Harold Rogers Prescription Drug Monitoring Program (PDMP)
Practitioner and Research Partnership Grant
2015-2019

**Awarded to: Reno Police Department, in partnership with the
University of Nevada Reno and Nevada State Board of Pharmacy**

Report of Program Findings – June 2019

Since the fall of 2015, the Reno Police Department has worked in partnership with the University of Nevada Reno and the Nevada Board of Pharmacy to conduct a large-scale analysis of data in the Nevada Prescription Monitoring Program (PMP), as a part of a Bureau of Justice Assistance-funded grant initiative. Aggregate, de-identified data was gathered from the PMP for the years 2011-2017 for this analysis. The goal of this project was to gain a greater understanding of the prescription misuse problem in Nevada and its intricacies, so that resources can be targeted more effectively in the future. This report summarizes some key findings from this project. Highlighted findings to be discussed include:

- Prevalence of risky/problematic behaviors among patients in the general population;
- Comparison of behaviors among the general public to those of the heroin-using population; notable distinctions between the two groups; and
- Prevalence of opioids being prescribed to individuals arrested for heroin related charges.

General Public – Risk Indicators

The first type of analysis discussed in this report involves potentially problematic behaviors on the part of patients, which may indicate they are at higher risk of prescription drug misuse, addiction and overdose. These are referred to interchangeably as risk indicators or problem indicators. The indicators used in this analysis are listed in figure 1 with their respective coefficients, which reflect the relative weight assigned to each indicator.

No.	High Risk Indicator*	Coefficient
1.	Patient has obtained prescriptions from 5 or more prescribers within 3 months (*"Doctor shopping"*)	0.8
2.	Patient has filled prescriptions at 5 or more pharmacies within 3 months (*"Pharmacy shopping"*)	0.8
3.	Patient is receiving more than 90 daily MME (morphine milligram equivalents)	0.5
4.	Patient has obtained an opioid, a benzodiazepine, and carisoprodol within 1 month (*"Holy Trinity"*)	0.9

5.	Patient has obtained an opioid and a benzodiazepine within 1 month	0.7
6.	Patient has paid cash for the prescription more than 90% of the time	0.5
7.	Patient has paid for the same drug using both insurance and cash within 1 year	0.8
8.	Patient has received prescriptions for more than 7 consecutive months during the course of one year	0.6

Figure 1

Indicators #1, 2, 3, 6, 7 and 8 are reflective <u>only</u> of the subset of data including opioid pill prescriptions, not all controlled substance prescriptions included in the PMP.

Overall, it was observed that **34.85%** of patients with any prescription history in the PMP had at least one risk indicator present during this time frame. The coefficient frequency by specific indicator – among those who had at least one indicator – is listed in figures 2-3.

No.	High Risk Indicator	# of People	Percent*
1.	Patient has obtained prescriptions from 5 or more prescribers within 3 months *("Doctor shopping")*	1,896	0.20%
2.	Patient has filled prescriptions at 5 or more pharmacies within 3 months *("Pharmacy shopping")*	326	0.03%
3.	Patient is receiving more than 90 daily MME (morphine milligram equivalents)	229,940	24.17%
4.	Patient has obtained an opioid, a benzodiazepine, and carisoprodol within 1 month *("Holy Trinity")*	9,257	0.97%
5.	Patient has obtained an opioid and a benzodiazepine within 1 month	70,969	7.46%
6.	Patient has paid cash for the prescription more than 90% of the time	245,261	25.78%
7.	Patient has paid for the same drug using both insurance and cash within 1 year	159,966	16.82%
8.	Patient has received prescriptions for more than 7 consecutive months during the course of one year	233,649	24.56%

Figure 2 (represents all of Nevada)

The most common problem indicators present in this population were:

