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Assessing the utility of Project STOP in reducing pseudoephedrine diversion to clandestine laboratories

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Foreword | *Project STOP, an online database in which pharmacists record sales of pseudoephedrine (PSE)-based medication, was implemented in 2005 to aid in reducing the diversion of PSE-based products for use as precursors in the domestic manufacture of methamphetamine. Australian evaluations of regulations governing the sale of PSE-based medications and the impact of Project STOP have so far been limited. This research explores the impact of the mandatory recording of PSE-based medication sales on PSE diversion and clan lab detection in Queensland.*

The findings show that Project STOP has demonstrated its utility for pharmacists in determining the legitimacy of requests for PSE-based medication, with 95 percent of Queensland pharmacies currently using it. When used consistently and appropriately, Project STOP reduces the amount of PSE-based medication leaving pharmacies for methamphetamine production. The research also highlights the challenges of attempting to curtail methamphetamine production in Australia and suggests new directions for research to better address these.

Chris Dawson APM

The supply of pseudoephedrine (PSE)-based products by pharmacists is regulated by national legislation that requires the mandatory electronic recording of PSE-based medication sales. First implemented in 2005, Project STOP is an online database that allows pharmacists to establish the legitimacy of PSE-based medication sales. This study evaluates its utility in reducing the diversion of PSE-based medications to clandestine laboratories (clan labs) in Queensland for methamphetamine production.

The drugs most commonly manufactured in Australian clan labs are amphetamine-type stimulants, or ATS (Australian Crime Commission 2013). PSE is the primary precursor chemical for manufacturing methamphetamine. A 2009 Siggins Miller review noted that law enforcement agencies estimated 90 percent of PSE then used in clan lab manufacture was sourced from pharmacies. In 2015, the Australian Crime Commission suggested that greater volumes of PSE were being detected at the Australian border, possibly due to difficulties sourcing PSE domestically following the implementation of Project STOP.

Background

There are multiple methamphetamine supply chains—the purely domestic and the international, which import either precursors or end product, as well as domestic manufacture and distribution (Ritter, Bright & Gong 2012). The domestic methamphetamine supply chain begins with the acquisition of precursors such as PSE, reagents and equipment. This is followed by the manufacture of drugs in predominately small (79%) illicit clan labs located in homes or car boots (Schloenhardt 2007) and their wide distribution through trafficking networks—interstate, regional and low-level street retail markets—throughout Australia (Ritter, Bright & Gong 2012). Unlike the United States, where

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methamphetamine supply is produced by larger 'super-labs', Australia's domestic methamphetamine supply is smaller in scale (Schloenhardt 2007).

The number of clan labs detected nationally has more than doubled over the last decade, increasing from 358 in 2003–04 to 757 in 2012–13 (Unick, Rosenblum, Mars & Ciccarone 2014). One reason for this increase is that methamphetamine is relatively cheap and easy to make, with a batch of methamphetamine ready in as little as two hours (Weisheit 2008). The necessary ingredients are commonly available and laboratories can be moved easily and set up in other locations (Weisheit 2008).

Strategies to reduce the diversion of PSE

A key challenge for Australian police is determining which part of the supply chain to focus their resources on (Ritter et al. 2012). Australia's law enforcement response to the domestic methamphetamine supply chain problem, like that of many other countries, has expanded to focus on precursor substances and equipment. Law enforcement strategies include partnering with pharmacists (Ransley et al. 2012).

Significant national legislative requirements, first implemented in 2006, underpin pharmacists' professional responsibilities in the supply of PSE products (Department of Health 2010). The Pharmacy Board of Australia can suspend a pharmacist's license; it can also take disciplinary action against any pharmacist whose dispensing practices are in breach of the Queensland Health (Drugs and Poisons) Regulation 1996, or who does not comply with the relevant Pharmaceutical Society of Australia Code of Practice (Pharmaceutical Society of Australia 2006a, 2006b).

In Queensland, Western Australia, the Northern Territory, South Australia and the Australian Capital Territory, the electronic recording of transactions relating to PSE-based medication is mandatory (Queensland Health, Pharmacy Guild of Australia & Queensland Police Service 2010; Sclavos 2013); whereas Victoria, Tasmania and New South Wales still operate under a voluntary reporting system (McGuffog 2013; Ransley et al. 2012). The voluntary reporting systems of these states require pharmacists to take all reasonable steps to identify the purchaser and determine whether the sale is legitimate (Ransley et al. 2012). There is no legislation requiring that sales be reported, or that police be advised of actual or suspected illegitimate sales.

