



Nevada State  
Board of Pharmacy



University of Nevada, Reno

# Targeting Opioid Diversion

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2018 Problem-Oriented Policing  
Providence, Rhode Island

Reno Police Department  
Nevada State Board of Pharmacy  
University of Nevada, Reno

# Introduction

- ▶ Harold Rogers PDMP Research & Practitioner Partnership (FY2015)
  - ▶ Reno Police Department
  - ▶ University of Nevada
  - ▶ Nevada Board of Pharmacy
- ▶ Primary data source: Nevada Prescription Monitoring Program (PMP)
  - ▶ Aggregate PMP data collected for 2011-2017
  - ▶ Patient names de-identified completely



# THE OPIOID EPIDEMIC BY THE NUMBERS

IN 2016...



**116**

People died every day from opioid-related drug overdoses



**11.5 m**

People misused prescription opioids<sup>1</sup>



**42,249**

People died from overdosing on opioids<sup>2</sup>



**2.1 million**

People had an opioid use disorder<sup>1</sup>



**948,000**

People used heroin<sup>1</sup>



**170,000**

People used heroin for the first time<sup>1</sup>



**2.1 million**

People misused prescription opioids for the first time<sup>1</sup>



**17,087**

Deaths attributed to overdosing on commonly prescribed opioids<sup>2</sup>



**19,413**

Deaths attributed to overdosing on synthetic opioids other than methadone<sup>2</sup>



**15,469**

Deaths attributed to overdosing on heroin<sup>2</sup>



**504 billion**

In economic costs<sup>3</sup>

Sources: <sup>1</sup> 2016 National Survey on Drug Use and Health, <sup>2</sup> Mortality in the United States, 2016 NCHS Data Brief No. 293, December 2017, <sup>3</sup> CEA Report: The underestimated cost of the opioid crisis, 2017



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 CHLOROFORM, 2 1/5 m.  
 MORPHIA, SULPH., 1/8 gr.  
 SKILLFULLY COMBINED WITH A NUMBER  
 OF OTHER INGREDIENTS  
 DIRECTIONS



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7

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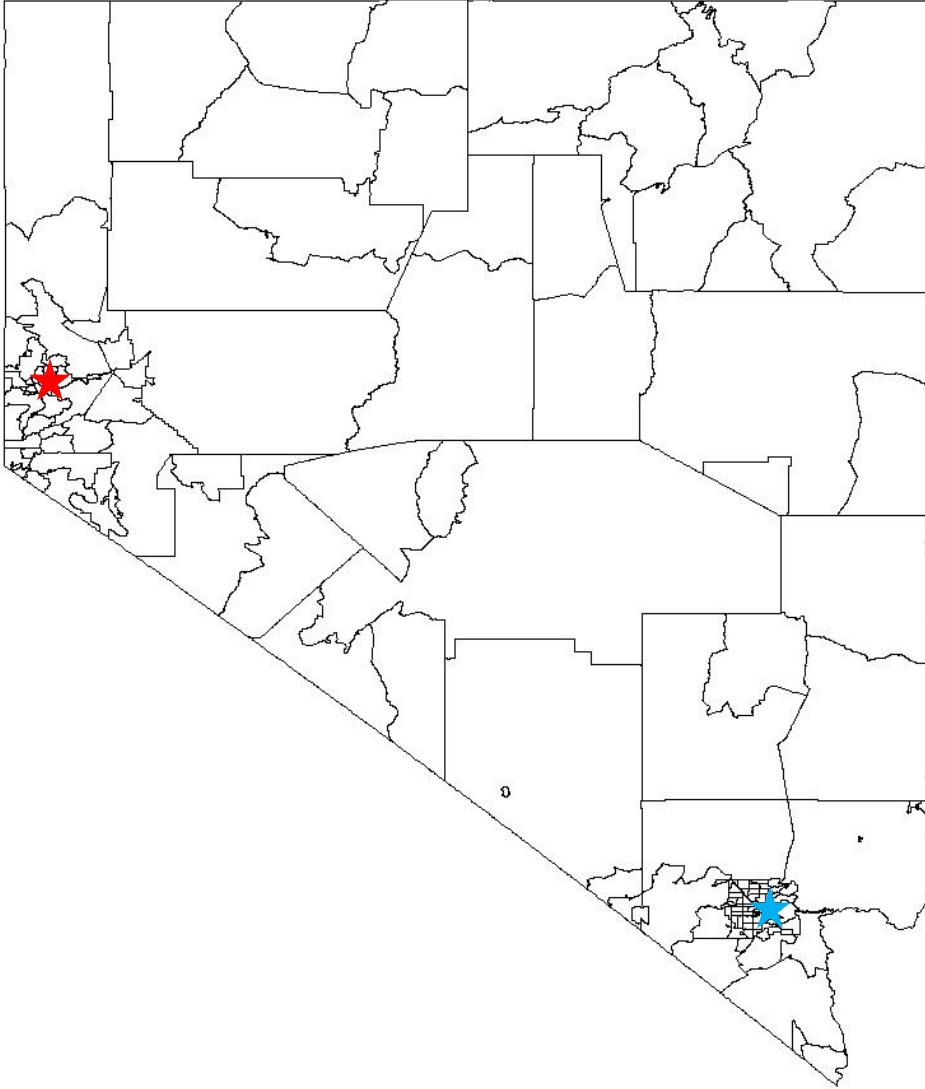
WRITE FOR DESCRIPTIVE PRICE LIST