1. Paying cash for a prescription more than 90% of the time
2. Receiving more than 7 consecutive months of prescriptions in a year
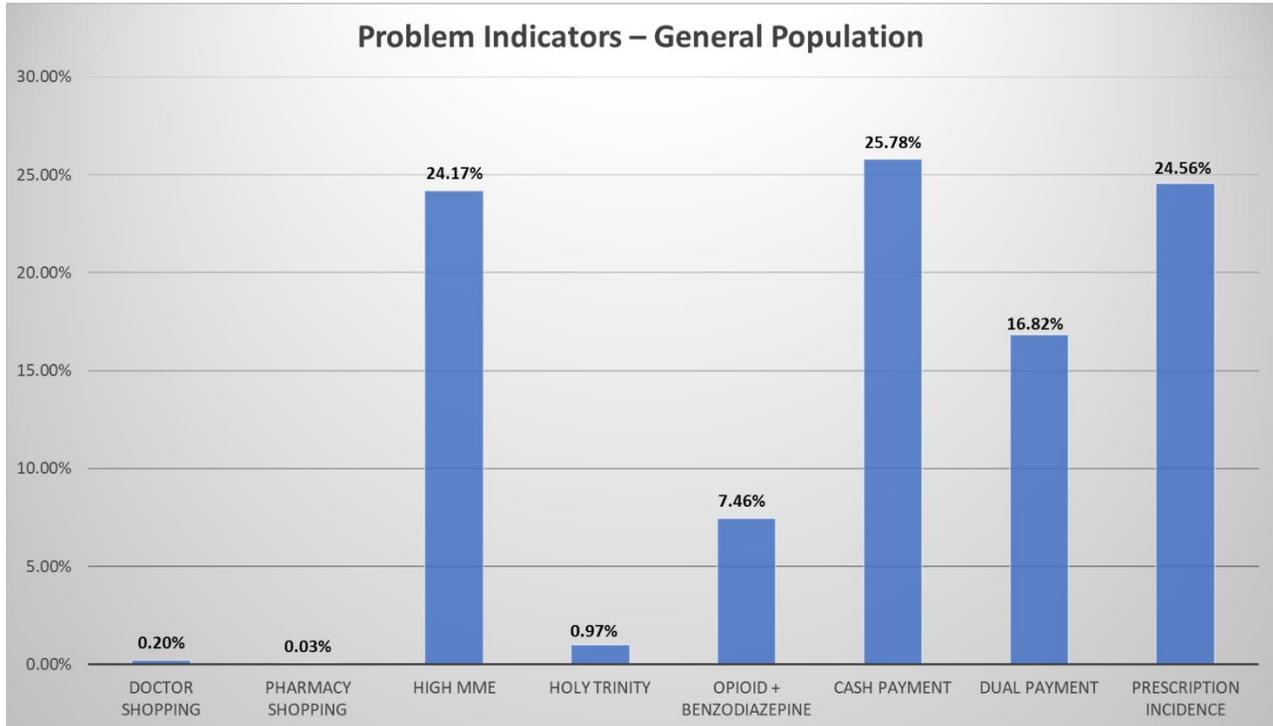3. Receiving greater than 90 daily MME

Figure 3 (represents all of Nevada)

These findings give a valuable glimpse into the prevalence of different potentially problematic behaviors among the general population in Nevada.

Heroin Using Population – Risk Indicators

For the next type of analysis, a specific subset of the population was examined: those who have been arrested for heroin related crimes. Data was collected on individuals that were arrested by the Reno Police Department or Washoe County Sheriff's Office for heroin related charges between 2011 and 2017 (n = 992). These records were then linked with the individuals' Nevada PMP histories, and de-identified so that potential trends could be studied. Goals of this analysis were to determine how frequently prescription opioid use co-occurs with heroin use, any distinctions in high-risk behaviors among these individuals as compared to the general public, and whether there appeared to be any linear progression between the use of prescribed opioids and the use of heroin.

Analysis revealed that **59%** of these heroin arrestee individuals had at least one opioid prescription filled during the 2011-2017 time period. Of those, 413 (**70.78%**) had at least one risk indicator present in their PMP histories – this represents a rate **double** that of the general population.