Project STOP

Project STOP is an online database in which pharmacists record PSE-based medication sales. Its purpose is to aid in reducing the diversion of PSE-based products for use as precursors in the domestic manufacture of methamphetamine (Pharmacy Guild of Australia 2006).

A pilot of Project STOP was launched in Queensland in November 2005 (Parliamentary Joint Committee on the Australian Crime Commission 2006). Project STOP was included under the Australian National Precursor Strategy in 2007 (Ministerial Council on Drug Strategy 2008) and introduced nationally in 2008 (Ransley et al. 2012).

In practice, all requests for PSE-based medications are entered into Project STOP (Pharmacy Guild of Australia 2013). The pharmacist records the photo-identification card number of the customer and the product requested, and the database runs a check on the number. According to the Pharmacy Guild of Australia (PGA; 2013) the 'match screen' then provides the pharmacist with information to help them determine the legitimacy of the sale.

If the customer's identification number is associated with the purchase of at least one other PSE-based medication within the recommended therapeutic period, the pharmacist is able to view that individual's sales pattern for the preceding 100 days (PGA 2007). Most cold and flu medications containing PSE recommend a dose for adults and children over 12 years of two tablets, 3–4 times per day; that is, a maximum of eight tablets per day across three days, with a typical box of medication containing 24 tablets (equivalent to 720 mg of pseudoephedrine).

At this point the pharmacist is presented with three choices:

- to allow the sale;
- to make the sale but record it as a 'safety sale', indicating the pharmacist has concerns about the sale's legitimacy but is uncomfortable about confronting the customer; or
- to deny the sale due to concerns about its legitimacy (PGA 2007).

These data are electronically submitted to a single central repository managed by GuildLink Pty Ltd, collated, and returned to pharmacies.

Impacts of PSE-based medication regulation

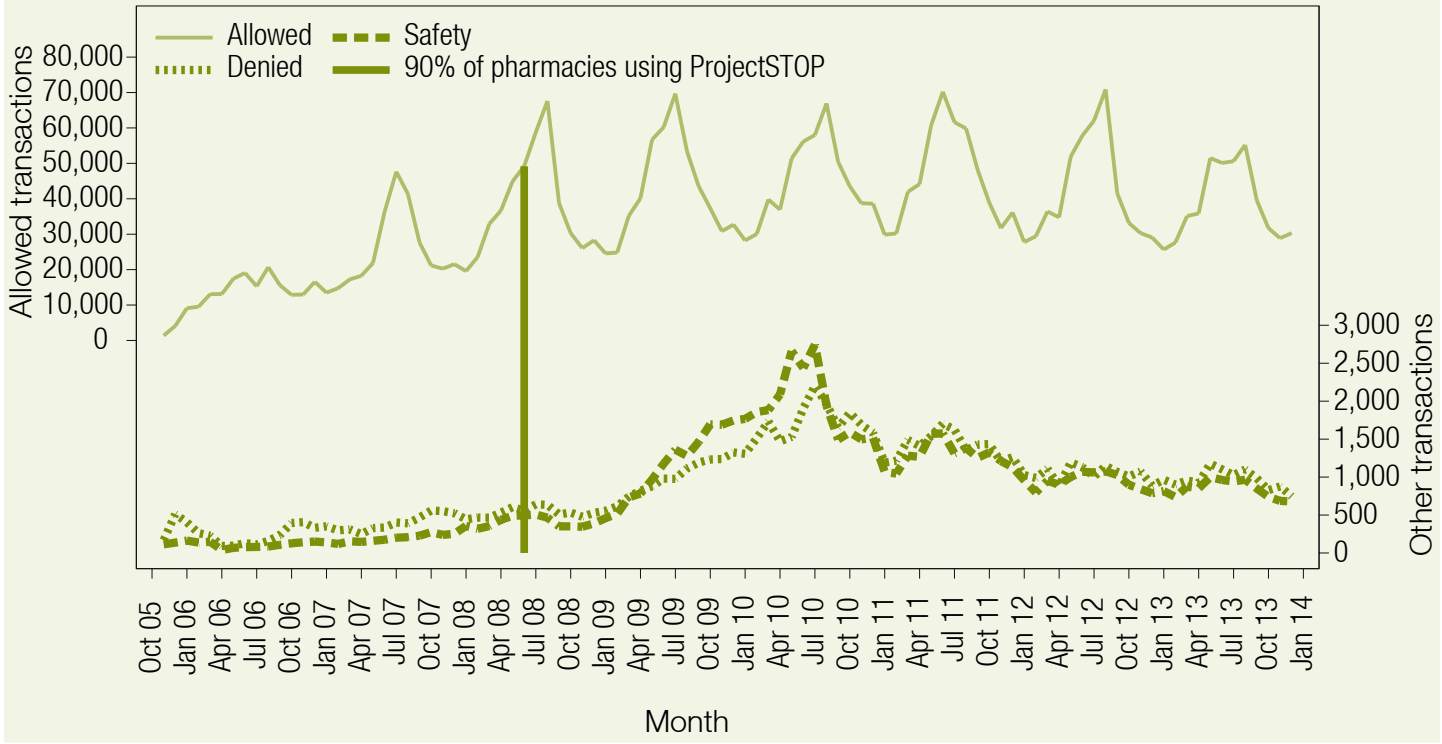
Australian evaluations of PSE-based medication regulations and Project STOP are limited (for exceptions, see Ransley et al. 2012; Siggins Miller 2009; Webster 2013). Berbatis, Sunderland, and Dhaliwal (2009) examined the impact of Project STOP on the number of ATS labs seized between 1996–97 and 2004–05 in Queensland. The authors conclude there were fewer lab seizures in Queensland in 2005–06, compared with other Australian jurisdictions. The study's major limitation was that, after Project STOP was rolled out in Queensland in November 2005, its uptake by pharmacies increased; its effect on clan lab detection in the year ending June 2006, therefore, may be underestimated.

