



**Burnet Institute**

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# The impacts of COVID-19 restrictions on drug markets and drug use among a cohort of people who use methamphetamine in Victoria, Australia.

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# Acknowledgments

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- the National Health and Medical Research Council for funding VMAX study
- co-investigators, co-authors of this project
- the participants for generously contributing their time to this study
- the staff of the community-based organisations who assisted in recruitment
- the contribution to this work of the Victorian Operational Infrastructure Support Program
- the support and assistance given by the members of the VMAX study team with participant recruitment, follow-ups, and interviewing

## Disclosure of interests

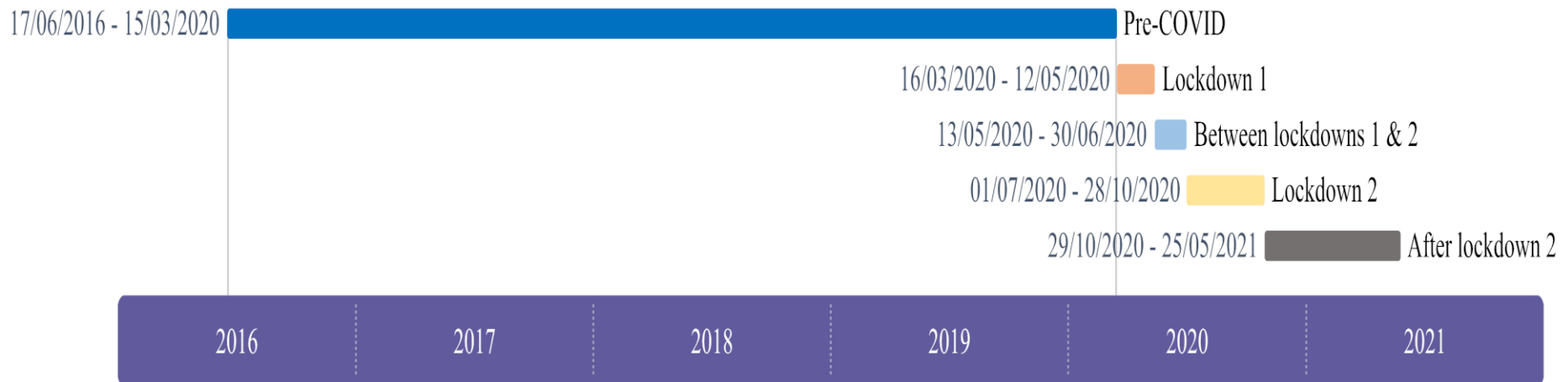
- PD, MS, and LM are funded by National Health and Medical Research Council (NHMRC) Senior Research Fellowship
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- Burnet institute receives infrastructure support from Victorian Government, Australia.

## Key Points

- This is based on longitudinal data from VMAX study from June 2016 to May 2021
- VMAX is a prospective cohort study of people who use methamphetamine recruited from ***metropolitan Melbourne and regional Victoria***, established in 2016
- VMAX data have been collected via face-to-face and telephone interviews with 853 participants recruited before the pandemic began
- Participants are followed up annually with a modified version of the original baseline questionnaire and a shortened version in the intervening six months.

# Important information

- Based on the date of the interview, following key phases of the pandemic were defined
  - **Pre-COVID** : From 17/06/16 to 15/03/2020
  - **During lockdown 1** : From 16/03/2020 to 12/05/2020 (58 days)
  - **Between lockdowns 1 & 2** : From 13/05/2020 to 30/06/2020 (49 days)
  - **During lockdown 2\*** : From 01/07/2020 to 28/10/2020 (120 days)
  - **After lockdown 2** : From 29/10/2020 to 25/05/2021 (209 days)



## Important information

- Based on the date of the interview, following key phases of the pandemic were defined
  - **Pre-COVID** : From 17/06/16 to 15/03/2020
  - **During lockdown 1** : From 16/03/2020 to 12/05/2020 (58 days)
  - **Between lockdowns 1 & 2** : From 13/05/2020 to 30/06/2020 (49 days)
  - **During lockdown 2\*** : From 01/07/2020 to 28/10/2020 (120 days)
  - **After lockdown 2** : From 29/10/2020 to 25/05/2021 (209 days)

\* : There were significant differences between the restrictions in metropolitan Melbourne and regional Victoria **during lockdown 2**. Restrictions in metropolitan Melbourne were much stringent (**curfew from 8pm to 5am, 5km limit on movements, 1-hour limit on exercise**) compared to the restrictions in regional Victoria during that time.

