

Time-series analysis of presentations to four syringe dispensing machines and a needle and syringe program during COVID-19 lockdowns in Melbourne, Australia

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Introduction

- Australian harm reduction services include fixed-site needle and syringe programs (NSPs) and syringe dispensing machines (SDMs)
- SDMs provide 24-hour anonymous access to needles/syringes and can attract clientele who may choose not to use NSPs
- The introduction of COVID-19 control measures saw disruptions to harm reduction services
- It is possible that SDMs filled the gap in otherwise disrupted services
- In this paper, we explore changes in SDM and NSP usage during periods of government implemented COVID-19 lockdowns in Melbourne, Australia in 2020

Results

- Across the analysis period, 172,205 total orders were made across the four SDMs. We estimated 85,851 'unique' SDM presentations
- A total of 1,298,553 needles/syringes were dispensed via the SDMs and 1,717,800 needles/syringes were distributed through MCNSP over 29,051 unique presentations

Interrupted time-series analysis of SDM and NSP presentations

- In the SDM model, SDM unique presentations decreased significantly during the lockdown periods (Table 1, Figure 1)
- Raw MCNSP presentation data showed a decline, but this was not significant in ARIMA analysis (Table 1, Figure 2)

Table 1 – ARIMA models assessing the impact of lockdowns on the use of SDMs and on MCNSP presentations

	Estimate	P-value	95% CI
SDM model estimates¹			
Lockdown step	3.85	0.29	-3.22, 10.92
Lockdown trend	-0.12	0.03	-0.23, -0.01
MCNSP model estimates²			
Lockdown step	-32.1	0.71	-200.0, 135.8

1. N=1217, ARIMA(2,1,2), Portmanteau Q-test for residuals: p = 0.475

2. N=39, ARIMA(1,1,0), Portmanteau Q-test for residuals: p = 0.408

SDM model adjusted for month of year and day of week, MCNSP model for month of year

Discussion

- Though the decline in NSP presentations was not significant, it was part of an overall downward trend in MCNSP presentations, and consistent with declining NSP presentations nationally (2), which was accelerated due to COVID-19
- The decline in SDM presentations during lockdown periods was minimal and increased following lockdown end. The SDMs are integral to MCNSP needle and syringe distribution, with over 40% of all needles/syringes distributed via the SDMs
- While the slight, but significant decline in SDM use might suggest possible barriers to access, this may have been mitigated by SDM users acquiring needles/syringes from other sources, such as stockpiling from the NSP, as was encouraged
- Further work is needed to explore potential changes in needle/syringe acquisition and associated barriers. This work adds to the literature around the impacts of COVID-19 on harm reduction provision and potential areas of improvement

Methodology

Design and setting

- We utilise data from a primary fixed-site NSP (Monash Community NSP, MCNSP) in the public health catchment area of Monash Health, and four SDMs in multiple areas of south-east Melbourne (Dandenong, Berwick, Pakenham and Clayton)

Data and data preparation

- The SDMs automatically log data on time/day of SDM dispensation
- Victorian NSPs record data on client presentations via the Needle and Syringe Program Information System (NSPIS), provided as monthly aggregates
- The span of SDM and NSP comparative data was September 2017 to December 2020 (40 months)
- We presumed any SDM order made within 45-seconds of the previous order was made by the same 'unique' individual

Data analysis

- To assess the impacts from COVID-related restrictions (city-wide lockdowns between April 1 - May 12 and July 9 - October 27 2020 (1)), we analysed daily counts of unique SDM presentations, and monthly counts of MCNSP presentations
- Auto-regressive integrated moving average (ARIMA) time-series models were fitted to the data