The current research explores the impact of mandatory electronic recording of PSE-based medication sales on PSE diversion and clan lab detection in Queensland. Queensland is the focus of the report, as the first jurisdiction in Australia to adopt the software; it continues to be the most popular state for local methamphetamine production, based on the number of clan labs detected (Australian Crime Commission 2010; Queensland Health et al. 2010).

This study aims to:

- describe the uptake and use of Project STOP in Queensland between 2005 and 2013;
- examine the utility of Project STOP as an aid in reducing the diversion of PSE-based products for methamphetamine production; and
- assess the impact of Project STOP on clan lab detection.

Figure 1 Number of PSE-based medication transactions, by transaction type



Method

Description of data sources

PSE transaction data. The Director of GuildLink provided the de-identified Project STOP data for Queensland for the period of 8 November 2005 to 31 December 2013. Data were cleaned and prepared for analysis. The dataset consists of the pharmacy's unique identifier, its postcode, the date and time of the transaction, a description of the PSE-based medication requested and the customer's unique identifier. The unique customer identifier is based on the type of identification presented, which must be official photo identification such as a driver's licence or passport.

Clan lab detection data. The Queensland Police Service (QPS) drug squad provided data on clan lab detections between January 2004 and December 2013. This data was related to offences linked to a unique crime occurrence where ATS were detected.

Person-of-interest threshold and pseudo-runners. Pseudo-runners are individuals or groups who travel to various pharmacies to purchase PSE-based products legally, with the intention of diverting them for the manufacture of methamphetamine (PGA 2006). Suspected pseudo-runners were identified from Project STOP transaction data based on two indicators:

- the Queensland Police Service person-of-interest flag. The trigger for identifying a person of interest, or POI, is determined by police in each Australian jurisdiction. In some jurisdictions police are sent POI texts, while in others data is logged and a POI report run; and
- an individual's annual transaction history. Assuming an adult will suffer 2–4 colds in a one-year period, experience symptoms for up to two weeks and take the maximum daily dose of medication for up to one week (Simasek and Blandino 2007), they would need up to two and a half boxes of medication per cold—roughly 10 boxes of cold and flu medication annually. The transaction threshold for identifying potential pseudo-runners is 21 or more transactions per individual in a one-year period, or double this conservative estimate of ten boxes.

