). I don't keep that information at all beyond writing it on an envelope and posting the voucher off.

(if no) Okay, feel free to let me know if you change your mind.

- e) Interview consent:** This text will be copy/pasted into the Wickr chat box after protocol b) has been completed. The consent statement and participant response will be recorded at the start of the interview transcript.

So the last thing I need from you before we start is for you to indicate that you consent to be interviewed. I'm going to pop a consent statement into the chat and I just need you to reply with something along the lines of 'I agree' to kick us off 😊

Consent statement:

I have read and understand the participant information sheet. I understand participation is voluntary and I can choose not to answer any questions and withdraw from the study for up to three weeks after the interview has taken place.

Participant: Indicates "I agree/disagree" OR "yes/no"

- f) Closing comments and follow-up:** Once the online interview has ended RV will send the following message texts to participants. Participants will be asked if they will allow their Wickr handles to be securely stored for a period of six months for follow up interview purposes. If participants indicate 'yes' they will be send the information below including explanation of how Wickr usernames will be stored. If they indicate 'no' they will be sent only the last paragraph on data storage and use.

Thanks so much for your time and effort, this has been really useful! I'm going to end the interview here, but I'm also going to send you a bit more information about data storage and transcripts, etc if that's okay with you.

Due to an already large number of participants, I'm no longer asking people to participate in a follow up interview in six months' time (as was indicated in the participant information), so this will be the extent of your participation. However, feel free to message me on here if you have any questions about the research or your participation in it at any point in the future!

Would you be interested in being contacted for a follow-up interview in six months' time?

Participant: Indicates yes/no

*(if **yes** send full text below, if **no** only send the last paragraph)*

Wickr ID's will be stored for follow-up on a password-protected, standalone server, and will be kept on a password-encrypted file to which only I have the decryption key. I will need to assign your Wickr ID a number that corresponds to your first transcript for the purposes of tailoring your follow-up interview, but actual transcripts will be stored separately. You are under no obligation to take part in a follow-up interview, and you may withdraw your consent to be contacted for a follow-up at any time.

Your data from this interview will be stored on a standalone online server accessible only to me and my supervisors and will be used in a series of scholarly articles, which will form the basis of my PhD thesis. A link to a summary of project findings will be available on the New Zealand Drug Trends Facebook page or I can send you a link via Wickr. If you have requested a copy of your transcript this will also be sent via Wickr.

Your Wickr ID will be deleted from my Wickr contacts three weeks after the completion of your interview in line with the withdrawal period for this study. Note, this will not prevent you from being able to message me if you have any issues or queries about your participation after this time.

- g) Interview transcript release statement:** If participants indicate that they want to receive a copy of the transcript for editing, this will be sent to them in the days after the interview (applicable to both initial interviews *and* follow-up interviews, online or offline). The transcript will be sent with a transcript release form, which will require participants to release the transcript via a statement included in our Wickr chat log, and not via signature.

I'm sending your transcript through to you now along with a PDF form including details of how you can approve my use of your transcripts if and when you are happy with them. I recommend you download the PDF so that you still have a copy for reference when or if this message is deleted. You have two weeks from now to review the transcript and make any edits. Please highlight any edits you make (no tracked changes, as I don't want to know your identity). When you are finished, or if you are happy with the transcript please send it back to me via Wickr, along with the statement included in the transcript release PDF. As a final piece of housekeeping: Please do not share this transcript with others! Feel free to message me if you have any questions!

Additional protocols:

- 1) **Message reminder for prospective participants interested in an initial interview:**
If interest is expressed in interview participation but a prospective participant stops replying during the interview scheduling phase (protocols a, b and c) a reminder message will be sent after approximately four days (prior to the expiration of the timer on their first message) to check whether they are still interested in participating. This message will be sent once.
- 2) **Transcript release reminder:**

In cases where the two-week transcript release window is passing participant will be sent one reminder message approximately two days prior to the end of the transcript release period.

3) Dealing with instances where interviews are unable to be scheduled due to high demand:

This protocol was added to address the large volume of messages received from KYS advert respondents, which outpaced my ability to complete interviews.

- a) Send participant information and then wait for participants to confirm interest and eligibility.
- b) Once confirmed, send the following message:

a. Awesome, thanks for that. Due to high levels of interest at the moment, I'm unable to schedule anymore interviews right now. Can I keep your Wickr handle on file for a bit and sent you a message in the coming weeks to schedule an interview?

- c) If the prospective participant consents their username will be recorded in the temporary Wickr handle storage log. All recorded usernames will be color-coded according to whether an interview has been scheduled. As respondents are reconnected with and interviews carried out their names will be deleted from this document.

Appendix G: Main Online interview schedule

Scheduling and consent (*Before interview is scheduled*)

- a) Transcript
- b) Voucher
- c) Consent

Section 1: Demographics

I'm going to start by asking you for some demographic info, but again you don't have to answer anything you don't feel comfortable answering.

Could you tell me your gender, age, and ethnicity?

And what is your employment status, highest level of education and NZ region of residence?

Section 2: General social media use

In this section I will ask you some questions about your general daily use of social media. In this case social media can be anything from the standard options like Facebook, through to chat apps like Wickr or WhatsApp, dating apps like Tinder and shared servers like Discord for example.

Can you tell me how you use social media in a typical day?

- What apps do you use/prefer? Any you avoid?
- Do you use different apps for different things or different people? (Who do you interact with online?)
- Encrypted chat apps like Wickr?
- Discord?

Section 3: Social media drug markets experience

This section will consider your experiences using social media to access drugs, in terms of the drugs you get, who you get drugs off, what apps you use/have used, and what the transaction looks like.

How did you come to start buying drugs via social media?

- How long ago was this?
- What is a typical social media 'transaction'? (e.g., pick up versus delivery)
- What apps are used? Are there any **preferred** apps for using in this way?
- What drug types are accessed? (If cannabis is used, establish if this use medicinal? This may shape SM use).
- Market role(s)?

Section 4: Sellers on social media

This section focusses on the seller types you might use as part of buying off social media. This includes dealers and people like your friends or social acquaintances.

What type of sellers do you buy from on social media?

- Process of getting contact details?
- How many sellers?
- Do you approach different people on different apps? Do different seller *types* use different apps?
- SM impact on buying (and supplying) drugs? New drug types used because of SM?

Have you ever **supplied** anyone with drugs using social media (e.g. bought for a group, or set friends up with a dealer, etc)

Section 5: Drug use/market trajectories

This section is about your previous experiences (if you have any) buying drugs in ways that didn't involve social media. So going to a Tinny House for example, or buying off someone at a club.

How did you purchase drugs before you started using social media?

- What types of seller/market has been used in the past?
- Drug types?
- How does it compare with social media?

Have you ever **considered using/tried to use/used a darknet market** to buy (or sell) drugs?

- Why/Why not?
- What was the experience like? Will you use it again
- Comparison to social media?

Section 6: Harm reduction and normalization

In this section I'm interested in your opinions of social media drug markets in terms of what you like about them, or what you don't like in comparison with the experiences of getting drugs in other ways that we just talked about. I'm also interested in whether you feel like social media might be changing your drug use habits or those of your friends.

What safety concerns do you have when using social media to buy drugs? How does this compare to physical drug markets (police, violence drug dealers)?

- Advantages and disadvantages? Compared to previous experiences in section 5?

Impact of social media drug purchasing on drug use patterns (if any)? (e.g., change in drug types used, frequency of use, etc.)

Section 7: Privacy on social media

This section is about your privacy in relation to social media drug markets and whether you have any online privacy concerns in your use of social media drug markets.

What types of privacy concern, if any, do you have around engaging with social media for drug trading? (e.g., this could be related to exposure to the police, or other people like employers, stealing of your personal information, etc.)

How do you try to manage these risks when using social media for drugs?

Section 8: Wrap-up and closing comments

Any final comments?

Appendix H: Follow-up schedule (general)

Section 1: Social media drug markets:

This section will consider any new experiences you might have had with accessing illegal drugs through social media in the last six months.

During our last interview we talked about your experiences accessing/buying/selling <INSERT DRUG TYPES> using <INSERT APPS> have you had any more experiences using this or any other social media app in the past six months?

- New apps?
- Changes to app markets already used? (size, vibe, range of products, sellers?)

Section 2: Sellers on social media

This section will consider any new developments in your experiences with and perceptions of social supply in a social media context, any new 'hook-ups' you've used and how you know them/how you bought off them or supplied to them.

In our last interview you indicated you tended to buy/sell drugs off <INSERT SELLER TYPES> using <INSERT APPS>, are you still buying from the same people/dealers?

- New supply connections via socials? **OR** New supply connections *not* on socials? (segway to section 3)

Have you supplied/sold anyone with drugs in the past 6 months? Did you use social media to do this at any point (if so how)?

Section 3: Drug use/market trajectories

This section will consider any other ways you might have accessed illegal drugs in the past six months besides through social media. You can also compare your more recent experiences with social media drug markets to experiences you might have had with other types of drug market longer ago or which you have already told me about in our first interview.

Have you accessed drugs, or **tried** to access drugs in any other ways besides social media in the past six months?

- Market type, drug type, seller type
- Why branch out from SM?

Section 4: Harm reduction and normalization

In this section I'm interested in talking about some of your more general opinions and perceptions of how social media drug markets might be changing how people in general or people you know are accessing drugs and what this might mean for harm reduction and minimization around recreational drug use.

Exposure to **drug-related content** on social media platforms (following drug-related pages/accounts, as well as in-app recommendations of drug-related adverts/content dealer profiles or groups for example, *sponsored or harm reduction content*)

Non-instrumental Interaction with social media drug markets: Do participants spend time 'browsing' or looking at market content/feeds even when not buying/selling?

Section 5: Privacy on social media

This section will touch on the issue of privacy in relation to social media drug markets in a more specific way, directing the participant towards specific facets of what a privacy issue might be within the social media setting.