Among those with at least one risk indicator, it was also observed that the heroin arrestee population had a higher incidence of 2 or more indicators present compared to the general public (*figure 4*).
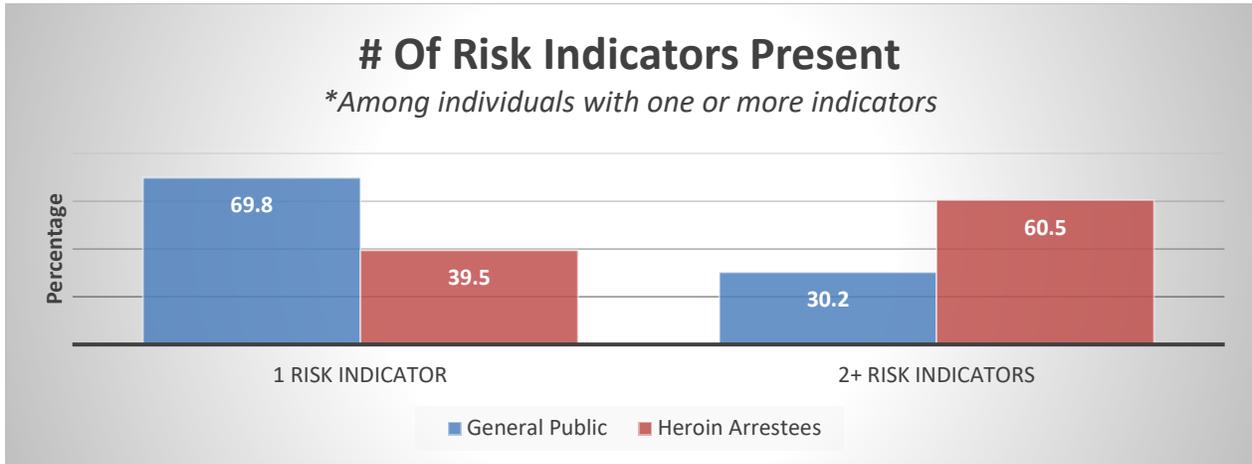
Of Risk Indicators Present
Among individuals with one or more indicators

Percentage

- 1 RISK INDICATOR: General Public 69.8, Heroin Arrestees 39.5
- 2+ RISK INDICATORS: General Public 30.2, Heroin Arrestees 60.5