# Aims

- Aims to explore the effects of the key phases of the Victorian pandemic response mainly on
  - **methamphetamine price and**
  - **methamphetamine use frequency**and how these varied according to a range of exposures, in particular the recruitment location (metropolitan Melbourne or regional Victorian residence)
- We also examined changes in reports of the **use frequency of other drugs (alcohol, tobacco and other illicit drugs)** related to the pandemic restrictions

# Sample selection

VMAX data from June 2016 to May 2021 (3,244 interviews/853 participants)

451 participants were excluded due to

- Not having follow-up interviews
- Not having interview records during the pandemic

## Intermediate sample for the study

Participants who have interviewed at least once during the pandemic  
(402 participants)

### Final sample for the study on “methamphetamine price paid per gram”

(836 interviews/185 participants)

Consisting of those who have

- Purchased methamphetamine during the pandemic

**and**

- Used methamphetamine in the last month

### Final sample for the study on “methamphetamine, alcohol, tobacco and other illicit drugs use frequency” (1,488

interviews/277 participants)

Consisting of those who have

- Used methamphetamine during the pandemic

**and**

- Not used methamphetamine during the pandemic, but used year prior to the pandemic



# Outcome measures and exposures

## *Primary outcomes*

- **Methamphetamine price (normalised as price paid per gram in AUD)**
- **Use frequency of methamphetamine** (Methamphetamine use frequency was determined based on the question "*Average number of days per week methamphetamine (any form) used in last month?*")

## *Secondary outcomes*

- **Use frequency of alcohol, tobacco and other illicit drugs**
- Determined as "an average number of days per week used in last month"

# Exposures - Fixed effects

Main exposures	Time-independent covariates	Time-dependent covariates
<i>COVID-19 restriction period</i>	<i>Age at baseline</i>	<i>Employment status</i>
<i>Recruitment location</i>	<i>Sex</i>	<i>Accommodation stability</i>
		<i>Income level per week</i>
		<i>Drug source status</i>
		<i>Drug treatment status</i>
		<i>Time in the study</i>

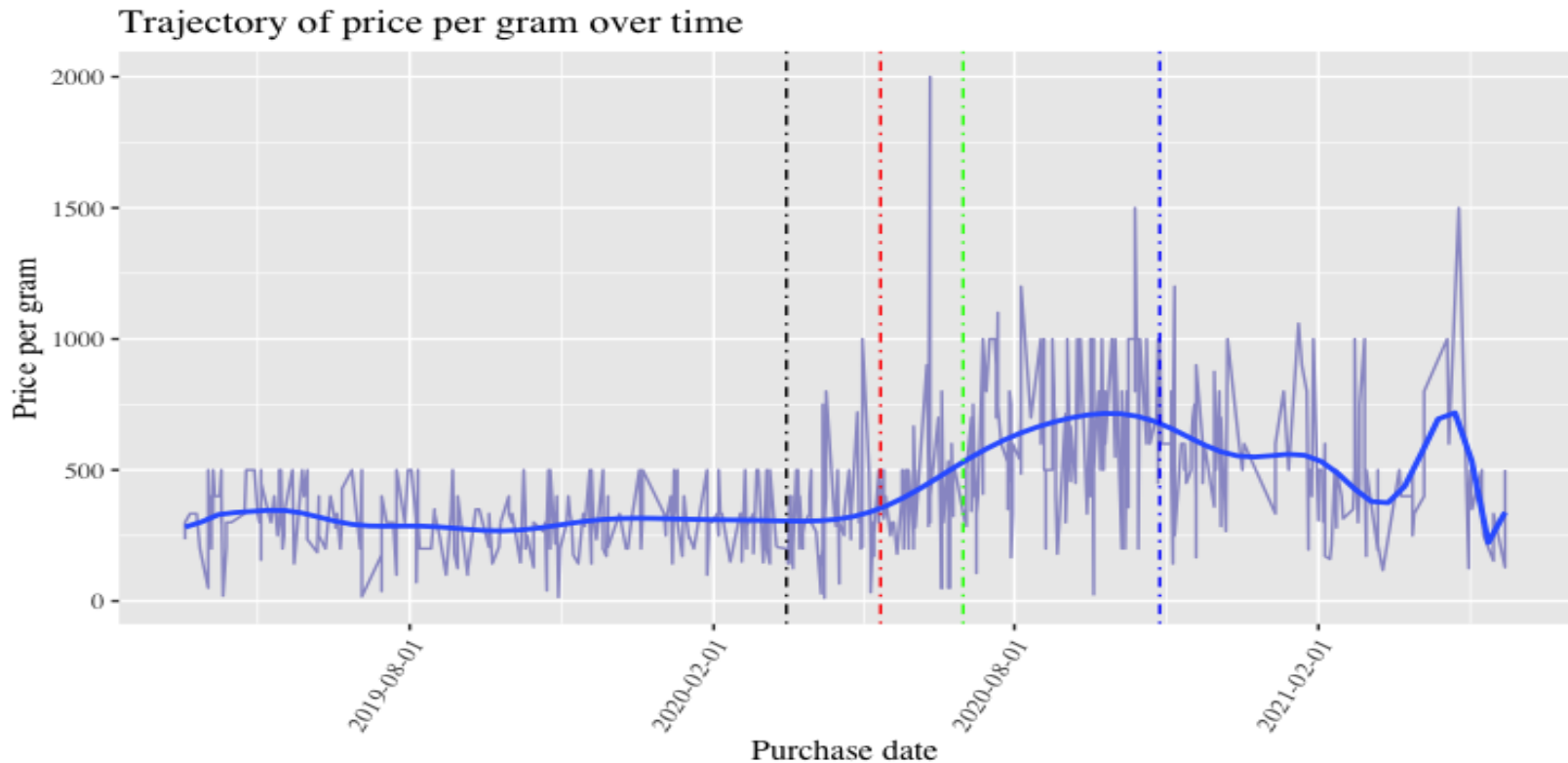
# Statistical Analysis

- *Generalised linear mixed effects models (GLMM)* were used for modelling
- Depending on the distribution of the response variable, a suitable distribution was used for each outcome measure