How do you feel about the collection of your data by social media companies? Is that a concern for you in relation to your use of social media for drugs?

If not featured in initial interview: Are you concerned about people in around you (like family, or colleagues, etcetera) finding out about your drug use via social media? (if yes, what steps do you take to avoid this from happening?)

Section 7: Wrap-up and closing comments

Do you have any further/final comments you would like to make?

Appendix I: Additional information on Discord drug servers used to generate observational data (Chapter 6)

Server 1

Joined: October 2020

Membership (on joining): 300 members approx.

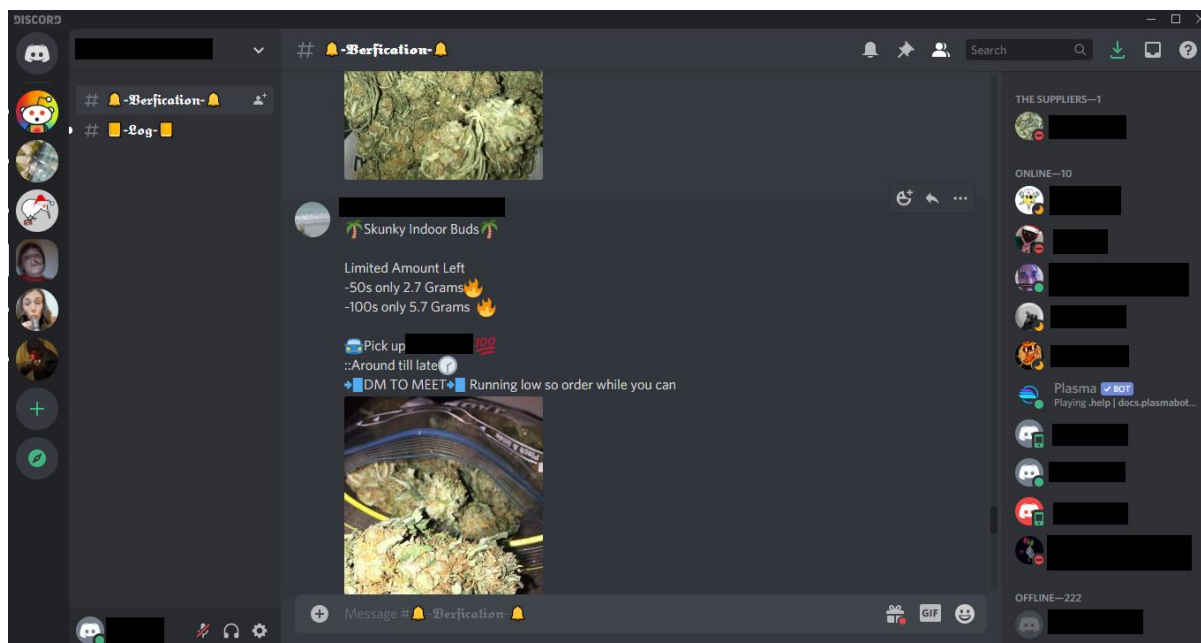
Verification: Yes (image shows server layout prior to receiving verification)

Region: Wellington

Drug types: Mixed

Managed: No

Notes: Server was active on joining but decreased in activity as data collection progressed. This server indicates commonplace server set up where only a welcome or 'verification' channel is visible to members until they have been verified by a server administrator. However, management of this server appeared largely inactive and so verification requests were not often approved. As a result, sellers often advertised in the verification channel.



Server 2

Joined: October 2020

Membership (on joining): 900 members approx.

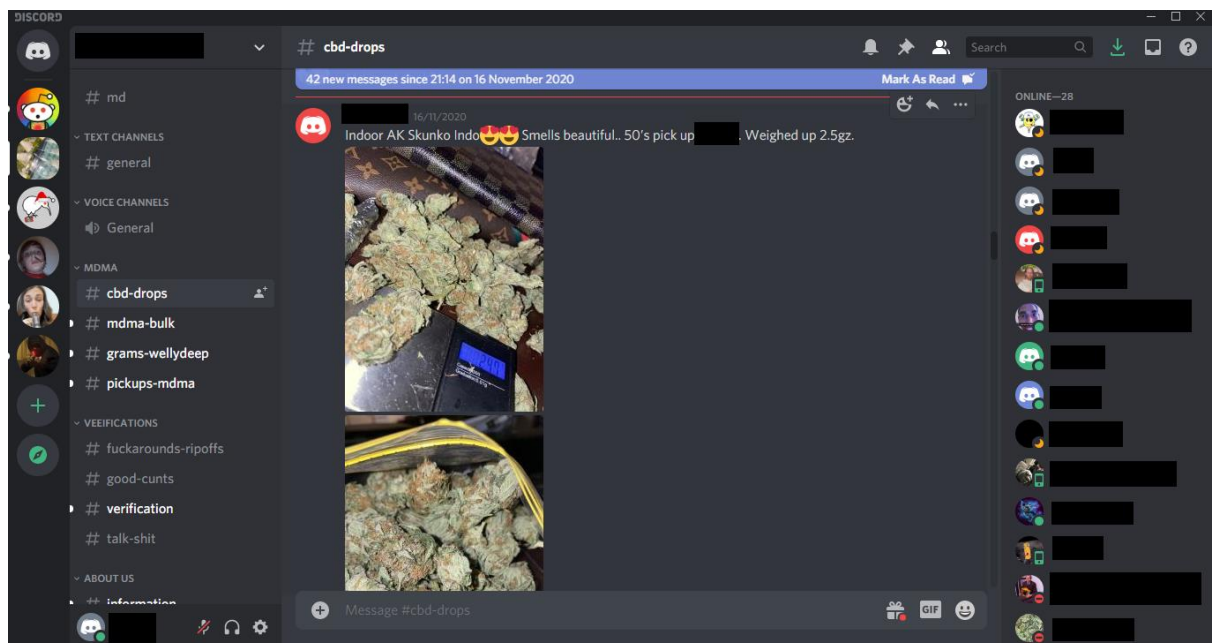
Verification: No

Region: Wellington

Drug types: Mixed, but primarily MDMA

Managed: No

Notes: Another server which was active on joining, but activity declined during data collection period. Server was set up to focus explicitly on the supply of MDMA, but other drug types (like cannabis) were commonly advertised here as well. No clear administrator.



Server 3:

Joined: October 2020

Membership (on joining): Unclear, but likely small (e.g., under 400 members).

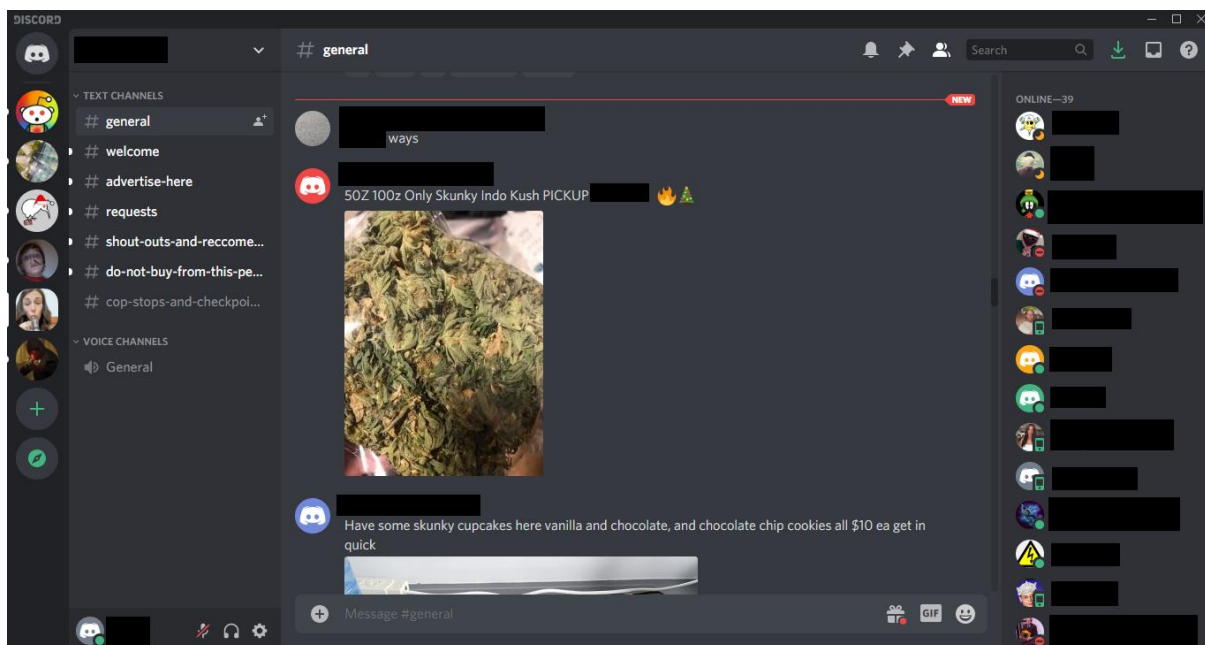
Verification: No

Region: Wellington

Drug types: Cannabis

Managed: No

Notes: Advertised as a cannabis-specific server, but other drug types were also advertised. Very simple server layout with few channels and little information about the server. No clear administrator.



Server 4

Joined: November 2020

Membership (on joining): 900 members approx.