Analysis plan

Standard descriptive statistics and a time series analysis using the Joinpoint Regression Program were undertaken. Joinpoint regression (or piecewise regression) is an analytical method used for both linear and nonlinear models to identify significant changes in trend at one or more values of an independent variable, usually in a time series (Kim, Fay, Feuer & Midthune 2000). Joinpoint was used to estimate the monthly percent change for both the Project STOP transaction and methamphetamine clan lab detection data series.

Results

Uptake of Project STOP

When Project STOP was first rolled out in Queensland, it was used by 13 of 951 pharmacies. At the end of 2005, less than two months later, it was being used by 350 of 951 pharmacies. By the end of 2006, 695 of Queensland's 963 pharmacies, or 72 percent, had used Project STOP at least once. Over 90 percent were using Project STOP by June 2008; and by the end of 2015, 1,021 pharmacies—95 percent of pharmacies in Queensland—were using Project STOP.

PSE-based medication transactions by transaction type

On average, per month, allowed transactions account for 93.9 percent (SD 2.6) of all transactions, while safety transactions account for 2.1 percent (SD 1.3) and denied transactions for 2.4 percent (SD 1.4). Transaction trends across the eight-year

period vary by transaction type (see Figure 1). Trend patterns for safety and denied transactions are similar; however, the test for parallelism was significant (number of joinpoints=4, numerator df=9, denominator df=176; $p<0.001$); indicating that the estimated models for each series are not parallel and therefore cannot be represented by a single model.

The trendline for allowed transactions suggests one significant deviation across the series. The trend for the first section, November 2005 to July 2008, was 4.66 (2.91 to 6.44; $p<0.001$); for the second section, between July 2008 and December 2013, it was –0.27 (–0.66 to 0.12; $p=0.170$). This suggests that the estimated monthly rate of allowed transactions increased significantly—by 4.66 percent—between two consecutive months until July 2008. However, after this period the estimated rate does not differ significantly from a flat trend—that is, a rate of zero between any two consecutive months.

For safety transactions, there were four significant deviations across the series. The trend for the first section, November 2005 to February 2009, was positive and significantly increasing (4.52: 3.68 to 5.37; $p<0.001$). Following this there was a significant increase in the series. The trend for the second section, February 2009 to June 2009, was 22.38 (0.59 to 48.89; $p<0.05$). Between June 2009 and July 2010 the trend continued to increase significantly, by 5.86 percent between two consecutive months (5.86: 4.20 to 7.54; $p<0.001$).

The trend for the fourth section, July 2010 to October 2010, was decreasing but not significant (–17.82: –37.67 to 8.35; $p=0.158$). The trend for the final section was negative and significantly decreasing (–1.86: –2.22 to –1.49; $p<0.001$). These results suggest that the estimated monthly rate of safety transactions increased significantly between November 2005 and July 2010, but at differing rates. After July 2010 the rate of safety transactions substantially decreased; between October 2010 and December 2013 the rate declined significantly, by 1.86 percent.

Like the trend for safety transactions, the trendline for denied transactions suggests there were four significant deviations across the series. Overall, after an initial significant decrease of 17.35 percent in the rate of denied transactions between two consecutive months (–25.22 to –8.65; $p<0.001$), the estimated monthly rate of denied transactions significantly increased between July 2006 and July 2010, but at differing rates. For example, while the estimated monthly rate between July 2006 and October 2006 was positive, the rate does not significantly differ from a flat trend (47.64: –38.36 to 253.62; $p=0.375$). By contrast, the estimated monthly rate of denied transactions between December 2008 and July 2010 significantly increased, by 5.98 percent, between two consecutive months (4.60 to 7.39; $p<0.001$). After July 2010 the rate of denied transactions significantly decreased by 2.05 percent (–2.35 to –1.75; $p<0.001$).

Suspected pseudo-runner purchases

Based on the POI threshold, there have been 2,499 threshold breaches associated with 1,289 individuals who presented the same identification since the 2005 rollout of Project STOP. Of these 1,289 individuals, almost 90 percent (n=1,154) breached the threshold no more than once. For the remaining 135 individuals, the average number of attempted purchases was 3.17 (SE 0.15), with a range of between two and 50. The maximum number of breaches by any one person was 224; however, the mean number of breaches per individual was 1.94 (SE 0.04). The annual rate of breaches per 10,000 transactions was between 3.54 (2011) and 15.13 (2007). After 2007 there was a substantial decline in the annual percentage of breaches; for the last three years there were, on average, 4.23 breaches per 10,000 transactions.