**Nevada Population: 2.8  
m**

**(California pop. 38.4 m)**

**★ Reno/Sparks: 430,000**

**★ Las Vegas Metropolitan Area: 2 Million**



## Prescription Drug Demographics in Nevada\*, 2011-2017

	<b>Prescriptions for all Drugs</b>	<b>All Drugs (Pills Only)</b>	<b>Prescriptions for all Controlled Drugs</b>	<b>Controlled Drugs (Pills Only)</b>	<b>Opioids (Pills Only)</b>
Number of Prescribers	16,559	16,423	16,238	16,062	14,488
Number of Patients	2,462,989	2,294,847	2,320,083	2,168,180	1,852,679
Number of Pharmacies	1,558	1,511	1,452	1,438	1,244
Number of Prescriptions	29,856,708	28,340,615	28,050,379	26,940,099	14,316,422

GABAPENTIN 300 MG CAPSULE  
 AMOXICILLIN 500 MG CAPSULE  
 AMLODIPINE BESYLATE 5 MG TAB  
 IBUPROFEN 800 MG TABLET  
 AMLODIPINE BESYLATE 10 MG TAB  
 CYCLOBENZAPRINE 10 MG TABLET  
 TAMSULOSIN HCL 0.4 MG CAPSULE  
 FUROSEMIDE 20 MG TABLET  
 CIPROFLOXACIN HCL 500 MG TAB  
 LOSARTAN POTASSIUM 100 MG TAB  
 LEVOTHYROXINE 50 MCG TABLET  
 SERTRALINE HCL 100 MG TABLET  
 SULFAMETHOXAZOLE-TMP DS TABLET  
 VENTOLIN HFA 90 MCG INHALER  
 TRAZODONE 50 MG TABLET  
 METOPROLOL TARTRATE 25 MG TAB  
 LEVOTHYROXINE 75 MCG TABLET  
 FUROSEMIDE 40 MG TABLET  
 GABAPENTIN 600 MG TABLET

## Prescriptions for all Controlled Drugs, Nevada Cases, 2011-2017

<b>Drug Type</b>	<b>Number of Prescriptions</b>	<b>Percent</b>
Opioid	14,177,566	52.63
Stimulant	2,191,565	8.13
Barbiturate/Benzodiazepine	7,078,947	26.28
Opioid Mix	14	0.00
Sedative/Sleeping Pill	3,492,007	12.96
<b>Total</b>	<b>26,940,099</b>	<b>100.00</b>

## Opioid Prescriptions: Pills Only, Nevada Cases, 2011-2017

<b>Opioid Type</b>	<b>Number of Prescriptions</b>	<b>Percent</b>
Hydrocodone	7,252,896	51.2
Oxycodone	4,153,771	29.3
Tramadol	1,030,000	7.3
Morphine	848,210	6
Methadone	348,104	2.5
Hydromorphone	191,400	1.4
Oxymorphone	119,220	0.8
Codeine	86,162	0.6
Buprenorphine	81,163	0.6
Tapentadol	51,764	0.4
Meperidine	12,796	0.1
Pentazocine	1,527	0
Opium	292	0
Levorphanol	262	0
Butorphanol	6	0
Missing System	7	0
Sub-Total	14,177,573	100
<b>Total</b>	<b>14,177,580</b>	<b>100</b>