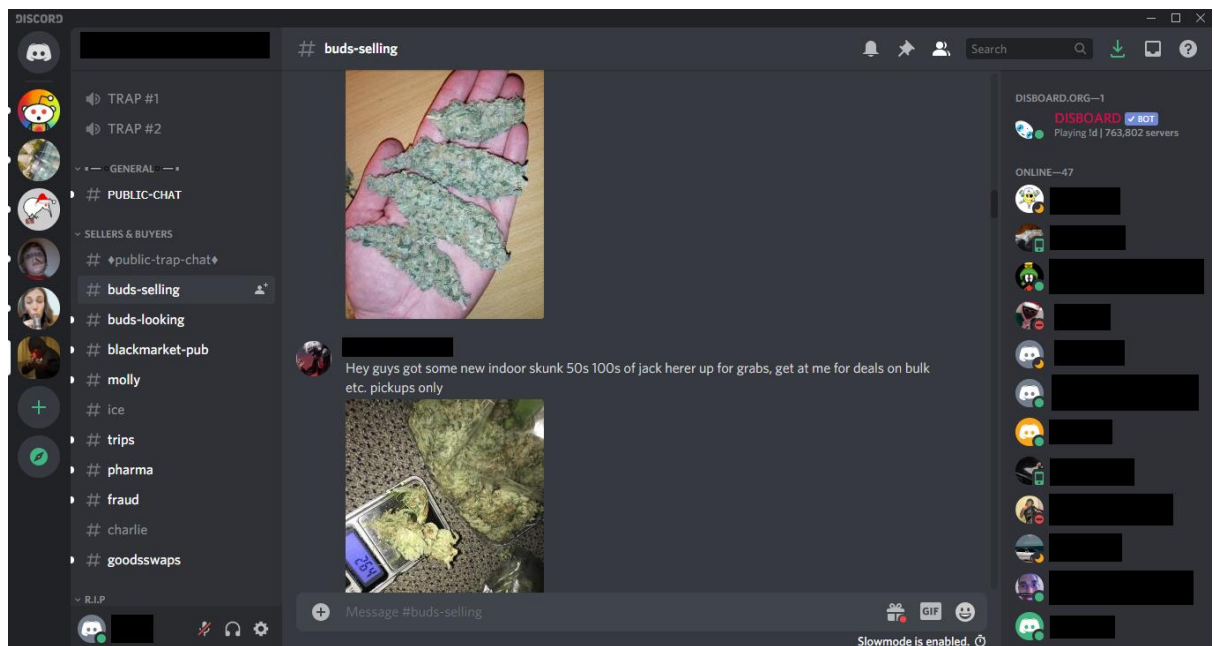
Verification: No

Region: Wellington, but some advertising from Auckland sellers.

Drug types: Misc (including methamphetamine)

Managed: Yes, initially, but decreasing as data collection progressed.

Notes: The first seller-run Discord server. In this case, a seller with an active presence across other drug servers established their own server. The seller used the server channels to advertise their own products, but also allowed other sellers to advertise in the sales channels. The seller took a reasonably active role initially, banning members and responding to scam allegations, but this decreased as data collection progressed. Many server members speculated that this server was run by gangs owing to its anti-police name (obscured in screenshot) and the open sale of methamphetamine on server (the "ice" channel).



Server 5

Joined: December 2020

Membership (on joining): 1,000+ members

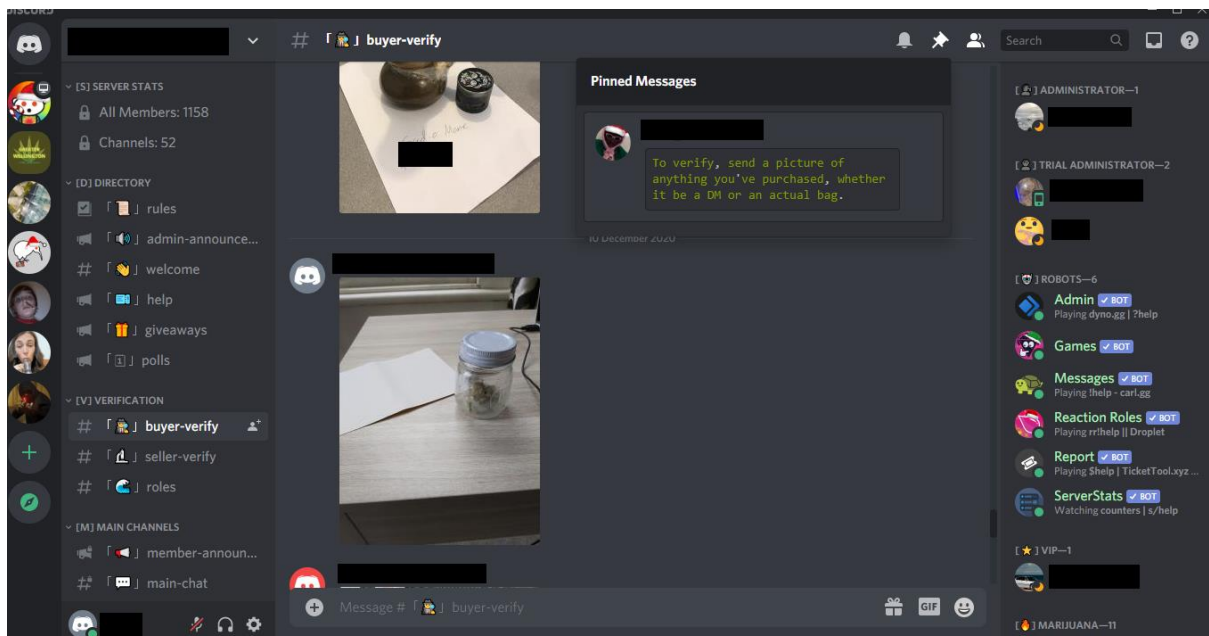
Verification: Yes, but channels not closed on joining.

Region: Wellington

Drug types: Mixed.

Managed: Yes

Notes: Another server run by an active Discord seller who also advertised across other drug servers. The server was advertised across existing servers in order to grow its' buyer and seller base when it was joined, but later became more tightly closed and strictly limited the availability of invite links to 'VIPs' only. Displays a more detailed drug server layout including channels for server 'rules', announcements from the server admin and a 'help' channel.



Server 6:

Joined: February 2021

Membership (on joining): 3,500+ members

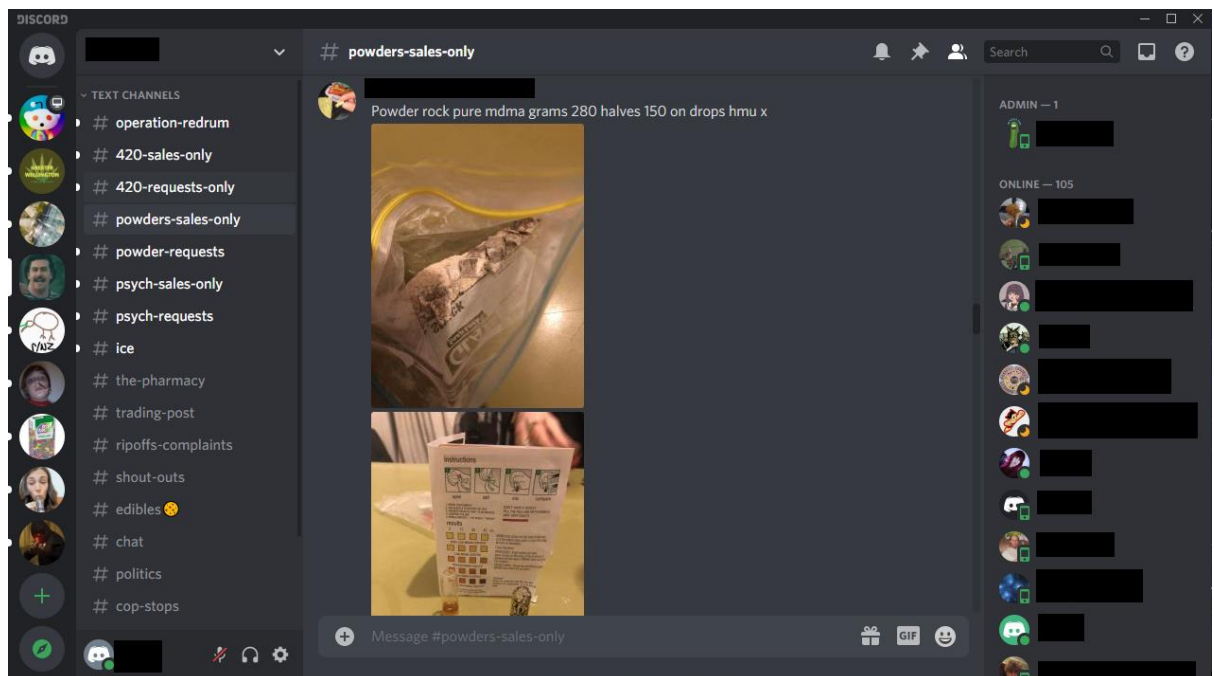
Verification: No

Region: Wellington

Drug types: Mixed (including methamphetamine)

Managed: Yes

Notes: The largest drug server I joined during the data collection period. This server employed a similar pattern of early, rapid growth by making invite links publicly accessible, and then closing off once the server had grown substantially in size. Again, run by a seller who also has an active presence across other servers. During the data collection period this server was actively managed and highly active.