Across the eight-year period, 75.1 percent of all transactions recorded were a single transaction per individual per year (n=2,382,697); annually, this ranged from 72 percent (2011) to 84.2 percent (2006; see Table 1). The study also examined transaction behaviour considered suspect according to the conservative regular annual transaction estimate of up to 10 transactions per year. Combining the data for 11 to 20 and 21 or more transactions, less than one percent (0.67%) of individuals in a given year purchased PSE-based medications this frequently. Across the eight years this percentage ranged from 0.23 percent in 2006 to one percent in 2010 (see Table 1).

The number of individuals who made 21 or more transactions spiked in 2010 (n=648). It dropped by 20 percent in 2011 and by 12 percent in 2012; there was virtually no change in 2013. The median number of transactions associated with these suspected pseudo-runners was typically 26 in any given year, equivalent to one transaction per fortnight. Across the eight-year period, the total number of transactions associated with suspected pseudo-runners was 92,405. For those individuals associated with more than 21 transactions in any one-year period, the median number of pharmacies visited during the eight-year period ranged from three (in 2012 and 2013) to 10.5 (in 2006); the eight-year median was five. The maximum number of pharmacies visited in any one-year period ranged between 19 in 2013 and 132 in 2007.

Clan lab detections

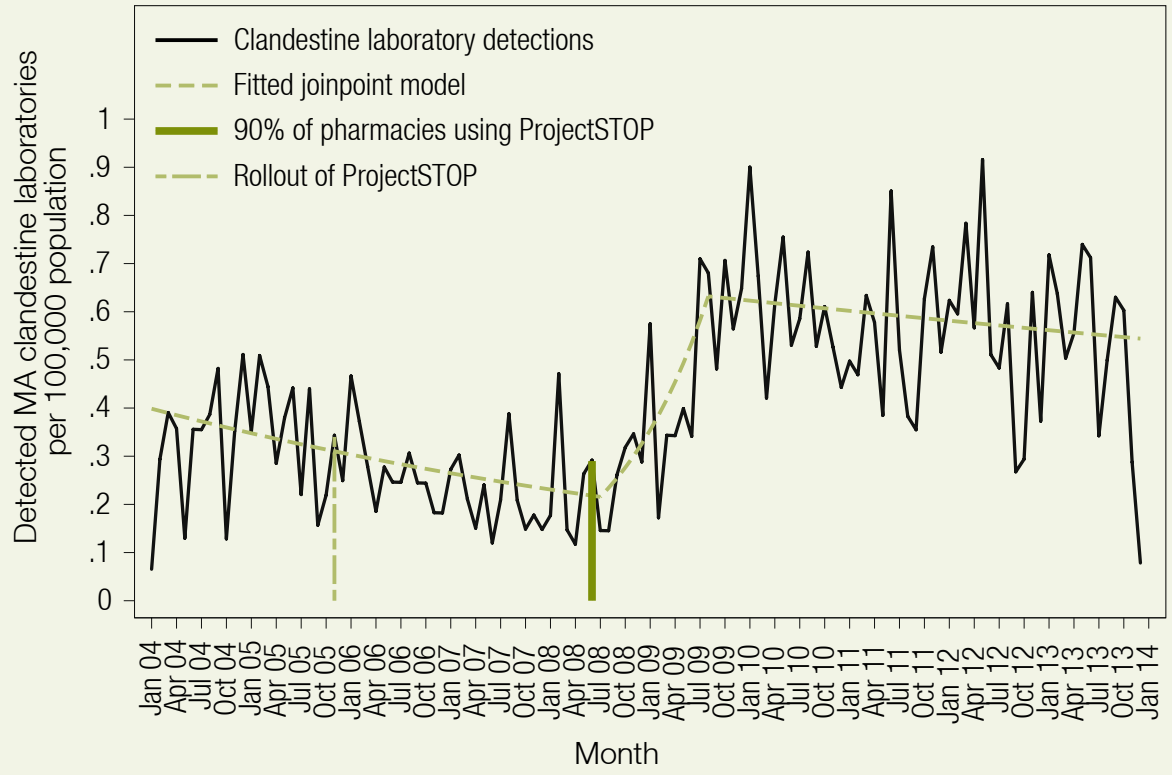
Figure 2 presents the data recorded by the QPS on monthly rates of methamphetamine clan lab detections; these are reported per 100,000 people aged 14 years and over. The dashed vertical black line (November 2005) indicates the introduction of Project STOP in Queensland. The red line (June 2008) indicates the point at which more than 90 percent of Queensland pharmacies were using Project STOP.