■ General Public ■ Heroin Arrestees

Figure 4

When comparing the incidence of specific problem indicators among this population with that of the general population, several important deviations were observed (*figures 5-6*). Among the arrestee population, each specified indicator was present within 1 year of (prior to or after) the date of the individual's arrest for heroin related charges.
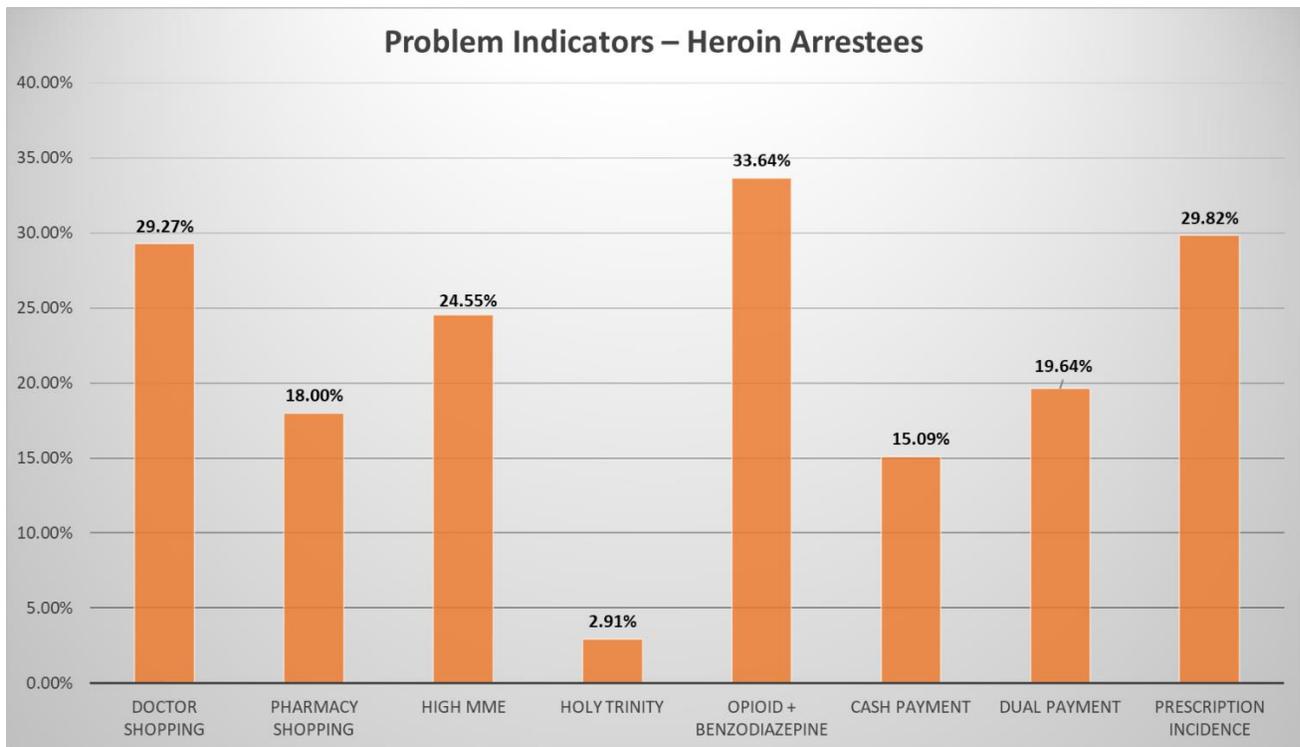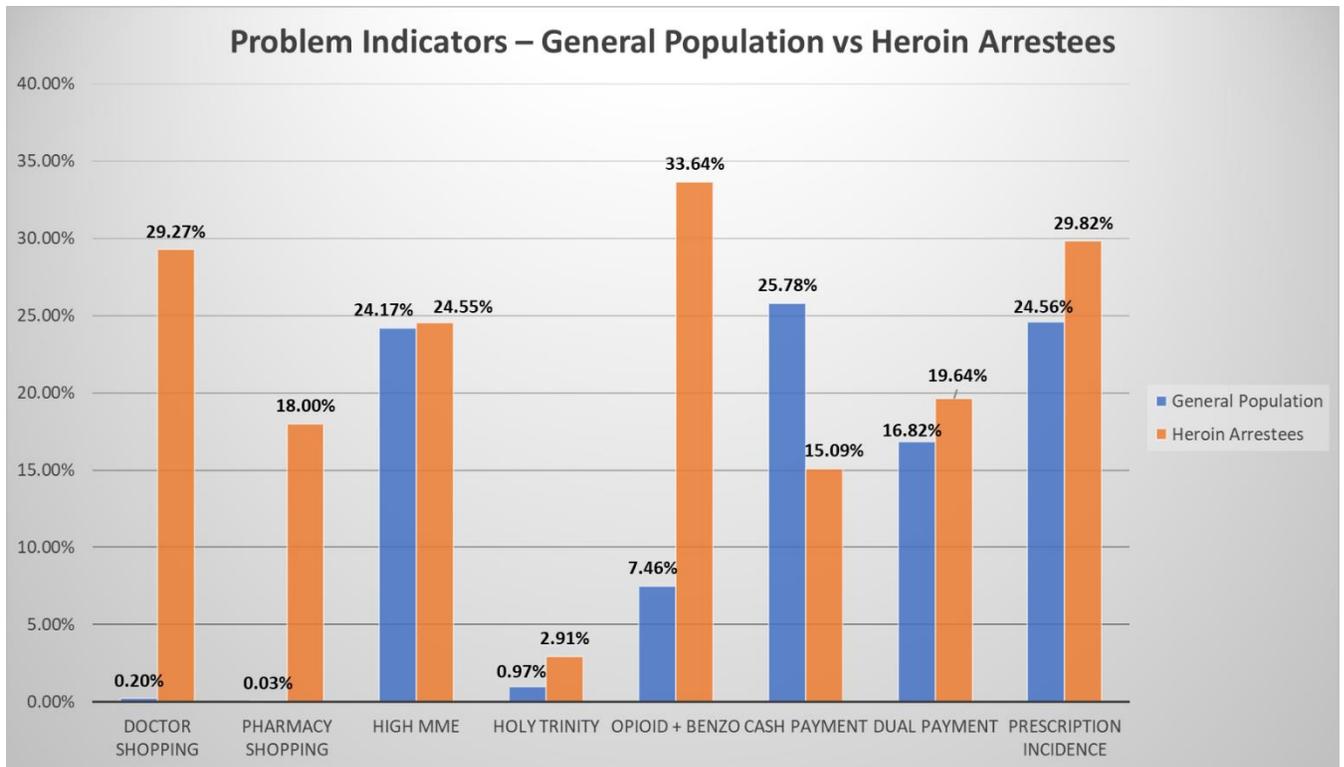
Problem Indicators – Heroin Arrestees

Indicator	Percentage
DOCTOR SHOPPING	29.27%
PHARMACY SHOPPING	18.00%
HIGH MME	24.55%
HOLY TRINITY	2.91%
OPIOID + BENZODIAZEPINE	33.64%
CASH PAYMENT	15.09%
DUAL PAYMENT	19.64%
PRESCRIPTION INCIDENCE	29.82%