## Number of Opioid Pill Prescriptions -Nevada January 2011- December 2017





# Removing Erroneous Entries

<b>MME Range**</b>	<b>Number of Prescriptions</b>	<b>Percent</b>
0-90 daily MMEs	12,439,784	87.70
91-181 daily MMEs	1,257,148	8.90
182-272 daily MMEs	311,853	2.20
273-363 daily MMEs	95,666	0.70
364- 454 daily MMEs	21,331	0.20
455-1000 daily MMEs	41,908	0.30
1001-2000 daily MMEs	2,764	0.00
More than 2000 daily MMEs	499	0.00
Sub-Total	14,170,953	100.00
Missing System	6,627	0.00
<b>Total</b>	<b>14,177,580</b>	<b>100.00</b>

# Removing Erroneous Entries

<b>Pill Range**</b>	<b>Number of Prescriptions</b>	<b>Percent</b>
31-40	1,082	50.02
41-50	409	18.91
50 or more	672	31.07
<b>Total</b>	<b>2,163</b>	<b>100.00</b>

<b>Opioid Type</b>	<b>Quantity</b>	<b>Day Supply</b>	<b>Number of Pills Per Day**</b>
Methadone	73,230,840	30	2,441,028
Opium	140,000	7	20,000
Hydrocodone	12,000	20	600
Hydrocodone	12,000	20	600
Hydrocodone	12,000	20	600

Can address Rx Diversion by focusing on:

1) Doctors

2) Patients

3) Pharmacies



Offenders / Victims

Patient  
 Doctor  
 Pharmacists

Location

Physician's office  
 Pharmacy

Guardian and Handlers

Patients → Family & Doctors & Law Enforcement  
 Doctor & Pharmacists → Regulatory agencies & Law Enforcement

Managers → Office personnel



# Identifying “Problem” Patients

## “High Risk” Patient Indicators

The following indicators are used to determine the frequency of patients at high risk of prescription misuse, addiction and overdose:

High Risk Indicator	Coefficient*
Patient has seen 5 or more doctors (within three months)	0.8
Patient has filled scripts at 5 or more pharmacies (within three months)	0.8
Patient is receiving more than 90 daily MME's	0.5
Patient has received an opioid, benzo, and SOMA (within 1 month)	0.9
Patient has received an opioid and a benzo (within 1 month)	0.7
Patient has paid cash for a script 90% or more of the time	0.5
Patient has paid for the same drug with both insurance and cash	0.8
Patient receiving over 7 months of scripts over the course of one year	0.6

\* As determined by the Nevada Board of Pharmacy

# Risk Indicator Thresholds

- ▶ The sum of these problem indicators is 5.6
- ▶ Of those patients with at least 1 indicator:

Total Patients	645,737
For patients to be in this Percentile	They need an indicator above:
90 (Top 10%)	1.9
95 (Top 5%)	2.1
99 (Top 1%)	2.7