Outcome measure	Distribution
<b>Methamphetamine price</b>	<b><i>Gaussian</i></b>
<b>Methamphetamine use frequency</b>	<b><i>Poisson</i></b>
Alcohol use frequency	<i>Zero-inflated Poisson</i>
Tobacco use frequency	<i>Poisson</i>
Other illicit drug use frequency	<i>Zero-inflated negative binomial</i>

- An interaction term **between recruitment location and restriction period** was also estimated to assess the two primary outcomes as well as to assess the use frequency of other illicit drugs

# Results - price paid per gram of Methamphetamine



NOTE: BLACK dotted line represents the start of first lockdown, RED represents the end of first lockdown, GREEN and BLUE represent the start and end dates of second lockdown respectively.

	All	Pre-COVID	During lockdown 1	B/w lockdowns 1 & 2	During lockdown 2	After lockdown 2
<b>Number of interviews (%)</b>	836	533 (63.76)	49 (5.86)	46 (5.50)	115 (13.76)	93 (11.12)
<b>Methamphetamine Price per gram: mean (SD)</b>	409 (226)	338 (148)	322 (193)	445 (290)	681 (267)	506 (231)

# Results - price paid per gram of Methamphetamine

	Price paid per gram		
Covariates	Estimate (SE)	CI	p
<b>Melbourne recruitment</b>	-29.14 (19.16)	-66.75 – 8.47	0.129
<b>COVID-19 restriction period (Ref: Pre-COVID)</b>			<b>&lt;0.0001</b>
<b>During lockdown 1</b>	7.74 (67.58)	-124.91 – 140.40	0.91
<b>Between lockdowns 1 &amp; 2</b>	158.20 (45.87)	68.15 – 248.25	<b>0.01</b>
<b>During lockdown 2</b>	456.51 (27.41)	402.71 – 510.32	<b>&lt;0.0001</b>
<b>After lockdown 2</b>	263.68 (30.81)	203.21 – 324.15	<b>&lt;0.0001</b>
<b>Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)</b>			0.06
<b>During lockdown 1: Melbourne</b>	-3.00 (89.18)	-178.06 – 172.05	0.97
<b>Between lockdowns 1 &amp; 2: Melbourne</b>	-2.22 (55.73)	-111.61 – 107.17	0.97
<b>During lockdown 2: Melbourne</b>	-104.88 (35.40)	-174.37 – -35.39	<b>0.01</b>
<b>After lockdown 2: Melbourne</b>	-30.84 (39.58)	-108.53 – 46.84	0.44