Figure 5

4

Problem Indicators – General Population vs Heroin Arrestees

Category	General Population	Heroin Arrestees
DOCTOR SHOPPING	0.20%	29.27%
PHARMACY SHOPPING	0.03%	18.00%
HIGH MME	24.17%	24.55%
HOLY TRINITY	0.97%	2.91%
OPIOID + BENZO	7.46%	33.64%
CASH PAYMENT	25.78%	15.09%
DUAL PAYMENT	16.82%	19.64%
PRESCRIPTION INCIDENCE	24.56%	29.82%

Figure 6

Notable differences between the findings of these two populations include:

- **2 times higher** prevalence of problem/risk indications present among heroin arrestee population than among the general public

- Opioid + benzodiazepine combination (both drugs within 1 month): **4.5 times higher rate** among heroin users

- Doctor shopping (5+ doctors in 3 months): **146 times higher rate** among heroin users

- Pharmacy shopping (5+ pharmacies in 3 months): **600 times higher rate** among heroin users

Chronology of Prescriptions Relative to Arrest

Another form of analysis looked at the incidence of opioid prescriptions filled *before* versus *after* the date of the individual's heroin arrest. This was in an effort to discern any potential relationship between the use of these two substances - whether individuals using heroin tend to: use prescribed opioids only before initiating heroin use, begin using them only after initiating heroin use, or whether the use of the two substances happens concurrently. Findings showed that 20% of these individuals obtained an opioid prescription *within one year* before the date of their arrest, and 13% obtained such a prescription within one year after their arrest. Results of further analysis varied by drug type (*figures 7-11*). As

demonstrated in figure 7, nearly 40% of all opioids prescribed to this population were prescribed <u>after</u> the individual had been arrested for heroin related charges.
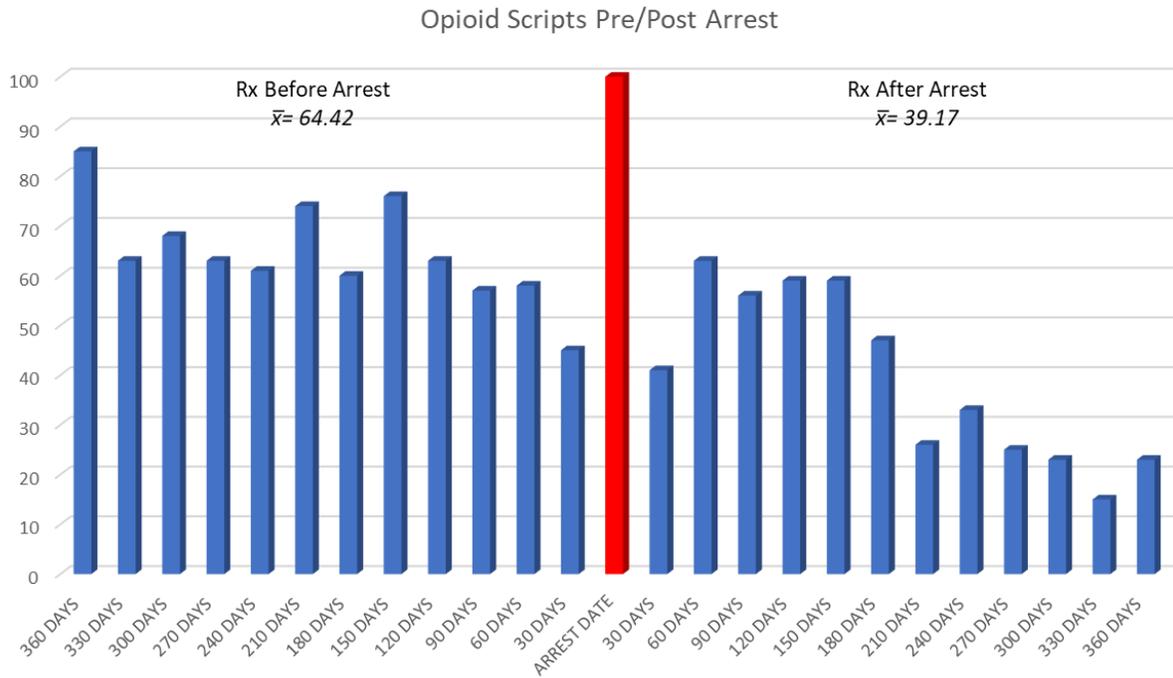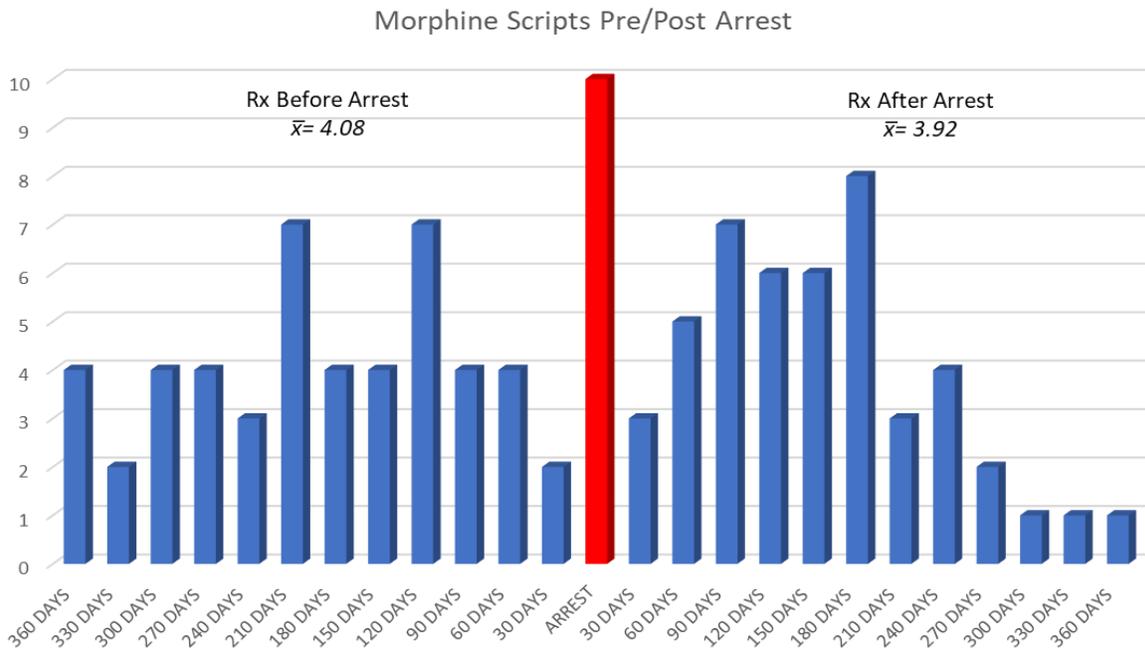
Opioid Scripts Pre/Post Arrest