Server 7

Joined: February 2020

Membership (on joining): 1,000+ members

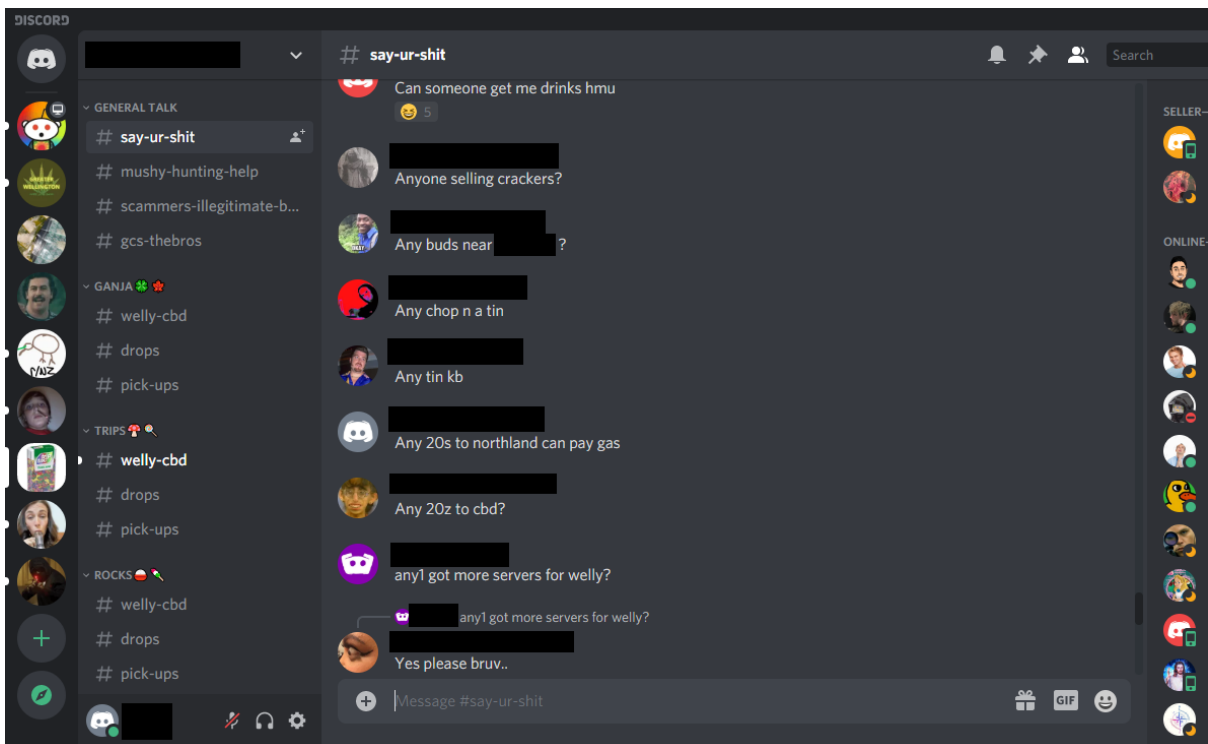
Verification: No

Region: Wellington

Drug types: Mixed

Managed: No

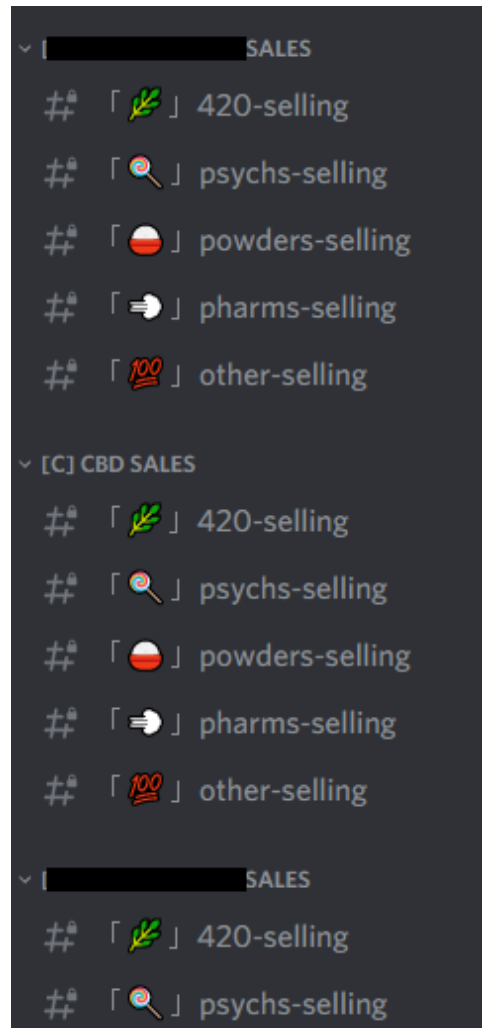
Notes: A largely unmanaged server, with channels set up for pick up and delivery of different drug types across the Wellington region.

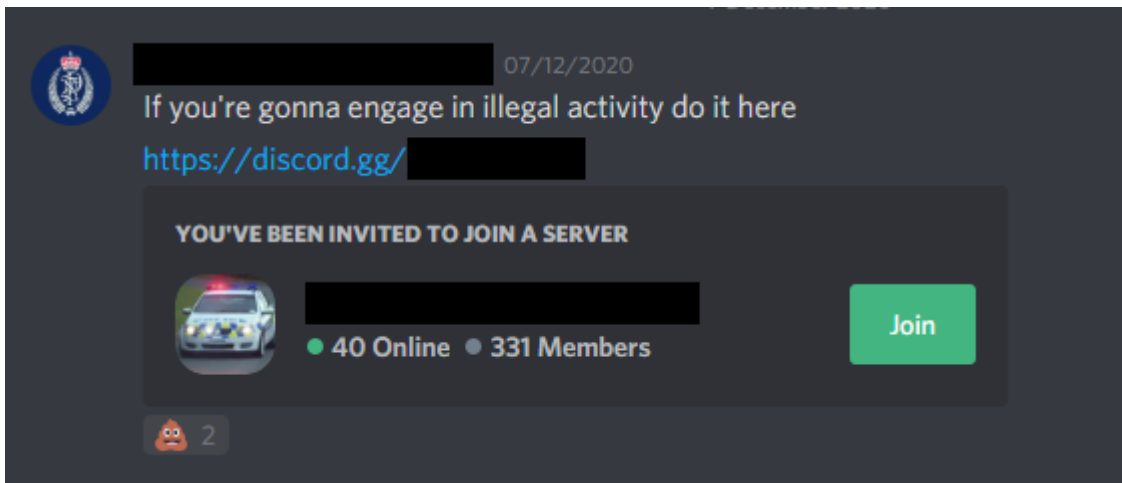
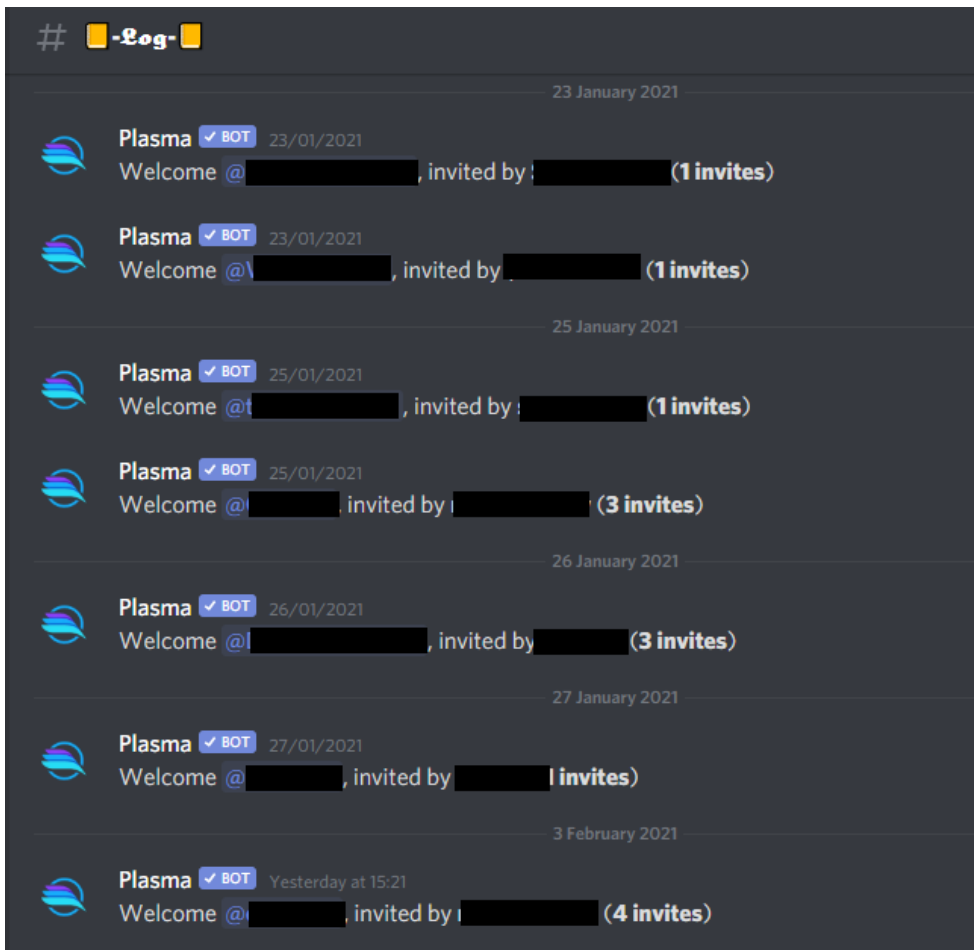



Appendix J: Examples of observational data by category

Category 1: Server layout


See Appendix G for examples of screenshots pertaining to overall drug server layout. Additional data in this category includes examples of general features across drug servers (e.g., organised channels, verification, invite links, use of bots), and administrator announcements or interactions with members that illustrate drug server rules and customisation (e.g., setting of permissions around invite links or adding additional server features like support tickets or roles).






 [Redacted] Random question lol, only use discord for buying- can I add a friend to the group and if so how 😂

10 February 2021

 [Redacted] Possibly negotiable
Atm only vouched can invite

 [Redacted] **A** || @everyone

Welcome to the roles hub!

React with **B** to become a buyer.
(@Buyer)

React with **S** to become a seller.
(@Seller)

React with **Q** to receive QoTD pings. (coming soon)
(@QoTD)


React with **P** to receive poll pings.
(@Polls)

React with **A** to receive announcement pings.
(@Announcements)


These roles are in place to help you with advertising, as well as organise members.