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During lockdown 1	7.74 (67.58)	-124.91 – 140.40	0.91
Between lockdowns 1 & 2	158.20 (45.87)	68.15 – 248.25	<b>0.01</b>
During lockdown 2	456.51 (27.41)	402.71 – 510.32	<b>&lt;0.0001</b>
After lockdown 2	263.68 (30.81)	203.21 – 324.15	<b>&lt;0.0001</b>
<b>Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)</b>	<div style="border: 2px solid black; padding: 5px;"> <p>Compared to pre-COVID period, <i>during lockdown 2</i> methamphetamine prices increased by AUD456.51 (95%CI:402.71–510.32, p&lt;0.0001) in regional Victoria</p> </div>		
During lockdown 1: Melbourne	-3.00 (89.18)	-178.06 – 172.05	0.97
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After lockdown 2	263.68 (30.81)	203.21 – 324.15	<b>&lt;0.0001</b>
<b>Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)</b>	<div style="border: 2px solid black; padding: 5px;"> <p>Compared to pre-COVID period, <i>during lockdown 2</i> methamphetamine prices increased by AUD351.63 (95%CI:296.71-406.56, p&lt;0.001) in metropolitan Melbourne</p> </div>		0.06
During lockdown 1: Melbourne	-3.00 (89.18)	-178.06 – 172.05	0.97
Between lockdowns 1 & 2: Melbourne	-2.22 (55.73)	-111.61 – 107.17	0.97
During lockdown 2: Melbourne	-104.88 (35.40)	-174.37 – -35.39	<b>0.01</b>
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COVID-19 restriction period (Ref: Pre-COVID)			<b>&lt;0.0001</b>
During lockdown 1	7.74 (67.58)	-124.91 – 140.40	0.91
Between lockdowns 1 & 2	158.20 (45.87)	68.15 – 248.25	<b>0.01</b>
During lockdown 2	456.51 (27.41)	402.71 – 510.32	<b>&lt;0.0001</b>
After lockdown 2	263.68 (30.81)	203.21 – 324.15	<b>&lt;0.0001</b>
Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)	<div style="border: 1px solid black; padding: 5px;"> <p>Prices in regional Victoria <i>after lockdown 2</i> were still significantly higher than pre-COVID measures by AUD263.68 (95%CI:203.31-324.15, p&lt;0.001)</p> </div>		
During lockdown 1: Melbourne	-3.00 (89.18)	-178.06 – 172.05	0.97
Between lockdowns 1 & 2: Melbourne	-2.22 (55.73)	-111.61 – 107.17	0.97
During lockdown 2: Melbourne	-104.88 (35.40)	-174.37 – -35.39	<b>0.01</b>
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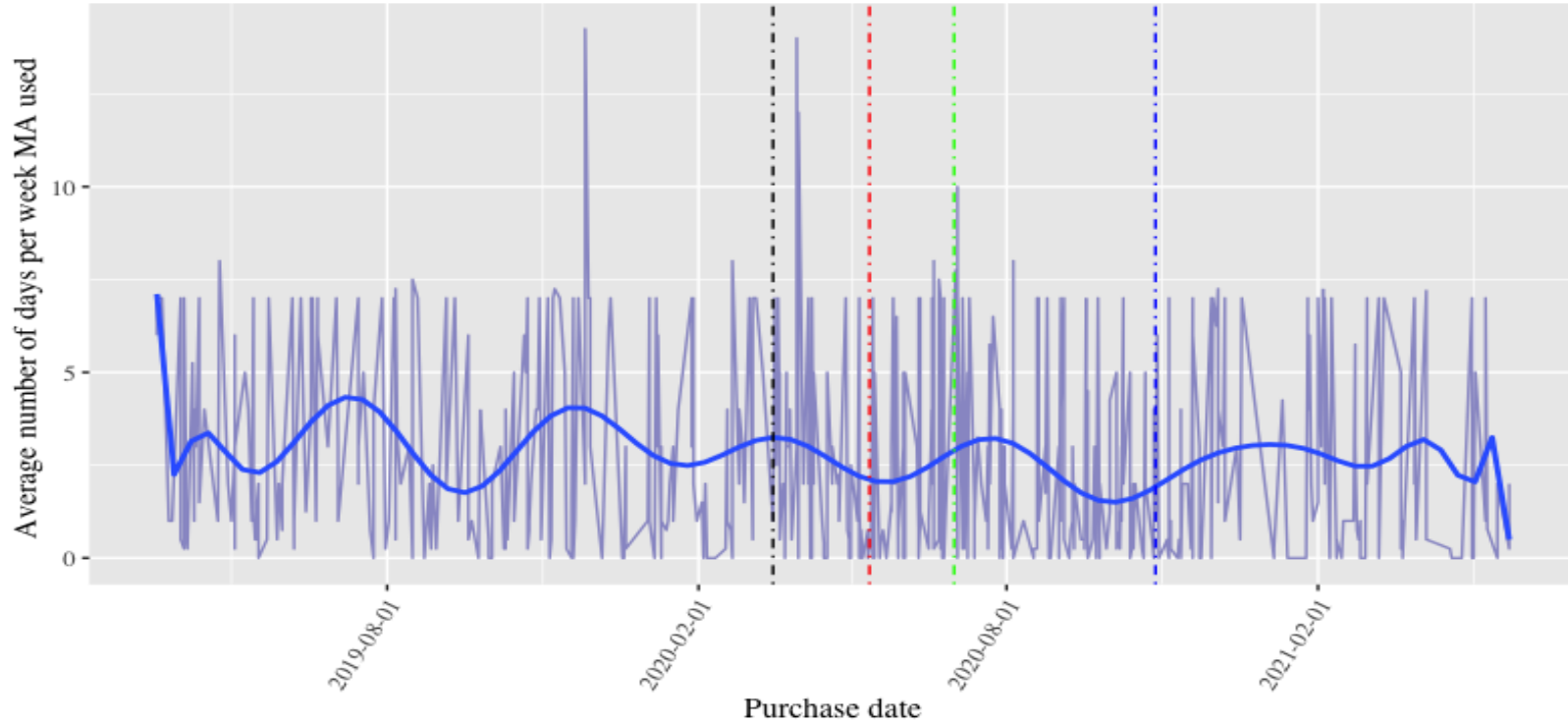


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During lockdown 2	456.51 (27.41)	402.71 – 510.32	<b>&lt;0.0001</b>
After lockdown 2	263.68 (30.81)	203.21 – 324.15	<b>&lt;0.0001</b>
Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)	<p><b>Prices in metropolitan Melbourne after lockdown 2 were still significantly higher than pre-COVID measures by AUD232.84 (95%CI:169.76-295.92, p&lt;0.001)</b></p>		0.06
During lockdown 1: Melbourne	-3.00 (89.18)	-178.06 – 172.05	0.97
Between lockdowns 1 & 2: Melbourne	-2.22 (55.73)	-111.61 – 107.17	0.97
During lockdown 2: Melbourne	-104.88 (35.40)	-174.37 – -35.39	<b>0.01</b>
After lockdown 2: Melbourne	-30.84 (39.58)	-108.53 – 46.84	0.44

# Results – Methamphetamine use frequency

Trajectory of methamphetamine use frequency



NOTE: BLACK dotted line represents the start of first lockdown, RED represents the end of first lockdown, GREEN and BLUE represent the start and end dates of second lockdown respectively.