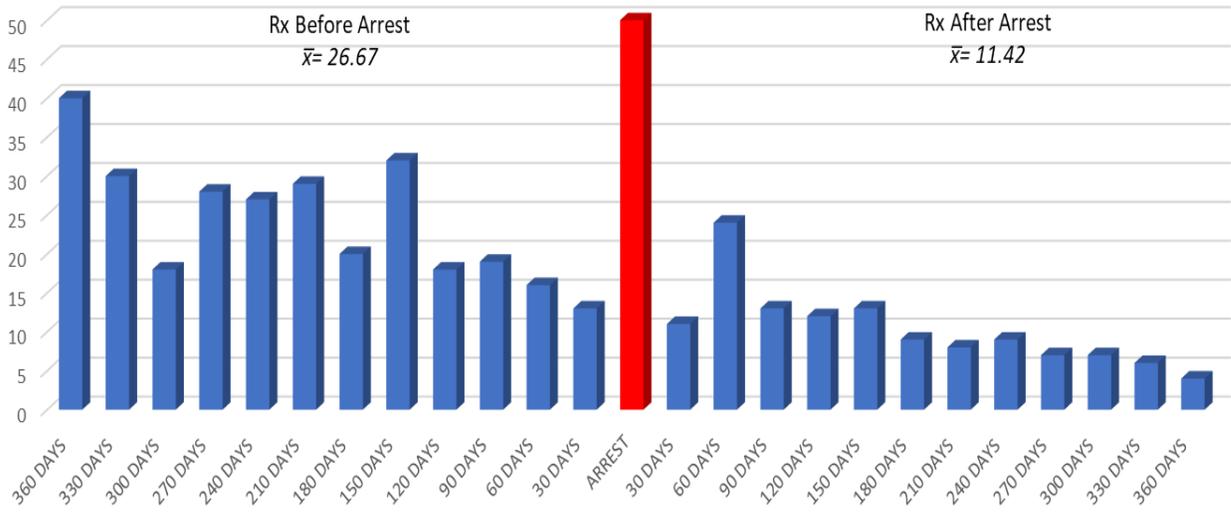Rx Before Arrest $\bar{x}= 64.42$

Rx After Arrest $\bar{x}= 39.17$

Figure 7

Morphine Scripts Pre/Post Arrest

Rx Before Arrest $\bar{x}= 4.08$

Rx After Arrest $\bar{x}= 3.92$

Figure 8

6

Oxycodone Scripts Pre/Post Arrest

Rx Before Arrest
$\bar{x}= 26.67$

Rx After Arrest
$\bar{x}= 11.42$

Figure 9

Hydrocodone Scripts Pre/Post Arrest

Rx Before Arrest
$\bar{x}= 22.50$

Rx After Arrest
$\bar{x}= 9.83$

Figure 10

Methadone Scripts Pre/Post Arrest

Rx Before Arrest
x̄= 5.17

Rx After Arrest
x̄= 4.33
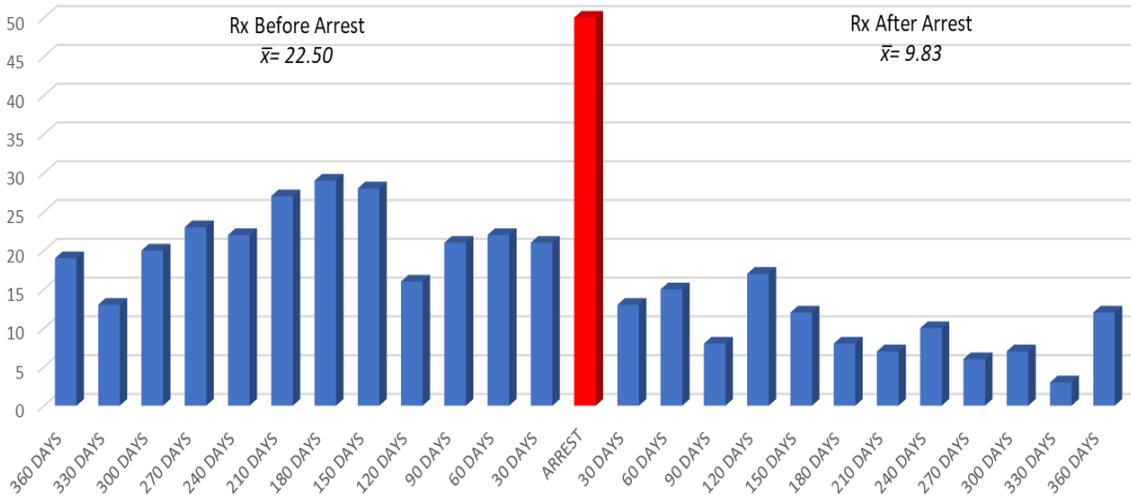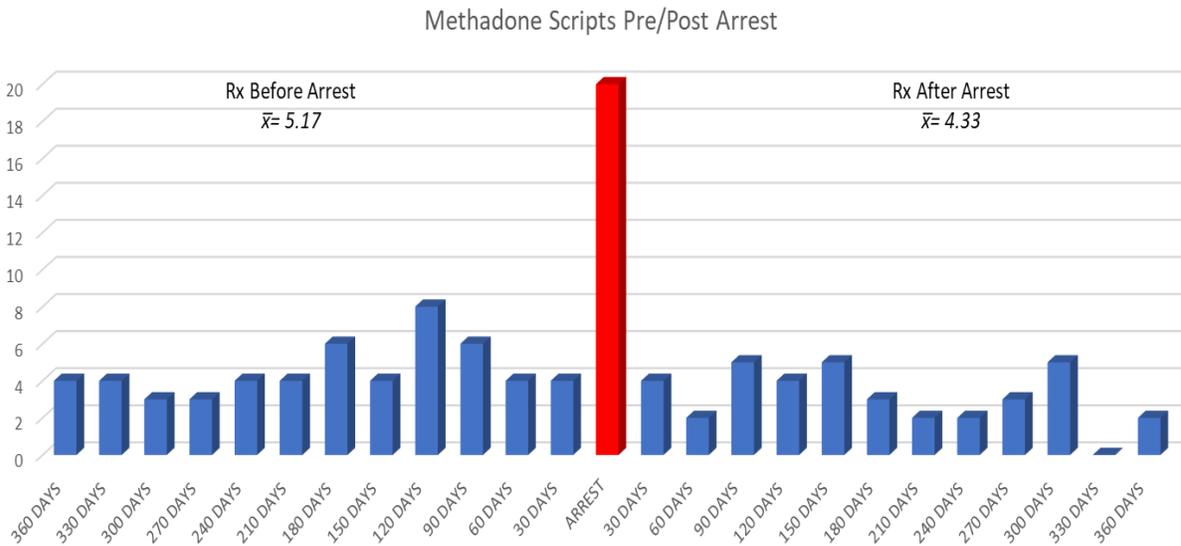
Figure 11