SDM and NSP presentation trends

Figure 1 – Predicted values of unique SDM presentations

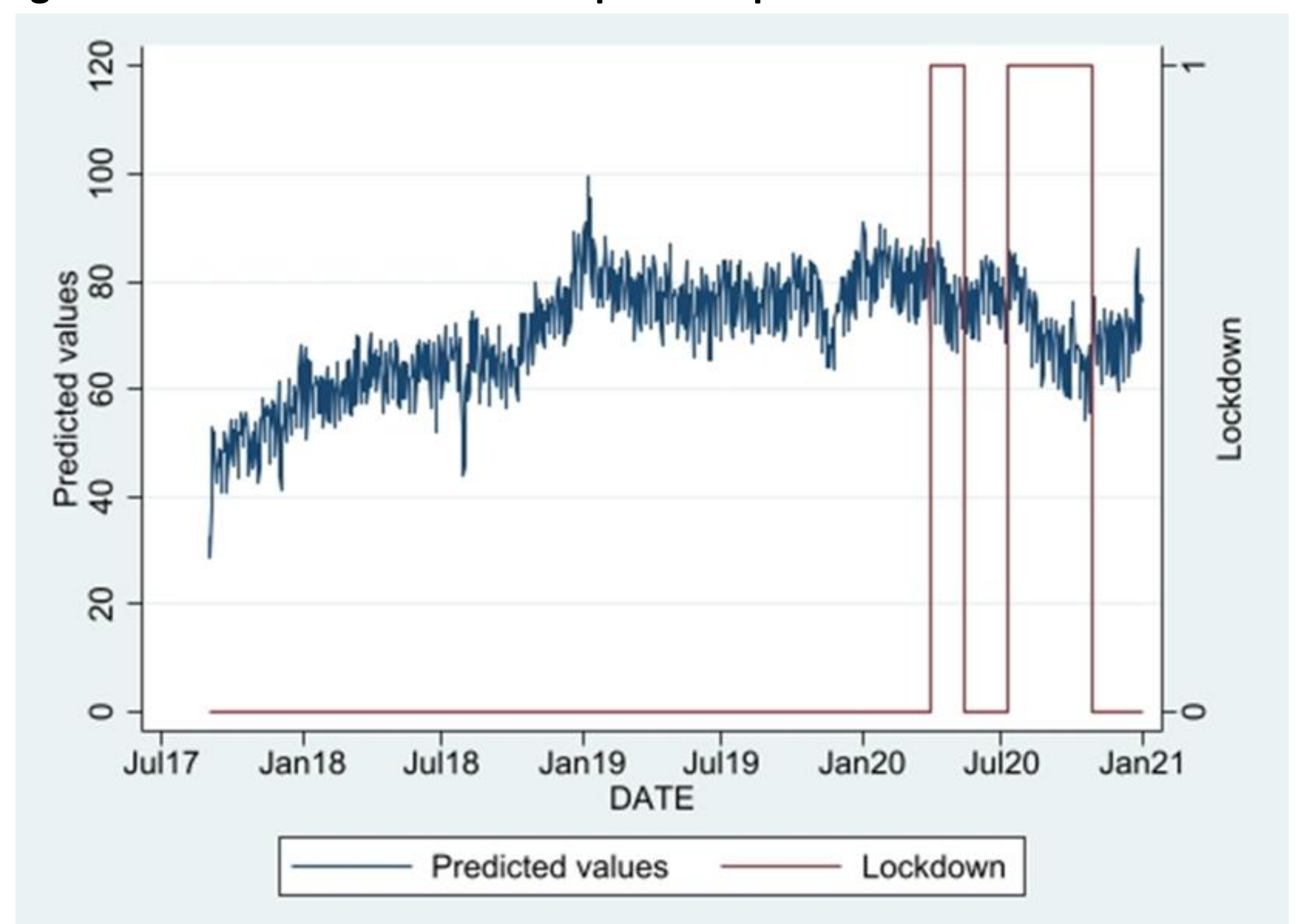
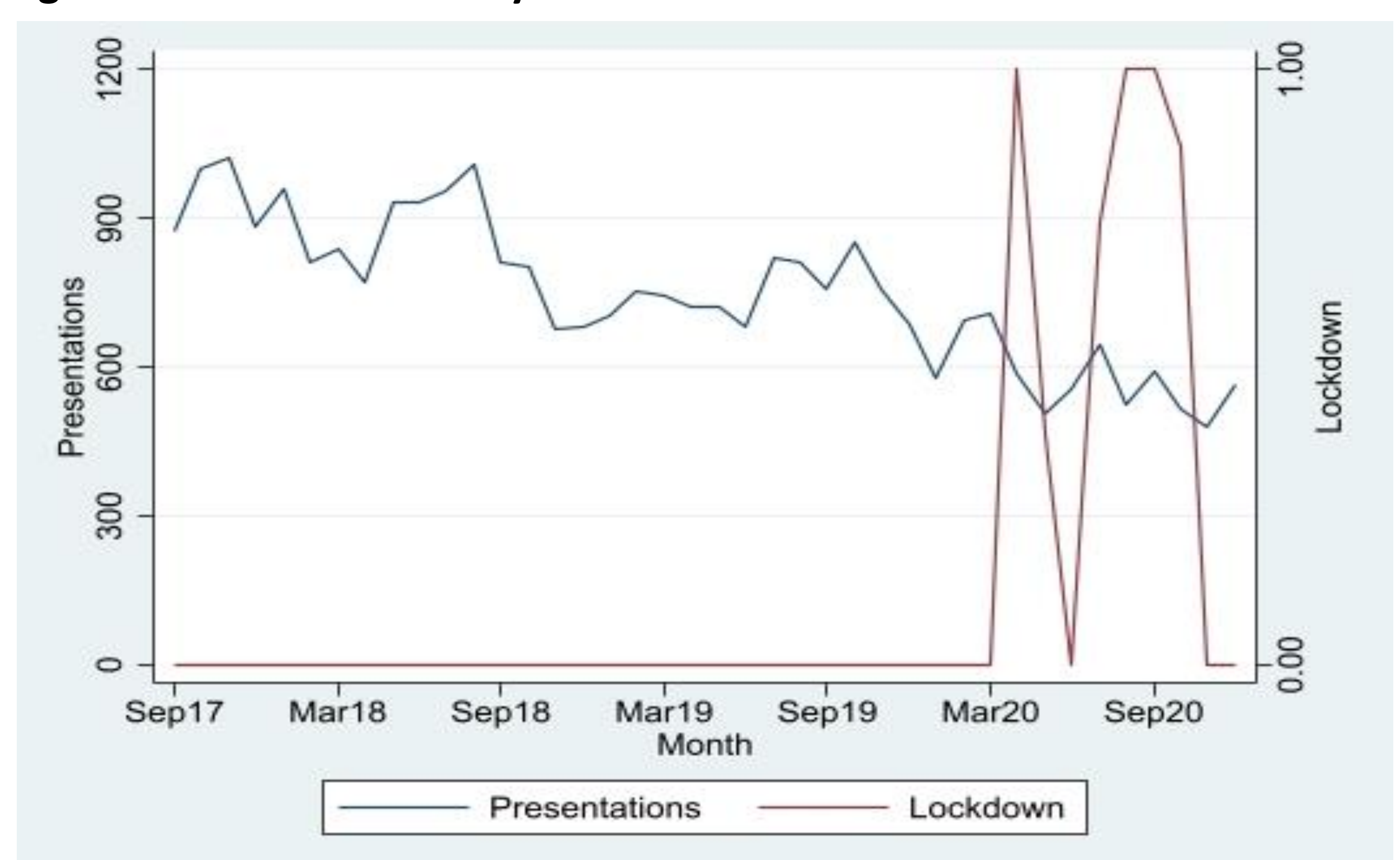


Figure 2 – Trend of monthly attendances at MCNSP



1. Dunstan J. Melbourne marks 200 days of COVID-19 lockdowns since the pandemic began. ABC News. 2021

2. Heard S, Iversen J, Geddes L, Kwon J, Maher L. Needle syringe program national minimum data collection: National data report 2021. Sydney, Australia: Kirby Institute, UNSW Sydney; 2021.

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