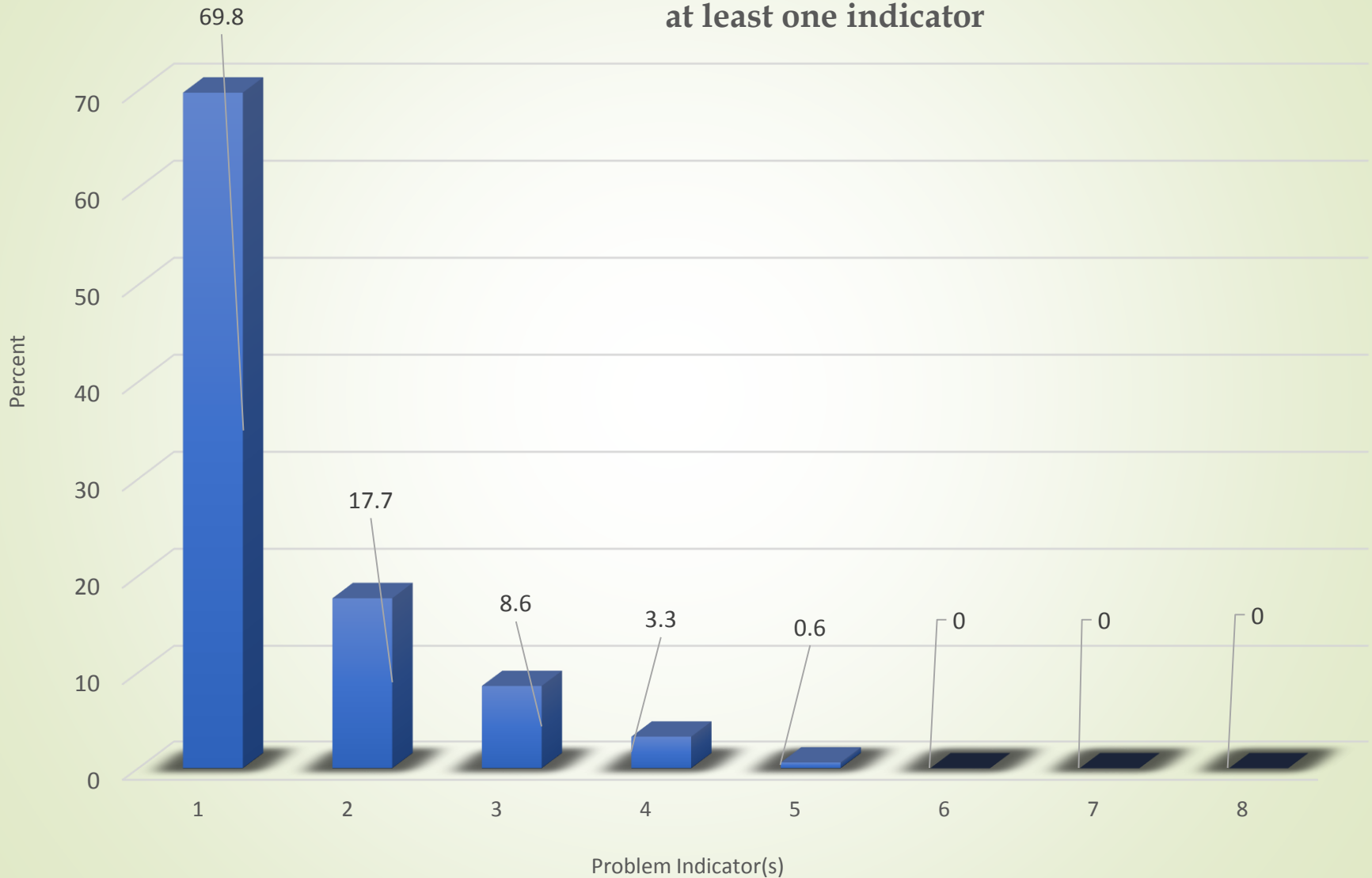
# Risk Indicators: Prevalence

Frequency among all patients in PMP between 2011-2017, who have filled an opioid pill prescription written by a Nevada prescriber, outliers removed: 1,851,206 patients total in PMP (outliers included: >2000 daily MMEs; >30 pills per day)

	Number of People	Percent
Patient has seen 5 or more doctors within a 90 day span	1,896	0.20%
Patient has filled scripts at 5 or more pharmacies	326	0.03%
Patient is receiving more than 90 daily MME's	229,940	24.17% #3
Patient has received an opioid, benzo, and SOMA	9,257	0.97%
Patient has received an opioid and a benzo	70,969	7.46%
Patient has paid cash for a script 90% or more of the time	245,261	25.78% #1
Patient has paid for the same drug with both insurance and cash	159,966	16.82%
Patient receiving over 7 months of scripts over the course of one year	233,649	24.56% #2
Total Number of Indications*	951,264	100%



# Percent of Patients with Risk Indicator, 2011-2017, Opioid Rx Pill only, Patients who have filled Rx written by Nevada Prescriber, Outliers removed. N= 645,737 Total patients who have at least one indicator



# Looking at 2017 Patients

Problem Indicator Score	Number of Patients	Percent
0.5	36,231	55.7
0.7	327	0.5
0.8	6,016	9.2
1	921	1.4
1.1	2,775	4.3
1.2	67	0.1
1.3	1,244	1.9
1.3	901	1.4
1.4	3,490	5.4
1.5	80	0.1
1.6	48	0.1
1.7	1	0
1.8	709	1.1
1.9	26	0
1.9	1,826	2.8
2	25	0
2.1	812	1.2
2.2	102	0.2
2.3	3	0
2.4	7	0
2.6	4	0
2.6	930	1.4
2.7	119	0.2
2.9	6	0
3	103	0.2
3.1	2	0
3.2	1	0
3.4	4	0
3.5	155	0.2
4	1	0
4.2	1	0
4.3	2	0
Total	65,071	100