The trend for the first section of the series, January 2004 July 2008, was negative and significantly decreasing (–1.13:–1.82 to –0.44; $p<0.001$). Following this, there was a significant upturn in the series. The trend for the second section, July 2008 to August 2009, was 8.62 (2.69 to 14.90; $p<0.01$). The trend for the final section, August 2009 to December 2013, was decreasing but non-significant (–0.29: –0.77 to 0.19; $p=0.237$). These results suggest that, after an initial significant decrease between January 2004 and July 2008, there was a significant increase in detections. After April 2009, there was a downturn in the trend; but this rate did not significantly differ from a flat trend.

Table 1 Numbers of transactions per individual per year

	Year of transactions								
Number of transactions	2006	2007	2008	2009	2010	2011	2012	2013	Total
1	116,846 (84.2)	182,627 (80.6)	251,420 (77.3)	253,588 (74.7)	252,805 (72.4)	257,368 (72.0)	246,901 (73.4)	225,965 (73.9)	1,790,520 (75.1)
2	14.510 (10.5)	28,734 (12.5)	45,299 (13.9)	49,154 (14.5)	51,699 (14.8)	54,745 (15.3)	50,383 (15.0)	44,816 (14.6)	339,340 (14.2)
3–5	6,062 (4.4)	12,804 (5.6)	22,353 (6.9)	27,458 (8.1)	32,804 (9.4)	34,824 (9.7)	30,518 (9.1)	26,857 (8.8)	193,680 (8.1)
6–10	1,058 (0.8)	2,255 (1.0)	4,419 (1.4)	6,611 (1.9)	8,564 (2.5)	7,984 (2.2)	6,396 (1.9)	6,074 (2.0)	43,361 (1.8)
11–20	272 (0.2)	633 (0.3)	1,354 (0.4)	2,232 (0.7)	2,795 (0.8)	2,188 (0.6)	1,665 (0.5)	1,778 (0.6)	12,917 (0.5)
21+	54 (0.0)	128 (0.1)	291 (0.1)	590 (0.2)	648 (0.2)	519 (0.1)	458 (0.1)	461 (0.2)	3,149 (0.1)
Total	138,802	230,181	325,136	339,633	349,315	357,628	336,321	305,951	2,382,967

Figure 2 Rate of detected MA clan labs, January 2004 to December 2013



Discussion

Does Project STOP reduce the diversion of PSE-based medications?

The purpose of this study is to evaluate the utility of Project STOP in reducing the diversion of PSE-based products to clan labs. Using time-series analysis, the research illustrates an initial sharp increase in allowed PSE transactions between November 2005 and July 2008, when Queensland pharmacies were increasingly adopting Project STOP. Allowed transactions then plateaued between July 2008 and December 2013. These findings suggest that since Project STOP achieved 90 percent coverage of the state, Queensland pharmacies have experienced a stable rate of allowed PSE-based medication transactions.

The findings indicate similar trends in rates of both safety and denied transactions; these increased significantly between July 2006 and July 2010, then steadily declined to the end of the series in December 2013. It is plausible that following the initial period of Project STOP uptake, with the majority of pharmacies consistently utilising Project STOP between 2005 and 2010, there has been a reduction in the number of individuals attempting to obtain PSE-based medication for diversion to methamphetamine production.

Trends for suspected pseudo-runners—as determined by POI threshold, or who made

21 or more transactions in one year—are consistent with the safety and denied transaction trends. After 2007 there was a substantial decline in breaches; for the last three years of the study period the average rate of breaches was 4.23. Moreover, the number of individuals who made 21 or more transactions spiked in 2010; it dropped by 20 per cent in 2011 and by a further 12 per cent in 2012, and was virtually unchanged by 2013.

The threshold breach data identified 1,289 individuals considered POI. Using the 21 or more transactions per year estimate identified 3,149 suspected pseudo-runners. The large discrepancy in these two numbers highlights the possibility that individuals may intentionally avoid making purchases during the breach threshold period. The threshold timeframe should therefore be reviewed, to assist police in their investigations of pseudo-runners.

Does Project STOP impact clan lab detection?