	All	Pre-COVID	During lockdown 1	B/w lockdowns 1 & 2	During lockdown 2	After lockdown 2
<b>Number of interviews (%)</b>	1,488	1,004 (67.47)	82 (5.51)	62 (4.17)	165 (11.09)	175 (11.76)
<b>Methamphetamine use frequency: mean (SD)</b>	2.58 (2.77)	2.84 (2.82)	2.06 (2.84)	2.41 (2.62)	2.06 (2.49)	1.87 (2.55)

# Results – Methamphetamine use frequency

	Methamphetamine use frequency		
Covariates	Relative risk (SE)	CI	p
<b>Melbourne recruitment</b>	0.76 (0.06)	0.65 – 0.88	<b>&lt;0.001</b>
<b>COVID-19 restriction period (Ref: Pre-COVID)</b>			<b>0.01</b>
<b>During lockdown 1</b>	0.46 (0.13)	0.27 – 0.79	<b>0.01</b>
<b>Between lockdowns 1 &amp; 2</b>	0.91 (0.18)	0.61 – 1.34	0.63
<b>During lockdown 2</b>	0.76 (0.08)	0.62 – 0.92	<b>0.01</b>
<b>After lockdown 2</b>	0.70 (0.08)	0.56 – 0.86	<b>0.01</b>
<b>Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)</b>			<b>0.05</b>
<b>During lockdown 1: Melbourne</b>	1.51 (0.52)	0.77 – 2.98	0.23
<b>Between lockdowns 1 &amp; 2: Melbourne</b>	1.19 (0.27)	0.76 – 1.85	0.45
<b>During lockdown 2: Melbourne</b>	1.26 (0.16)	0.98 – 1.63	0.07
<b>After lockdown 2: Melbourne</b>	1.37 (0.18)	1.05 – 1.78	<b>0.02</b>

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	Relative risk (SE)	CI	p
Melbourne recruitment	0.76 (0.06)	0.65 – 0.88	<0.001
COVID-19 restriction period (Ref: Pre-COVID)			0.01
During lockdown 1	→ 0.46 (0.13)	0.27 – 0.79	0.01
Between lockdowns 1 & 2	0.91 (0.18)	0.61 – 1.34	0.63
During lockdown 2	→ 0.76 (0.08)	0.62 – 0.92	0.01
After lockdown 2	→ 0.70 (0.08)	0.56 – 0.86	0.01
Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)			0.05
During lockdown 1: Melbourne			0.23
Between lockdowns 1 & 2: Melbourne			0.45
During lockdown 2: Melbourne	1.26 (0.16)	0.98 – 1.63	0.07
After lockdown 2: Melbourne	1.37 (0.18)	1.05 – 1.78	0.02

In regional Victoria, methamphetamine use frequencies during lockdown 1, during lockdown 2, and after lockdown 2 were significantly lower than in pre-COVID period by a factor of 46% (95%CI:0.27-0.79, p=0.01), 76% (95%CI:0.62-0.92, p=0.01), and 70% (95%CI:0.56-0.86, p<0.0001) respectively

# Results – Methamphetamine use frequency

Covariates	Methamphetamine use frequency		
	Relative risk (SE)	CI	p
Melbourne recruitment	0.76 (0.06)	0.65 – 0.88	<0.001
COVID-19 restriction period (Ref: Pre-COVID)			0.01
During lockdown 1	0.46 (0.13)	0.27 – 0.79	0.01
Between lockdowns 1 & 2	0.91 (0.18)	0.61 – 1.34	0.63
During lockdown 2	0.76 (0.08)	0.62 – 0.92	0.01
After lockdown 2	0.70 (0.08)	0.56 – 0.86	0.01
Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)	<p>In metropolitan Melbourne, methamphetamine use frequencies <i>during lockdown 1</i> was significantly lower than in pre-COVID period by a factor of 69% (95%CI:0.46-1.05, p=0.08)</p>		
During lockdown 1: Melbourne	1.51 (0.52)	0.77 – 2.98	0.23
Between lockdowns 1 & 2: Melbourne	1.19 (0.27)	0.76 – 1.85	0.45
During lockdown 2: Melbourne	1.26 (0.16)	0.98 – 1.63	0.07
After lockdown 2: Melbourne	1.37 (0.18)	1.05 – 1.78	0.02

## Analysis on frequency of other drug use

- Participants were asked about their use of **tobacco, alcohol and other illicit drugs**
- These frequencies were also measured as the average number of days per week used in the last month
- Illicit drugs include non-prescribed pharmaceutical stimulants (e.g., dexamphetamine), ecstasy/MDMA, cocaine, GHB/GBL/1,4-B, ketamine, benzodiazepines (e.g., Valium, Xanax), heroin, illicit non-prescribed pharmacotherapy, amyl nitrate/poppers, cannabis/pot/weed/marijuana, other non-prescribed illicit opiates (e.g., morphine, oxycodone), other inhalants (e.g., nitrous, paint, petrol), hallucinogens, illicit antipsychotics and illicit pregabalin