Total Patients in 2017 with an Indicator	65,071
Percentiles	Problem Indicator Score
90	1.4
95	1.9
<b>99</b>	<b>2.6</b>

In 2017 - top 1% =  
1,328 patients

# Top patients with high total pill quantity

Median = 54    Mean = 603

<b>Patient</b>	<b>Total Number of Pills</b>	<b>Total Number of Prescriptions</b>
91f22610-927a-11e6-9ab4-06a21323247b	83,820	248
63650c80-9140-11e6-9ab4-06a21323247b	80,294	254
6c650780-91b4-11e6-9ab4-06a21323247b	68,510	181
c13a4050-9145-11e6-9ab4-06a21323247b	63,040	315
1fc2e410-90e7-11e6-9ab4-06a21323247b	62,734	180
542c4790-912e-11e6-9ab4-06a21323247b	61,698	337
3719aea1-9150-11e6-9ab4-06a21323247b	61,460	114
dd62a2b0-9157-11e6-9ab4-06a21323247b	61,433	289
c8a8f750-7713-11e7-951a-024228cca67d	59,947	258
6b6102a0-9180-11e6-9ab4-06a21323247b	59,400	158
d1668a00-9178-11e6-9ab4-06a21323247b	59,040	217
2b1ca1d0-9140-11e6-9ab4-06a21323247b	58,658	360
22925520-9152-11e6-9ab4-06a21323247b	58,240	251
68719130-913b-11e6-9ab4-06a21323247b	56,692	142
c10841e0-9258-11e6-9ab4-06a21323247b	55,436	241
6db7aad0-90e6-11e6-9ab4-06a21323247b	53,775	215
b914f220-9277-11e6-9ab4-06a21323247b	53,704	174
01c9ed20-90e5-11e6-9ab4-06a21323247b	53,652	224
126af330-917c-11e6-9ab4-06a21323247b	53,590	267
0edf8bb0-913e-11e6-9ab4-06a21323247b	52,320	304

# Patient Snapshot

Gender: Female

Age: 65

City: Dayton

Prescribers: 11

Prescriber Offices: 9

Dispensaries: 5

Number of Rx: 463

Total Pill Count: 15,317

Hydrocodone: 3

Hydromorphone: 1

Methadone: 2

Morphine: 224

Oxycodone: 232

Tramadol: 1

Daily MME: Mean=105

Median=90

Pill Quantity: Mean=33 pills

Median=21 pills



Problem Indicator score: 1.9 (3 Indicators)

Patient is receiving more than 90 daily MME's

Patient has paid for the same drug with both insurance and cash

Patient receiving over 7 months of scripts over the course of one year

Paid cash 5.4% of the time



patient_ad	patient_ci	patient_ge	drug_name	quantity	days_suppl	daily_mme	prescrib_a	prescrib_b	dispensary	dispensa_a	dispensa_b	patient_ag	date_writt	date		
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	200	25	360.00	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	51	19-Jan-2016	11
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	200	25	360.00	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	51	16-Feb-2016	13
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	200	25	360.00	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	51	15-Mar-2016	13
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	22	368.18	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	52	12-Apr-2016	13
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	22	368.18	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	0	12-Apr-2016	13
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	22	368.18	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	52	10-May-2016	13
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	22	368.18	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	52	07-Jun-2016	13
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	25	324.00	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	52	06-Jul-2016	13
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	22	368.18	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	52	02-Aug-2016	13
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	22	368.18	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	52	30-Aug-2016	31
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	23	352.17	3233 W			LAS VEGAS		2200 HARVARD WAY	RENO	52	28-Sep-2016	05
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	22	368.18	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	52	08-Nov-2016	30
00 WHEELER AVE	RENO	female	OXYCODONE HCL 30 MG TABLET	180	22	368.18	3233 W			LAS VEGAS		10370 N MCCARRAN BLVD	RENO	52	22-Nov-2016	28