----- (edited)

B 166 **S** 82 **Q** 13 **P** 15 **A** 26

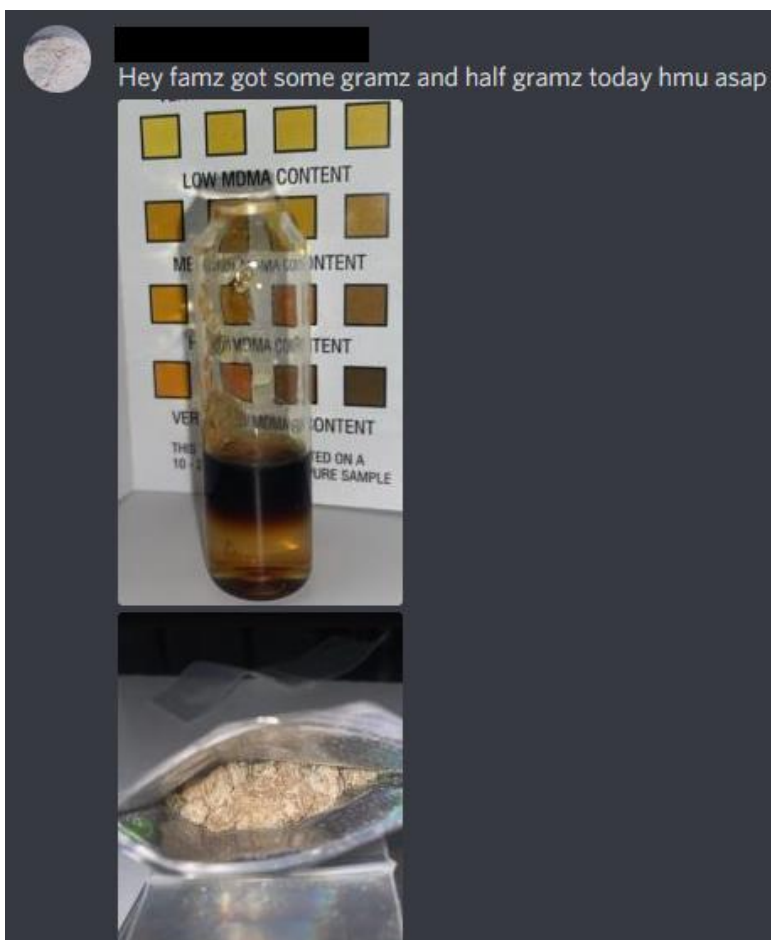
 [Redacted] @Announcements Okay so ive added support tickets to the server, Im leaving complaints there because its useful but for quick support ive added them, its pretty straight forward, just react to the bot in the support text chat and it creates a chat for u to talk to admins privately

25 January 2021

 [Redacted] im just testing the waters and see what the staff and people prefer

2. Seller adverts

Category data collected from selling channels for different drug types and selected to ensure a range of advert styles ranging from interactive (e.g., using emojis, etc), to basic (e.g., little description or no photo).





Still in!! Pick up Wellington central

**Vitamin K for
ya Saturday 🤔**



ISOMER KET
Grams - \$250
Halfs - \$140





PICK UP!


\$60 DOLY (0.1g)
\$120 QUARTERS (0.25g)
\$200 HALFS (0.5g)
PRO \$350 GRAMS (1g)




**CRYSTAL
ROCKY
SHARDS**

 [REDACTED] REPRESSED 2mg Alprazolam Xanax bars. Insanely accurate dosage and really well pressed. No analogues or added bullshit, just the good stuff!
\$25ea
Deal on bulk if ya lucky too.
Get at me!

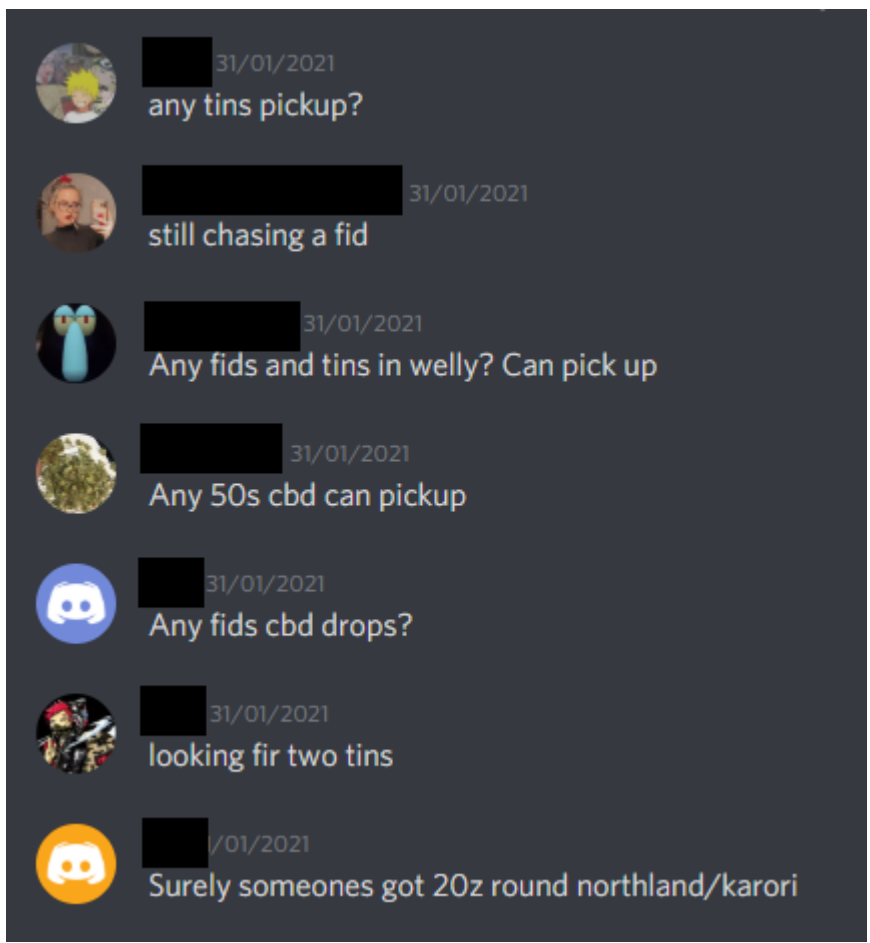
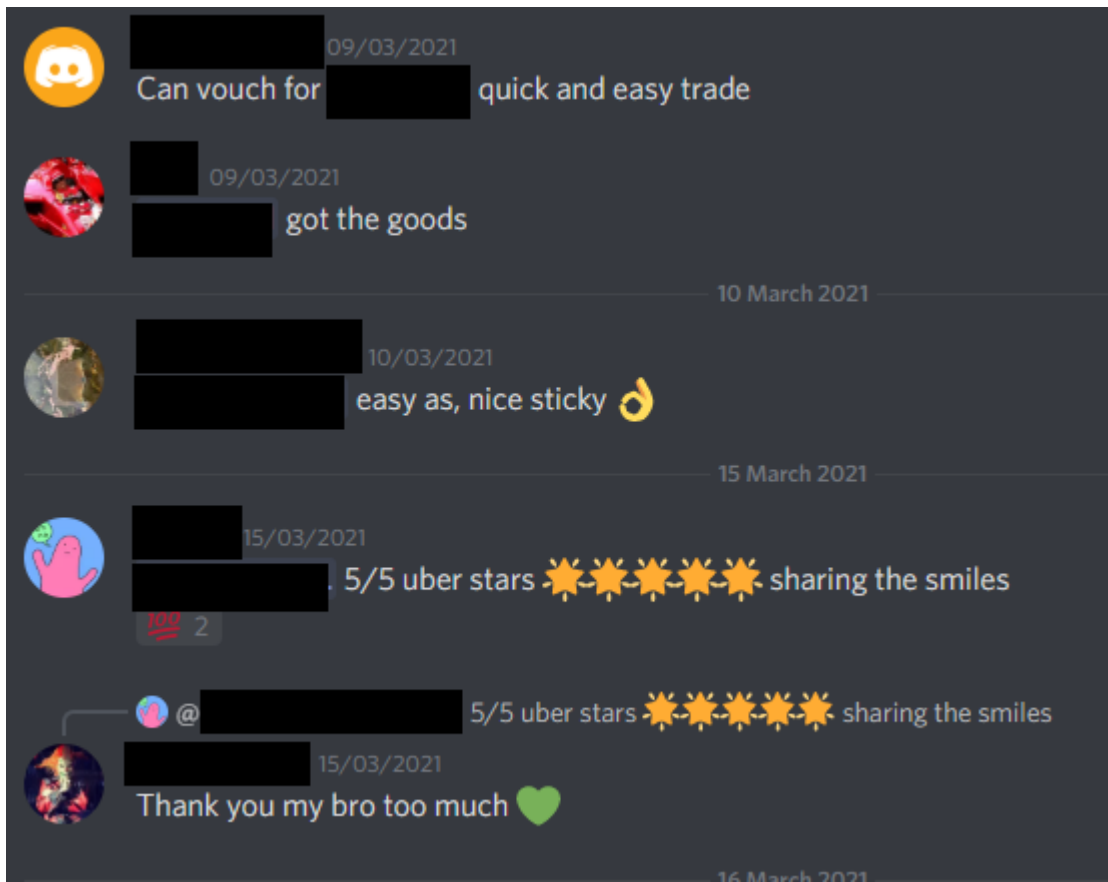