With stable allowed PSE transaction trends and declining trends in safety transactions, denied transactions and suspected pseudo-runner activity, a decline in clan lab detections would be expected. This research finds the monthly rate of clan lab detections decreased significantly between January 2004 and July 2008, followed by a significant upturn between July 2008 and August 2009. After this time, detections plateaued to December 2013. Analysis of the clan lab detection data does not reflect the pattern that could be expected given the results of the Project STOP analysis.

Four explanations are offered for the clan lab detection trend: the importation of PSE into Queensland, changes in cooking methods, changes in police practices and a greater number of small clan labs.

- The clan lab patterns described may be a result of the importation of PSE-based medications from other jurisdictions (interstate or international). Consequently, any observable effect of Project STOP on methamphetamine production in Queensland may have been masked by access to PSE from outside Queensland. Between 2005 and 2008 Queensland was the only jurisdiction to implement Project STOP, so it is highly likely that during this period PSE-based medication was supplied across state borders. Without the adoption of a uniform solution, such as Project STOP, to PSE-based medication diversion across pharmacies in all states, interstate PSE trafficking is likely to continue.
- Methamphetamine cooks may have changed their cooking practices (Ritter et al. 2012). The majority of clan labs in Australia have been producing methamphetamine using the hypophosphorous acid method, which requires PSE as a precursor (National Drug Research Institute & Australian Institute of Criminology 2007); they may now be using the phenyl-2-propanone (P2P) method, or other methods which do not require PSE as a precursor, in response to restrictions on PSE-based medications (Ritter et al. 2012). This shift in cooking method may account for the absence of a decline in clan lab detection rates.
- During 2008 the QPS increased education and training for recruits, frontline police and detectives in the identification, detection and investigation of drug production offences (Senior Sergeant A Frost and Ms S Mayes personal communication 2014). Moreover, access to Project STOP was expanded to include district-level intelligence officers. This access allowed regional police to target PSE diversion, precursor procurers and the manufacture of methamphetamine; it also allowed intelligence officers to utilise Project STOP for secondary intelligence.
- Prior to 2008, the majority of clan lab seizures in Queensland were of small- to medium-scale labs using mostly scientific glassware and some improvised equipment. In 2008 precursor and equipment reporting controls were regulated, and there was a consequent reduction in the availability of chemicals and scientific equipment diverted for use. This reduction saw a shift in the equipment and scale of drug labs seized in Queensland. The QPS started to see more single-use improvised lab equipment, fashioned from non-controlled items, and the use of smaller quantities of precursor chemicals. This is likely to have contributed to the increase in smaller addiction-based labs and the reduction in medium-scale labs in Queensland.

Conclusion and implications

The findings of the report show Project STOP is used by 95 percent of Queensland pharmacies. It has demonstrated its utility for pharmacists in determining the legitimacy of customer requests for PSE-based medication and, if used appropriately and consistently, can reduce the amount of PSE-based medication leaving pharmacies for methamphetamine production.

The findings of this study support anecdotal evidence reported by others (Ritter et al. 2012) that the problem of pseudo-runners appears to be declining in response to restrictions on the availability of PSE-based medications. However, this reduction does not appear to have translated to a decline in clan lab detections. Queensland continues to have the largest number of clan labs in Australia. Evidence from this research highlights the challenges of trying to curtail methamphetamine production in Australia.

The findings also highlight the limitations of a single POI police flag, with evidence showing that active pseudo-runner behaviour has not been flagged as a POI breach. Further research to develop a series of algorithms that can be applied to Project STOP data to better identify POIs is necessary. Better identification will allow more suspect purchasers to be identified. This intelligence could inform police investigations and aid pharmacists in identifying suspect purchasing.

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References

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Australian Crime Commission 2010. Illicit drug data report 2008–09. https://www.crimecommission.gov.au/publications/intelligence-products/illicit-drug-data-report/illicit-drug-data-report-2008-09

Australian Crime Commission 2013. *Illicit drug data report 2011–12*. https://www.crimecommission.gov.au/publications/intelligence-products/illicit-drug-data-report/illicit-drug-data-report-2011-12

Australian Crime Commission 2015. *The Australian methylamphetamine market: The national picture*. Canberra, Australia: ACC https://www.crimecommission.gov.au/publications/intelligence-products/unclassified-strategic-assessments/australian-methylamphetamine