# Results - Frequency of other drug use

	Alcohol use frequency		Tobacco use frequency		Other illicit drug use frequency	
Covariates	Relative risk (SE)	p	Relative risk (SE)	p	Relative risk (SE)	p
<b>Melbourne recruitment</b>	1.24 (0.14)	<b>0.052</b>	0.96 (0.05)	0.491	0.77 (0.09)	<b>0.027</b>
<b>COVID-19 restriction period (Ref: Pre-COVID)</b>		0.96		<b>&lt;0.0001</b>		<b>0.03</b>
<b>During lockdown 1</b>	1.00 (0.12)	0.97	0.94 (0.06)	0.32	1.12 (0.23)	0.58
<b>Between lockdowns 1 &amp; 2</b>	1.00 (0.14)	0.99	0.88 (0.06)	0.06	1.55 (0.37)	0.06
<b>During lockdown 2</b>	0.93 (0.10)	0.51	0.86 (0.04)	<b>0.01</b>	1.06 (0.15)	0.66
<b>After lockdown 2</b>	0.95 (0.11)	0.67	0.78 (0.04)	<b>&lt;0.0001</b>	0.71 (0.11)	<b>0.02</b>
<b>Interaction between COVID-19 restriction period &amp; recruitment location (Ref: Pre-COVID &amp; regional Vic)</b>						0.36
<b>During lockdown 1: Melbourne</b>	..	..	..	..	0.88 (0.23)	0.62
<b>Between lockdowns 1 &amp; 2: Melbourne</b>	..	..	..	..	0.59 (0.17)	0.07
<b>During lockdown 2: Melbourne</b>	..	..	..	..	0.87 (0.16)	0.44
<b>After lockdown 2: Melbourne</b>	..	..	..	..	1.07 (0.20)	0.72

# Results - Frequency of other drug use

	Alcohol use frequency		Tobacco use frequency		Other illicit drug use frequency	
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<b>Melbourne recruitment</b>	1.24 (0.14)	<b>0.052</b>	0.96 (0.05)	0.491	0.77 (0.09)	<b>0.027</b>
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<b>Between lockdowns 1 &amp; 2</b>	1.00 (0.14)	0.99	0.88 (0.06)	0.06	1.55 (0.37)	0.06
<b>During lockdown 2</b>	0.93 (0.10)	0.51	0.86 (0.04)	<b>0.01</b>	1.06 (0.15)	0.66
<b>After lockdown 2</b>	0.95 (0.11)	0.67	0.78 (0.04)	<b>&lt;0.0001</b>	0.71 (0.11)	<b>0.02</b>
<b>Interaction between COVID-19 restriction period &amp; recruitment location (Ref: Pre-COVID &amp; regional Vic)</b>	<b>There was no effect of restriction period on the use frequencies of alcohol</b>					0.36
<b>During lockdown 1: Melbourne</b>	..	..	..	..	0.88 (0.23)	0.62
<b>Between lockdowns 1 &amp; 2: Melbourne</b>	..	..	..	..	0.59 (0.17)	0.07
<b>During lockdown 2: Melbourne</b>	..	..	..	..	0.87 (0.16)	0.44
<b>After lockdown 2: Melbourne</b>	..	..	..	..	1.07 (0.20)	0.72



# Results - Frequency of other drug use

	Alcohol use frequency		Tobacco use frequency		Other illicit drug use frequency	
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<b>During lockdown 2</b>	0.93 (0.10)	0.51	0.86 (0.04)	<b>0.01</b>	1.06 (0.15)	0.66
<b>After lockdown 2</b>	0.95 (0.11)	0.67	0.78 (0.04)	<b>&lt;0.0001</b>	0.71 (0.11)	<b>0.02</b>
<b>Interaction between COVID-19 restriction period &amp; recruitment location (Ref: Pre-COVID &amp; regional Vic)</b>	<div style="border: 2px solid black; padding: 5px;"> <p><b>Compared to <i>pre-COVID</i> period, tobacco use frequency decreased significantly during lockdown 2 and after lockdown 2 by 14% and 22% respectively</b></p> </div>					0.36
<b>During lockdown 1: Melbourne</b>	..	..	..	..	0.88 (0.23)	0.62
<b>Between lockdowns 1 &amp; 2: Melbourne</b>	..	..	..	..	0.59 (0.17)	0.07
<b>During lockdown 2: Melbourne</b>	..	..	..	..	0.87 (0.16)	0.44
<b>After lockdown 2: Melbourne</b>	..	..	..	..	1.07 (0.20)	0.72

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<b>COVID-19 restriction period (Ref: Pre-COVID)</b>		0.96		<b>&lt;0.0001</b>		<b>0.03</b>
<b>During lockdown 1</b>	1.00 (0.12)	0.97	0.94 (0.06)	0.32	1.12 (0.23)	0.58
<b>Between lockdowns 1 &amp; 2</b>	1.00 (0.14)	0.99	0.88 (0.06)	0.06	1.55 (0.37)	0.06
<b>During lockdown 2</b>	0.93 (0.10)	0.51	0.86 (0.04)	<b>0.01</b>	1.06 (0.15)	0.66
<b>After lockdown 2</b>	0.95 (0.11)	0.67	0.78 (0.04)	<b>&lt;0.0001</b>	<b>0.71 (0.11)</b>	<b>0.02</b>
<b>Interaction between COVID-19 restriction period &amp; recruitment location (Ref: Pre-COVID &amp; regional Vic)</b>	<div style="border: 2px solid black; padding: 5px;"> <p><b>Other illicit drugs use frequency decreased significantly after lockdown 2 by 29% (RR=0.71, 95%CI:0.52-0.95, p=0.02) compared to pre-COVID figures in regional Victoria</b></p> </div>					0.36
<b>During lockdown 1: Melbourne</b>	..	..	..	..	0.88 (0.23)	0.62
<b>Between lockdowns 1 &amp; 2: Melbourne</b>	..	..	..	..	0.59 (0.17)	0.07
<b>During lockdown 2: Melbourne</b>	..	..	..	..	0.87 (0.16)	0.44
<b>After lockdown 2: Melbourne</b>	..	..	..	..	1.07 (0.20)	0.72