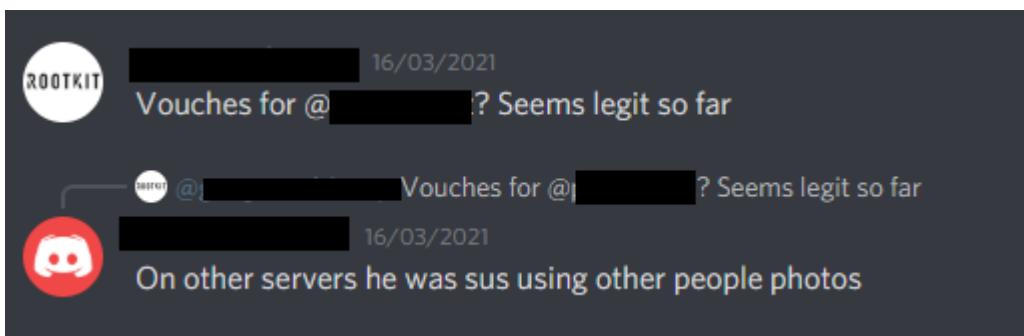
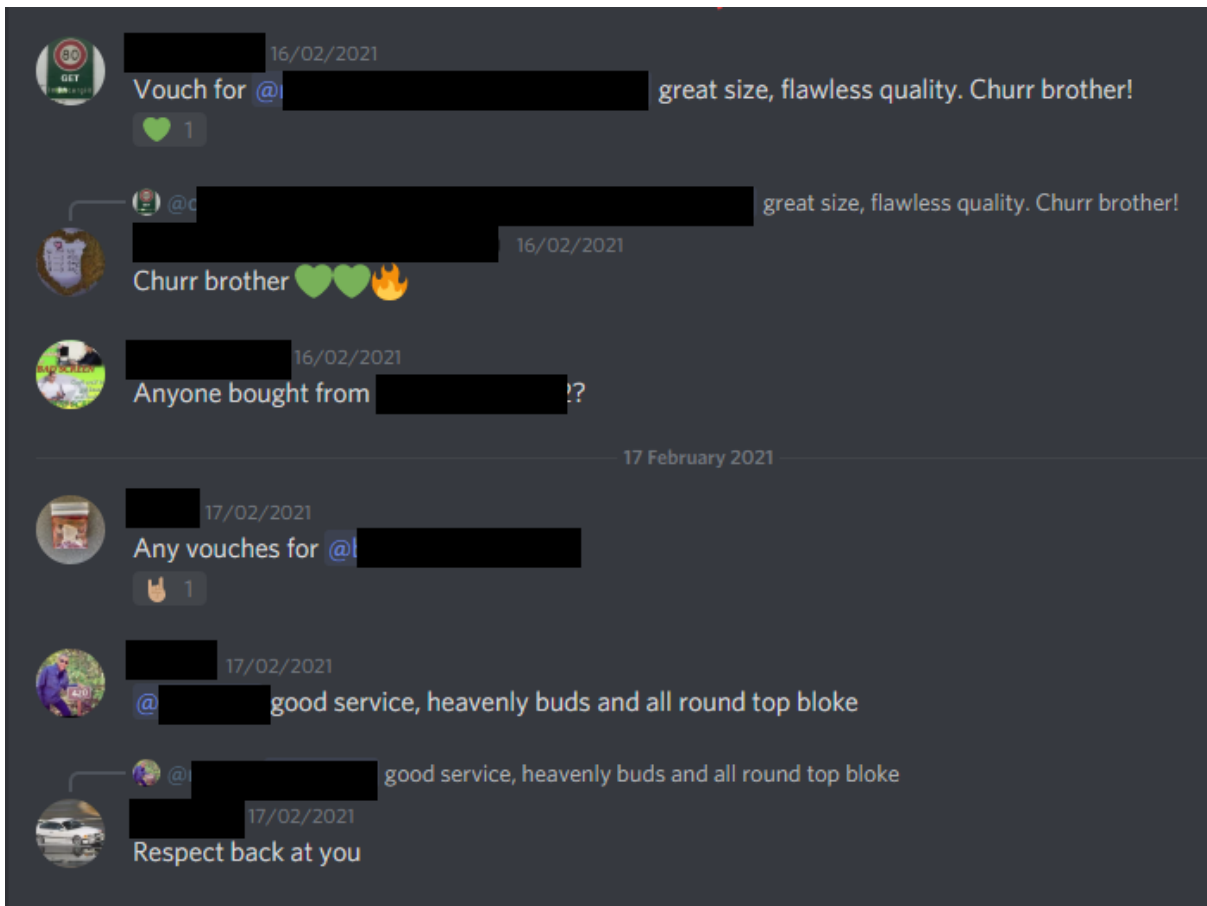
 [REDACTED] Yesterday at 13:41
200ug California sunshine ☀️ tabs
Singles, strips and a few half sheets
Are available
Dm for pick up location
Can maybe drop for gas \$ if worth it
Vouches and photos of previous sales are available on request

 [REDACTED] Yesterday at 14:42
Gamma Goblin goblins gift tabs limited release (hits like 250 ug) advertised as 105 ug 99.9% needle point (as opposed to 95% Purity). \$30 ea, deals for multi, drop offs negotiable. 😊

3. Seller reviews and buyer requests

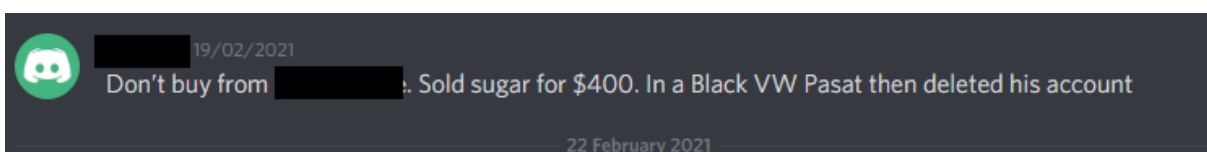
Data collected from server channels for posting 'vouches' or requesting information on other members, and 'buyer requests' channels.

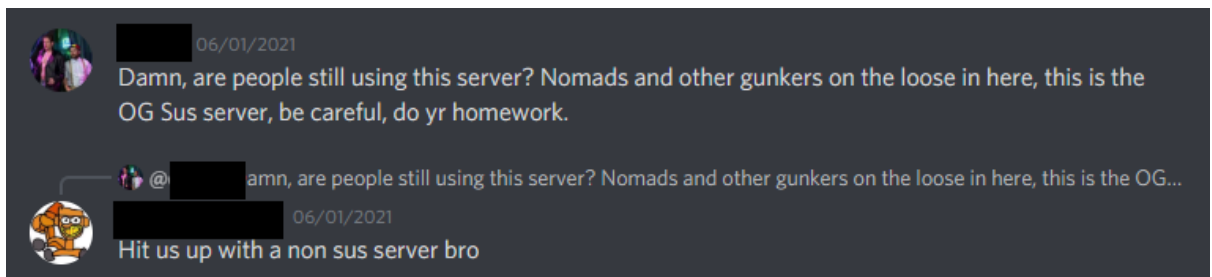
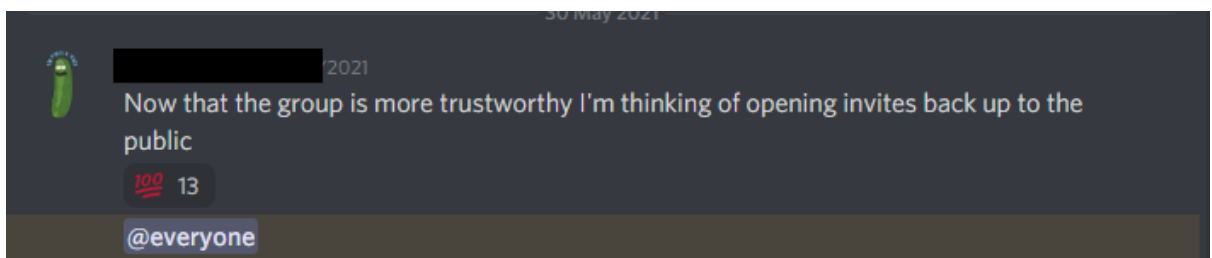
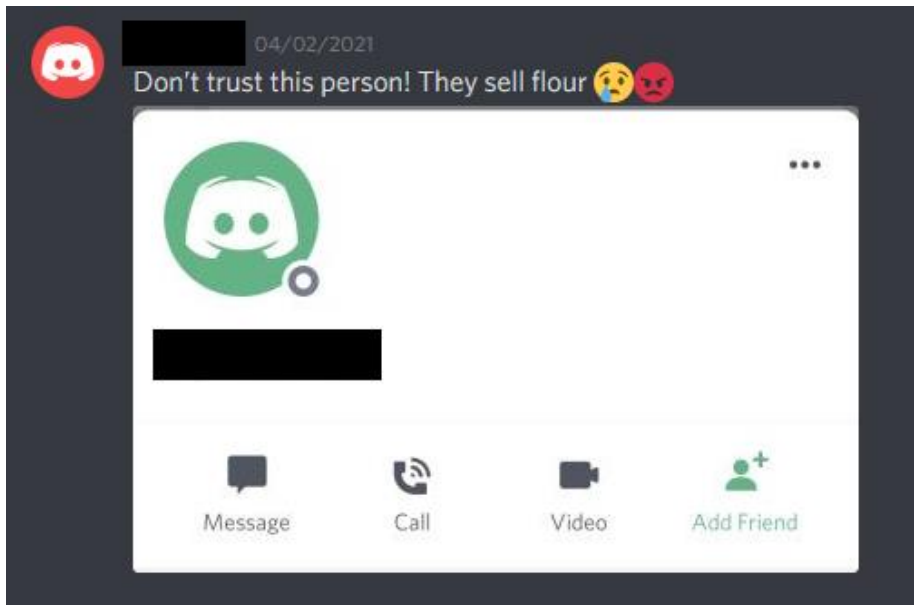
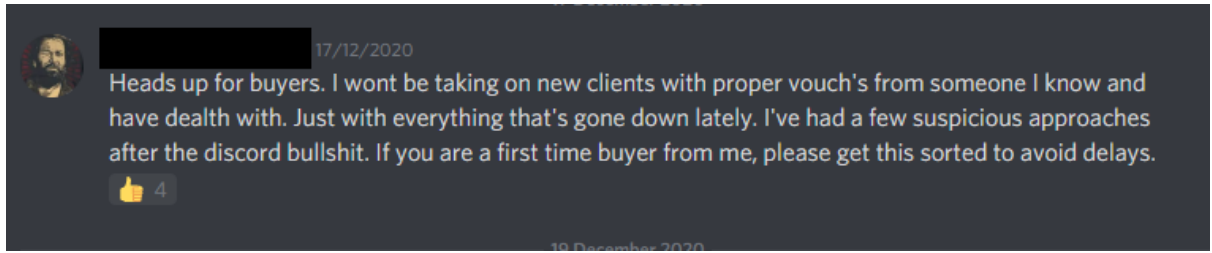




4. Scamming allegations and drama

Data collected from server scam warning channels. Some overlap with the server layout category as administrator announcements often related to measures like closing invite links to prevent scammers or gang members from infiltrating servers and member posts sometimes accuse the entire drug server of being unreliable.