The exception to this pattern was buprenorphine, which was more commonly prescribed *after* the date of the individual's arrest than before (figure 12). This finding is unsurprising and seems to align with what would be expected, as buprenorphine is a medication prescribed to treat opioid addiction.

Buprenorphine Scripts Pre/Post Arrest

Rx Before Arrest
x̄= 3.00

Rx After Arrest
x̄= 6.77
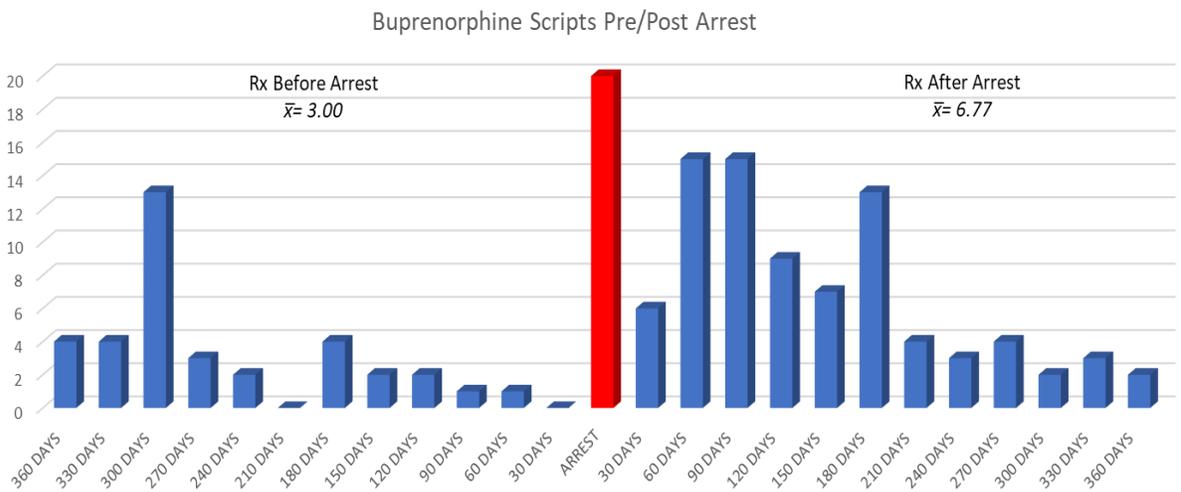
Figure 12

Summary and Discussion: Several valuable conclusions can be drawn from these findings. Primary among them is that abuse of and/or addiction to prescription opioids does not progress to heroin use in a strictly linear manner. Rather, the use of prescribed opioids occurs at comparable rates both before and after individuals are arrested for heroin related crimes. Practitioners should be aware that they may be seeing (and prescribing controlled substances to) patients that have already initiated heroin use, and

are thus at a very high risk of overdose. Brief screening of patients for substance use disorder and referral to appropriate treatment services is <u>critical</u> in the prevention of opioid-related overdose.

The other most significant finding is that there are particular risk indicators that show a higher correlation with heroin-related arrest (and thus, presumptive heroin use) than others, including patients visiting multiple prescribers and multiple pharmacies, and patients obtaining prescriptions for both opioids and benzodiazepines. As this information is accessible by practitioners via the prescription monitoring program prior to prescribing, greater scrutiny of patients' PMP records can give much-needed direction as to which individuals may be at greatest risk of misuse and addiction to both prescribed medications and to heroin, and therefore in most dire need of brief screening and intervention.

Questions regarding these findings can be directed to the principal researcher on this project, Dr. Emmanuel Barthe at the University of Nevada Reno: epbarthe@unr.edu.