# Results - Frequency of other drug use

	Alcohol use frequency		Tobacco use frequency		Other illicit drug use frequency	
Covariates	Relative risk (SE)	p	Relative risk (SE)	p	Relative risk (SE)	p
<b>Melbourne recruitment</b>	1.24 (0.14)	<b>0.052</b>	0.96 (0.05)	0.491	0.77 (0.09)	<b>0.027</b>
<b>COVID-19 restriction period (Ref: Pre-COVID)</b>		0.96		<b>&lt;0.0001</b>		<b>0.03</b>
During lockdown 1	1.00 (0.12)	0.97	0.94 (0.06)	0.32	1.12 (0.23)	0.58
Between lockdowns 1 & 2	1.00 (0.14)	0.99	0.88 (0.06)	0.06	1.55 (0.37)	0.06
During lockdown 2	0.93 (0.10)	0.51	0.86 (0.04)	<b>0.01</b>	1.06 (0.15)	0.66
After lockdown 2	0.95 (0.11)	0.67	0.78 (0.04)	<b>&lt;0.0001</b>	0.71 (0.11)	<b>0.02</b>
<b>Interaction between COVID-19 restriction period &amp; recruitment location (Ref: Pre-COVID &amp; regional Vic)</b>	<b>Other illicit drugs use frequency decreased significantly after lockdown 2 by 24% (RR=0.76, 95%CI:0.56-1.02, p=0.07) compared to pre-COVID figures in metropolitan Melbourne</b>					0.36
During lockdown 1: Melbourne	..	..	..	..	0.88 (0.23)	0.62
Between lockdowns 1 & 2: Melbourne	..	..	..	..	0.59 (0.17)	0.07
During lockdown 2: Melbourne	..	..	..	..	0.87 (0.16)	0.44
After lockdown 2: Melbourne	..	..	..	..	1.07 (0.20)	0.72

## Discussion

- Strong evidence of these COVID-19 restriction measures were related to **higher methamphetamine prices** and **reduced use**
- These effects were most **marked during lockdown 2**, when the most severe restrictions on movement in Melbourne were applied
- However, price increases were **larger in regional Victoria**, where restrictions on movement during lockdown 2 were less stringent (no curfew, no 5km limit on movement, no 1-hour limit on exercise)
- This effect probably reflects the so-called **'ring of steel'** around Melbourne – a hard border enforced by numerous police on all roads out. This coupled with similar intense enforcement of adjacent state borders, likely restricted the movement of illicit drug supply to regional Victoria and further increased prices
- Prices **did not return** to pre-COVID levels after harder restrictions were lifted, and **significantly higher** than pre-COVID measures. Similarly, methamphetamine and other drug use frequency **did not return** to pre-pandemic levels within the timeframe we considered
- The changes in methamphetamine use were **not** offset by changes in use of other illicit drugs or legally available drugs such as alcohol or tobacco; indeed, tobacco use **declined** during lockdowns

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***Thank you for your  
attention...!!!***

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# Additional materials

	Restrictions – Melbourne	Restrictions – Regional Victoria
<b>Lockdown 1</b> <b>From 16/03/2020 to 12/05/2020</b>	<ul style="list-style-type: none"> <li>- Suspended non-essential gatherings more than 100 people</li> <li>- Closed pubs, clubs, cinemas, entertainment venues, casinos, and night clubs</li> <li>- Two weeks mandatory quarantine for people arriving from overseas</li> <li>- Victorians are allowed to leave the house for four reasons: essential shopping for food and medical supplies, caregiving, essential work, and education, exercising</li> <li>- Restrictions on inside home (5 people) and outdoor (20 people) gatherings</li> </ul>	<ul style="list-style-type: none"> <li>- Suspended non-essential gatherings more than 100 people</li> <li>- Closed pubs, clubs, cinemas, entertainment venues, casinos, and night clubs</li> <li>- Two weeks mandatory quarantine for people arriving from overseas</li> <li>- Victorians are allowed to leave the house for four reasons: essential shopping for food and medical supplies, caregiving, essential work, and education, exercising</li> <li>- Restrictions on inside home (5 people) and outdoor (20 people) gatherings</li> </ul>
<b>Between Lockdowns 1 &amp; 2</b> <b>From 13/05/2020 to 30/06/2020</b>	<ul style="list-style-type: none"> <li>- Allowed private and public gatherings up to 20 visitors</li> <li>- Restaurants, cafes, and pubs are open for 20 seated patrons</li> <li>- Reduced private gatherings limit back to five visitors</li> </ul>	<ul style="list-style-type: none"> <li>- Allowed private and public gatherings up to 20 visitors</li> <li>- Restaurants, cafes, and pubs are open for 20 seated patrons</li> <li>- Reduced private gatherings limit back to five visitors</li> </ul>