Berbatis CG, Sunderland VB & Dhaliwal SS 2009. Linked electronic medication systems in community pharmacies for preventing pseudoephedrine diversion: A review of international practice and analysis of results in Australia. *Drug and Alcohol Review*, 28(6): 586–591. doi: 10.1111/j.1465-3362.2009.00051.x

Victorian Department of Health and Human Services 2010. *Guide to the Drugs, poisons and controlled substances regulations 2006.* https://www2.health.vic.gov.au/about/publications/policiesandguidelines/5/1/3/0/7/guide-dpcs-regulations-2006

Kim H-J, Fay MP, Feuer EJ & Midthune DN 2000. Permutation tests for joinpoint regression with applications to cancer rates. *Statistics in Medicine*, 19(3): 335–351.

McGuffog ID 2013. Drug use and drug control policy: Evaluating the impact of precursor regulation on drug user behaviour (PhD). Queensland: Griffith University.

Ministerial Council on Drug Strategy 2008. *National AmphetamineType Stimulant Strategy 2008–2011*. Canberra: Department of Health and Ageing

National Drug Research Institute & Australian Institute of Criminology 2007. *National Amphetamine-Type Stimulant Strategy Background Paper*. Canberra: Department of Health and Ageing.

Parliamentary Joint Committee on the Australian Crime Commission 2006. Queensland Government's submission to the Joint Standing Committee on the Australian Crime Commission's inquiry into amphetamines and other synthetic drug use.

Pharmaceutical Society of Australia 2006a. Code of practice—pseudoephedrine. http://www.psa.org.au/policies/code-of-practice-pseudoephedrine

Pharmaceutical Society of Australia 2006b. Pseudoephedrine diversion. *inPHARMation* 7(1).

Queensland Health, Pharmacy Guild of Australia & Queensland Police Service 2010. *Pseudoephedrine recording changes—mandatory July 1st 2010*. Brisbane: The State of Queensland.

Ransley J et al. 2012. *Reducing the methamphetamine problem in Australia: Evaluating innovative partnerships between police, pharmacies and other third parties* Monograph Series No. 39. Canberra: National Drug Law Enforcement Research Fund

Ritter, A, Bright D & Gong W 2012. *Evaluating drug law enforcement interventions directed towards methamphetamine in Australia*. Monograph No. 44. Canberra: National Drug Law Enforcement Research Fund

Schloenhardt A 2007. *The market for amphetamine-type stimulants and their precursors in Oceania.* Research and Public. Policy Series no. 81. Canberra: Australian Institute of Criminology

Sclavos K 2013. *Project STOP a value tool but it costs money to run*. Pharmacy Guild of Australia. http://www.pharmacynews.com.au/opinion/project-stop-a-value-tool-but-it-costs-money-to-ru

Siggins Miller 2009). *Evaluation and monitoring of the National Drug Strategy 2004–2009 final report, Volume 1: Findings and recommendations*.

Simasek M & Blandino DA 2007. Treatment of the common cold. *American Family Physician* 75(4): 515–520.

The Pharmacy Guild of Australia 2006. Submission to the Parliamentary Joint Committee on the Australian Crime Commission Inquiry into Amphetamines and Other Synthetic Drugs (AOSD). http://www.aph.gov.au/~/media/wopapub/senate/committee/acc_ctte/completed_inquiries/2004_07/aosd/submissions/sub026_pdf.ashx

The Pharmacy Guild of Australia 2007. *Project STOP—Pharmacist guide*. Canberra: PGA

The Pharmacy Guild of Australia 2013. *Project STOP: A Pharmacy Guild initiative.* http://www.guild.org.au/docs/default-source/public-documents/issues-and-resources/Fact-Sheets/project-stop.pdf?sfvrsn=0

Unick G, Rosenblum D, Mars S & Ciccarone D 2014. The relationship between US heroin market dynamics and heroin-related overdose, 1992–2008. *Addiction* 109(11): 1,889–1,898. doi: 10.1111/add.12664

Webster JL 2013. Assessing community pharmacist engagement in a policing partnership strategy to reduce the illicit diversion of pseudoephedrine products. *Research in Social Administrative Pharmacy* 9(6): 903–917. doi: 10.1016/j.sapharm.2013.02.003

Weisheit R 2008. Making methamphetamine. *Southern Rural Sociology* 23(2): 78–107.