[Redacted] 02/02/2021

Is @ [Redacted] sus?



[Redacted] 02/02/2021

Yes

[Redacted]

[Redacted]

[Redacted]

All the same



[Redacted] 02/02/2021

Tf don't know who to trust on these servers thanks for the heads up



[Redacted] 02/02/2021

Imao you'd think he'd stop making accounts with the word [Redacted] in the name



[Redacted] 02/02/2021

@ [Redacted] banned him



Appendix K: Project ‘main codes’ framework adapted from NVivo

key:

- **Bold:** Primary code
- *Italics:* Secondary code
- Plain: Tertiary code

Name	Description
App 'choice'	Considers how buyers and sellers navigate social media for drug trading given the range of similar platforms they <i>could</i> use. Maps distinctions participants make between platforms based on the paradigms of security and convenience and how this is related to different drug market contexts. Includes the use of multiple platforms for drug trading.
<i>App convenience</i>	References to using “taken for granted” social media platforms and messaging apps for drug trading. Participant reflections on the importance of familiarity with an app and perceptions of the number of people around them who use it. Also includes. Includes instances where using Messenger was referred to interchangeably with other communication mediums (e.g., text and in-person conversation). Also contains references to the encrypted messaging apps as <i>inconvenient</i> or not ‘user friendly’ because they are unfamiliar and/or not enough people use them.
<i>App security</i>	Comparisons or justifications for using different platforms for drugs based on the presence or lack of perceived security features (end-to-end encryption, username-based sign up and self-deleting messages or message timers). Also contains references to <i>low security</i> apps like Messenger. For Discord, this code houses references to “higher tier” drug servers and examples of server management that improve a server’s overall security (e.g., tightly regulating invite links).
<i>App to app</i>	Instances in which participants report using a range of different platforms/apps to buy or sell drugs and justifications for doing so. Largely oriented towards <i>who</i> is <i>where</i> (links to “your dealer’s dealer” code), where different apps are used in relation to different seller types.
<i>App to online other</i>	Intersections between the use of social media to buy or sell and other forms of digital drug supply (surface web or darknet). Participants may move from the darknet/surface web onto social media, or vice versa (though little material on this). Coded material

Name	Description
	may be indirect (e.g., participants <i>know of</i> drugs being bought on the darknet and sold on social media).
<i>Group to group</i>	Relates specifically to participants making use of Discord drug servers or Facebook/Messenger selling groups where practices of jumping from group to group were commonplace. In these cases, rather than move between platforms, participants often moved between groups on the <i>same</i> platform. Overlaps with “markets of strangers” code.
<i>Seller discretion</i>	Considers how sellers navigate ‘choice’ of social media platform or messaging app in relation to their needs or security OR in relation to the needs of their buyers. Ranges from explicit selection of <i>one</i> specific app (mostly an encrypted app) through to spread across different ‘acceptable’ platforms. Contains seller references to how they do or don’t balance needs for security with buyer needs for convenience in ‘choosing’ an app.
Buyer discretion	A complimentary code to ‘seller discretion’. Considers the influence of buyer preferences on the ‘choice’ of platform/app for drug trading. Contains references to buyer preferences for a more convenient app (‘app convenience’), and instances where they do or don’t respect seller’s ‘choice’ of platform.
Drug accessibility	References to participant perceptions of drug accessibility on social media. Material largely indicates perceptions of <i>increased</i> drug accessibility (links to ‘easy connections’ and ‘transaction logistics’ codes). Increased drug accessibility often referred to in combination with <i>streamlining</i> and <i>convenience</i> of social media drug purchasing and selling (e.g., using platform features to advertise stock or leverage drug access more efficiently).
<i>Drug type, quality and price</i>	Participant reflections on drug types they bought or sold via social media, or what was available (e.g., drug types they <i>could</i> buy on Discord drug servers generally). Includes perceptions of drug quality, quantity, and price, and the frequency with which drugs are bought/sold.
<i>Drug use</i>	General participant reflections on their drug use. Also contains material around whether participants feel social media drug purchasing has impacted on their drug use patterns (change in frequency, drug types used, different product types used – e.g., edibles instead of cannabis flower).

Name	Description
Drug content, adverts and recommendations	Interaction with drug related content on social media/online generally (e.g., Tripsit, communities on Reddit, Facebook groups for cannabis or psychedelics, following KYSNZ, etc.). Also includes viewing of drug related adverts on Facebook and Instagram (e.g., bongos, edibles, wish app adverts, nangs, grow tents, rehab).
'Easy connections'	CENTRAL CODE: Considers the importance of social networking to social media drug markets (and the 'drug accessibility' code). Material relates to the ease with which buyers and sellers can connect on social media/messaging apps and the expanded network size that can result. Code is divided into <i>two</i> different types of social media-facilitated networking: 1) "markets of strangers" ; and b) "Your dealer's dealer" .
<i>"Markets of strangers"</i>	Participant experiences using social media and messaging apps to connect with buyers or sellers they <i>do not know personally</i> . Reflects an 'open' drug market dynamic. Material pertains largely to Discord drug servers and Facebook selling groups, but also some use of dating apps, and Reddit to find local sellers on encrypted messaging apps. Social media has a more integral <i>connective</i> function by bringing buyer and seller together.
Reliability of market, seller, and product	Perceived trustworthiness of drugs, other market participants <i>and</i> the markets themselves in a "markets of strangers" environment. Includes references to the challenges of ascertaining reliability in these markets (links to codes 'getting rolled' and "a bad batch"). Also incorporates reflections on the consistency of drug access (e.g., product availability, or being able to transact with the same people repeatedly).
Seller types	Indications of the types of sellers operating on this type of social media drug market, and participants relationship to them. Mostly commercial sellers, mostly unknown to the buyer. Also contains reflections on difficulty of knowing how sellers are embedded in local market contexts.
<i>"Your dealer's dealer"</i>	Participant experiences using social media to connect with buyers or sellers they know or know of. This code encompasses 'closed' drug market dynamics, ranging from commercial to social supply. Emphasis placed on the importance of mutual ties in brokering access to sellers or deciding which buyers to sell to. Often involves the use of <i>existing</i> (social) connections that participants have had prior physical interactions with. Social media becomes a <i>logistical</i> tool for messaging predetermined contacts.

Name	Description
Reliability of seller and product	Partner code for similarly named code under “markets of strangers”. References to trustworthiness in a “your dealer’s dealer” setting. Includes references to the potential benefits of increased transparency and accountability in this type of social media drug market (links to codes ‘getting rolled’ and ‘a bad batch’). Primacy of relationship of trust between buyer and seller, and/or importance of friendship.
Seller types	See code of same name under “markets of strangers”. Indications of the type of sellers used by participants using a “your dealer’s dealer” market dynamic. Some commercial (mostly encrypted messaging apps), but mostly defined friends, acquaintances, etc. Also includes references to scale of seller operation to get clearer idea of level of involvement given vagueness of term ‘friend’.
'Everyday' socials	Participant responses to initial section of interview questionnaire on their day-to-day use of social media for purposes like connecting with friends or looking at content, keeping up with news, gaming, etc. Code contains a separation between ‘everyday’ socials: Facebook and Messenger, Snapchat, Instagram, Discord; and the encrypted messaging apps – Wickr, Telegram and Signal. References to use of encrypted apps almost exclusively for drug trading.
Market management	Applies to ‘open’, “markets of strangers” social media drug market dynamic (Facebook/Messenger groups, but MOSTLY Discord drug servers). Deals with the role of the group or server administrator in the function of the market, establishing parameters for market entry or banning misbehaving members. In the Discord context, contains references to unmanaged or badly managed drug servers. The codes below also pertain largely to Discord.
<i>Community</i>	References to the creation of a community within the Discord drug server or selling group (or attempts to build community). Documents systems of ‘vouching’ and reporting scams, or cop-stops. Contains references to the role of the administrator in banning scammers and generally maintaining the viability and quality of the market and community.
<i>Know your servers</i>	Exclusive to Discord environment. Participant distinctions between different types of drug server based on comparison between features, size, accessibility, management, etc. Also documents the function of being discerning in servers joined as a safety management tool (links to ‘reliability of markets, sellers and product’ code).