	Restrictions – Melbourne	Restrictions – Regional Victoria
<b>Lockdown 2</b> <b>From</b> <b>01/07/2020</b> <b>to</b> <b>28/10/2020</b>	<ul style="list-style-type: none"> <li>- Stage 3* restrictions in place in Melbourne on 08/07/2020</li> <li>- 9 public housing estates moved to “hard lockdown”</li> <li>- Stage 4# restrictions in place in Melbourne on 02/08/2020</li> <li>- Stage 4 restrictions relaxed on 27/10/2020 including allowing public and private gatherings (limits apply) and open up hospitality venues, but can only travel up to 25km from home</li> </ul>	<ul style="list-style-type: none"> <li>- Stage 3* restrictions in place in regional Victoria on 05/08/2020</li> <li>- Restrictions to enter or leave Melbourne or Mitchell Shire (adjacent to the north of Melbourne)</li> <li>- Stage restrictions relaxed on 16/09/2020, but cannot travel to Melbourne</li> </ul>
<b>After</b> <b>Lockdown 2</b> <b>From</b> <b>29/10/2020</b> <b>to</b> <b>25/05/2021</b>	<ul style="list-style-type: none"> <li>- 25km travel restriction removed and intrastate travel allowed on 08/11/2020</li> <li>- COVID Safe summer introduced on 06/12/2020 including public gatherings up to 100 people and 30 visitors per home in a day</li> <li>- 5-day circuit breaker restrictions introduced on 12/02/2021 including only four reasons to leave home within 5km of home</li> <li>- Restrictions further relaxed including 100 people at home gatherings each day and 200 people outdoors</li> <li>- Restriction introduced to greater Melbourne on 25/05/2021 including public gatherings up to 30 people and five visitors per home in a day</li> </ul>	<ul style="list-style-type: none"> <li>- 25km travel restriction removed and intrastate travel allowed on 08/11/2020</li> <li>- COVID Safe summer introduced on 06/12/2020 including public gatherings up to 100 people and 30 visitors per home in a day</li> <li>- 5-day circuit breaker restrictions introduced on 12/02/2021 including only four reasons to leave home within 5km of home</li> <li>- Restrictions further relaxed including 100 people at home gatherings each day and 200 people outdoors</li> </ul>



### **\*Stage 3 restrictions:**

- Can leave home only for four reasons: essential shopping for food and medical supplies, caregiving, essential work, and education, exercising with one other person or household members
- Cafes and restaurants are open only for delivery and take-away
- Pubs, clubs, bars, and nightclubs are closed
- Beauty and personal services are closed
- Entertainment and cultural venues are closed
- Community sports are stopped

### **#Stage 4 restrictions:**

- In addition to the Stage 3 restrictions, the following restrictions were imposed:
- Curfew from 8pm to 5am
- Restrictions on travel up to 5km from home
- Exercise restricted to one hour outside a day with one other person
- One person per household can leave home for essential goods and service

# Results - price paid per gram of Methamphetamine

	Price paid per gram		
Covariates	Estimate (SE)	CI	p
Melbourne recruitment	-29.14 (19.16)	-66.75 – 8.47	0.129
COVID-19 restriction period (Ref: Pre-COVID)			<0.0001
During lockdown 1	7.74 (67.58)	-124.91 – 140.40	0.91
Between lockdowns 1 & 2	158.20 (45.87)	68.15 – 248.25	0.01
During lockdown 2	456.51 (27.41)	402.71 – 510.32	<0.0001
After lockdown 2	263.68 (30.81)	203.21 – 324.15	<0.0001
Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)	<b>Effect of location was significant only during lockdown 2 and the prices in regional Victoria higher than metropolitan Melbourne by AUD134.02 (95%CI:67.16-200.88, p&lt;0.001)</b>		0.06
During lockdown 1: Melbourne	-3.00 (89.18)	-178.06 – 172.05	0.97
Between lockdowns 1 & 2: Melbourne	-2.22 (55.73)	-111.61 – 107.17	0.97
During lockdown 2: Melbourne	-104.88 (35.40)	-174.37 – -35.39	0.01
After lockdown 2: Melbourne	-30.84 (39.58)	-108.53 – 46.84	0.44

# Results – Methamphetamine use frequency

	Methamphetamine use frequency		
Covariates	Relative risk (SE)	CI	p
Melbourne recruitment	0.76 (0.06)	0.65 – 0.88	<0.001
COVID-19 restriction period (Ref: Pre-COVID)			0.01
During lockdown 1	0.46 (0.13)	0.27 – 0.79	0.01
Between lockdowns 1 & 2	0.91 (0.18)	0.61 – 1.34	0.63
During lockdown 2	0.76 (0.08)	0.62 – 0.92	0.01
After lockdown 2	0.70 (0.08)	0.56 – 0.86	0.01
Interaction between COVID-19 restriction period and recruitment location (Ref: Pre-COVID and regional Victoria)	Effect of location was significant only <i>during pre-COVID</i> and the use frequencies in metropolitan Melbourne lower than regional Victoria by 24% (RR=0.76, 95%CI:0.65-0.88, p<0.0001)		
During lockdown 1: Melbourne	1.51 (0.52)	0.77 – 2.98	0.23
Between lockdowns 1 & 2: Melbourne	1.19 (0.27)	0.76 – 1.85	0.45
During lockdown 2: Melbourne	1.26 (0.16)	0.98 – 1.63	0.07
After lockdown 2: Melbourne	1.37 (0.18)	1.05 – 1.78	0.02