Name	Description
Safety concerns, risks, and challenges	A broad code housing ‘traditional’ and ‘non-traditional’ drug market risks participants faced as part of social media setting. Material separated according to drug adulteration (“a bad batch”), being ripped off/victimized or robbed (‘getting rolled’), and risk of arrest (‘law enforcement’). The code ‘exposure on social media’ deals with material on navigating the challenges of online privacy, in relation to social media drug trading (e.g., user data collection, separation of drug and non-drug accounts, etc.)
<i>“A bad batch”</i>	Participant referenced to concern around the purity or adulteration of drugs purchased via social media. Higher risk perceptions in “markets of strangers”, and lower risk perceptions in “Your dealer’s dealer” settings. Also contains references to the use of drug testing or any additional measures taken to prevent ingesting adulterated drugs.
<i>Exposure on social media</i>	Links to ‘law enforcement’. Focuses on how online risks of the social media environment (e.g., data persistence, context collapse) are navigated as part of drug trading behaviours. Indicates overlap between risk of exposure to employers, parents, etc. and law enforcement. Broken down into three child codes: a) ‘accounts and usernames’; b) ‘social media data collection and platform trust’; and c) ‘visibility, self-presentation, and drugs’.
Accounts and usernames	Material related to the use of ‘fake’ or anonymous accounts for drug trading, and/or whether participants used their personal social media accounts to buy and sell drugs and any issues encountered as a result. Links to ‘app security’ code in emphasizing value of username-based sign up on platforms like Wickr.
Social media data collection and platform trust	Participants responses to questions about social media data collection and whether this was a concern vis a vis social media drug trading. Also contains reflections on platform-level trust (e.g., “I don’t trust Facebook”), and broader considerations (e.g., beyond security features) of whether certain platforms are good candidates for drug trading, and why (e.g., “doesn’t cooperate with government legal requests”).
Visibility, self-presentation, and drugs	Links to ‘accounts and usernames’, but deals with overlap between personal and drug accounts, and how participants seek to manage this by ‘cleaning up’ or mediating their self-presentation (e.g., ‘scrubbing Facebook profile’) and factoring in considerations of how drug-related content is visible to others (e.g., ‘I don’t follow them because then others can see that’).

Name	Description
<i>Getting “rolled”</i>	Risk perceptions and experiences around risk of victimization from buyers and sellers on social media. Material pertains largely to perceptions of greater risk involved in a “markets of strangers” setting (e.g., Discord). The term “rolled” was used by Discord buyers and sellers to describe being ripped off or robbed.
Managing risk of rip off and violence	Considers how participants try to avoid victimization as part of engaging with social media drug markets. Includes references to using a “your dealer’s dealer” market primarily for risk management purposes (e.g., ‘safer, more accountability’), and discussion of informal control mechanisms like checking ‘vouches’ and ‘verification’ on a Discord server.
<i>Law enforcement</i>	Deals with participant risk perceptions and experiences around exposure to law enforcement in social media drug trading. Most material indicates ‘low risk’ perceptions of police owing to small-scale involvement in drug trading (e.g., ‘small fish’). Also documents how transaction risks like market role, amount of drug bought/sold, or drug type can influence risk perceptions around police.
Managing law enforcement risk	Breaks down how participants tried to avoid being exposed to law enforcement as part of social media drug trades. Includes use of secure messaging apps for high-risk trades, anonymous accounts, use of code language on Messenger, keeping adverts ‘vague’, monitoring ‘cop stops’ channels on Discord, etc. Overlaps with the codes ‘app security’ and ‘exposure on social media’.
Transaction logistics	The core components of a social media drug trade. Code contains concrete transaction examples given by participants, and outlines the main role played by the platform (e.g., logistical or connective). Child codes are used to structure other core aspects of a social media trade: a) ‘Access to markets and sellers’; b) ‘advertising’; and c) ‘the trade’.
<i>Access to markets and sellers</i>	Deals with material specific to how participants generated access to buyers/sellers/markets on social media. Most material is indicative of the use of existing social connections to either get seller contacts or join drug servers for example.
<i>Advertising</i>	Relates to the role of advertising in participant experiences of social media drug markets, either as buyers or sellers. May also include buyer references to posting ‘requests’ in selling groups or drug servers to advertise they wanted to buy.

Name	Description
<i>The trade</i>	Descriptions of how a social media drug transaction was completed (e.g., pick up, delivery, meet at a friend's house to 'chill', via post).
Use of other markets	Participant references to 'other types' of drug markets they used to buy or sell drugs. This could be either in combination with, prior to, simultaneously or after using social media for drug trading. Not all 'other types' of drug markets are per se clearly differentiated from social media drug trading (e.g., 'social supply' and 'text or call (mobile markets)'). However, if participants described them as separate, they are coded here.
<i>Darknet (online general)</i>	Deals largely with participant experiences using the darknet, but also some use of surface webshops for NPS or RCs. Darknet use for drug purchasing was often temporary, or in the past before switching to social media. But some participants used both at the same time for resale/social dealing purposes.
<i>Other market types</i>	A small group of material around participant engagement with drug markets involving places of work or education, and the use of 'tinny houses'.
<i>Social supply</i>	Considerable overlap with the "your dealer's dealer" code group. Contains references to the use of social supply or 'word-of-mouth' as distinct from participants use of social media drug markets. References to this type of 'other' drug market may include the use of apps like Messenger to contact friends but emphasis is placed on the social connection aspect, rather than the app use.
<i>Text or call (mobile markets)</i>	A small code around participant use of text or call markets, either in combination with social media (e.g., 'Most dealers are on Snapchat, but some dealers just text you'), or prior to moving to social media.

Appendix L: Chapter 7 supplementary data on social media and messaging app engagement among interviewees

Participant number	Market role (e.g., buyer, seller)	Number of apps used for drugs	Apps used for buying and/or selling drugs	Apps used for 'everyday' purposes (e.g., connecting with friends, family, scrolling/sharing content, gaming, news, dating, etc.)
P1	Buyer	3	Messenger, Wickr, Discord	Facebook, Messenger, Instagram, WhatsApp, Reddit, Tumblr
P2	Buyer	3	Wickr, Kik, Telegram	Facebook, Messenger, Snapchat, Instagram, Discord
P3	Buyer, seller	3	Messenger, Snapchat, Wickr	Facebook, Messenger, Snapchat, Instagram, Discord
P4	Buyer	2	Snapchat, Wickr	Facebook, Messenger, Snapchat, Discord
P5	Buyer	1	Facebook, Messenger	Facebook, Messenger, Instagram, Reddit, Discord
P6	Buyer	1	Discord	Facebook, Messenger, Snapchat, Instagram, TikTok, Discord
P7	Buyer	1	Discord	Facebook, Messenger, Instagram, WhatsApp, Reddit, Discord
P8	Buyer, seller	3	Messenger, Snapchat, Wickr	Facebook, Messenger, Snapchat, Instagram, WhatsApp, Discord
P9	Buyer, seller	5	Messenger (secret chats), Snapchat, Wickr, Signal, Telegram	Facebook, Messenger, Snapchat, Discord, Telegram, Reddit
P10	Buyer, seller*	3	Messenger, Discord, Wickr	Facebook, Messenger, Instagram, Reddit
P11	Buyer	1	Messenger, Instagram Messenger	Facebook, Messenger, Instagram, Reddit
P12	Buyer, seller	3	Facebook, Messenger, Wickr, Tumblr	Facebook, Messenger, Snapchat, Discord, Tumblr
P13	Buyer	5	Messenger, Telegram, Discord, Tinder, Grindr	Facebook, Messenger, Instagram, WhatsApp, Discord, Telegram, Reddit, Tumblr, Twitter
P14	Buyer	1	Discord	Facebook, Messenger, Snapchat, Instagram, Reddit
P15	Buyer, seller	2	Discord, Signal	Facebook, Messenger, Instagram, Discord
P16	Buyer	1	Messenger	Facebook, Messenger, Instagram, WhatsApp
P17	Buyer	3	Messenger, Snapchat, Instagram Messenger, Wickr	Facebook, Messenger, Snapchat, Instagram

P18	Buyer, seller*	4	Messenger, Snapchat, Instagram Messenger, Wickr	Messenger, Snapchat, Instagram, Discord
P19	Buyer	2	Wickr, Signal	Facebook, Messenger, Instagram, Reddit, Twitter
P20	Buyer, seller*	4	Messenger (secret chats), Snapchat, Wickr, Signal	Facebook, Messenger, Snapchat, Instagram, Discord, Reddit, Twitter
P21	Buyer	1	Snapchat	Facebook, Messenger, Snapchat, Instagram, WhatsApp, Discord.
P22	Buyer	1	Snapchat	Snapchat, Instagram
P23	Buyer, seller*	3	Messenger, Snapchat, Discord	Facebook, Messenger, Snapchat, Instagram, Discord, Telegram
P24	Buyer, seller	3	Snapchat, Instagram Messenger, Wickr, Telegram	Facebook, Messenger, Snapchat, Instagram
P25	Buyer	2	Discord, Wickr	Facebook, Messenger, Instagram, Reddit
P26	Buyer	1	Messenger, Snapchat	Facebook, Messenger, Snapchat, Instagram
P27	Buyer, seller	3	Facebook, Messenger, Snapchat, Wickr	Facebook, Messenger, Snapchat, Discord, Reddit
P28	Buyer	2	Snapchat, Wickr	Messenger, Snapchat, WhatsApp, Discord, Reddit
P29	Buyer, seller	2	Snapchat, Discord	Snapchat, Instagram
P30	Buyer	2	Snapchat, Signal	Snapchat, Instagram, Signal
P31	Buyer, seller*	3	Snapchat, WhatsApp, Discord	Facebook, Messenger, Snapchat, Instagram, WhatsApp, Tinder, Grindr
P32	Buyer, seller*	2	Messenger, Instagram Messenger	Facebook, Messenger, Snapchat, Instagram, Telegram, Signal, Tinder
P33	Buyer	1	Discord	Snapchat, Instagram, Discord

* = social supply or social dealing

Note: Participants were asked about their day-to-day social media use in broad terms. The interviewer made a point of asking after the most popular, mainstream platforms if omitted (e.g., Facebook, Messenger, Snapchat, Instagram and Discord), but did not ask after the use of more specific platforms like Twitter or TikTok. Rather, it was left up to participants to include these platforms if they wanted to. As a result, some platforms may be underrepresented or omitted from the ‘everyday’ social media column as participants may not have defined them as ‘social media’ (e.g., there was some confusion around whether Reddit was a ‘social media’ platform among some participants). Alternatively, our focus on participants day-to-day use of social media may have meant participants did not mention those platforms they used more sporadically (e.g., Tinder/Grindr).