Problem Indicator: 2.6  
Total Pill Count:10,630

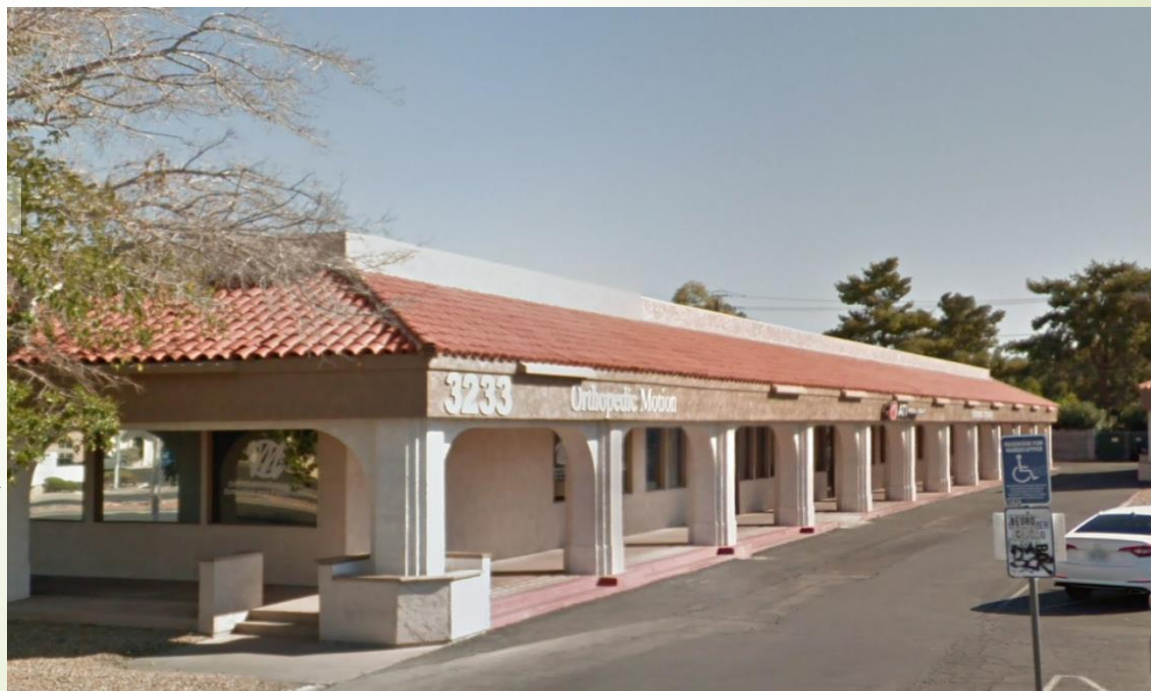
Patient is receiving more than 90 daily MME's

Patient has received an opioid and a benzo (within 1 month)

Patient has paid for the same drug with both insurance and cash

Patient receiving over 7 months of scripts over the course of one year

Paid in cash 7.78% of the time



# Identifying “Problem” Prescribers

## CDC GUIDELINE FOR PRESCRIBING OPIOIDS FOR CHRONIC PAIN, 2016

- *“When opioids are started, clinicians should prescribe the lowest effective dosage. **Clinicians should use caution** when prescribing opioids at any dosage, should carefully reassess evidence of individual benefits and risks when considering increasing dosage to  $\geq 50$  morphine milligram equivalents (MME)/day, and **should avoid increasing dosage to  $\geq 90$  MME/day** or carefully justify a decision to titrate dosage to  $\geq 90$  MME/day. “*

# Context: Nevada Prescribers

Percentage of Opioid Prescriptions \*(N= 14,488 Prescribers) Mean= 64.75 percent.  
Median= 73.00 percent, 2011-2017

Percentage of Opioid Rx	Number of Prescribers	Percent
0-40%	3,652	25.20
41-73%	3,674	25.40
74-93%	3,600	24.80
94+%	3,562	24.60
<b>Total</b>	<b>14,488</b>	<b>100.00</b>

\* Prescribers who have prescribed at least one Opioid pill prescription

Top MME Prescribers. (N= 214 prescribers in 1001-2000 Daily MME grouping) \*  
Mean= 11,742.58 total daily MMEs, Median= 2,160.00 total daily MMEs, 2011-2017

Prescriber*	Total Daily MMEs Prescribed	Number of Prescriptions	Average Daily MMEs
BK0	158,605	120	1,322
AT7	150,582	137	1,099
MO1	146,310	115	1,272
BS5	144,111	93	1,550
BM2	138,573	94	1,474
BM3	135,335	103	1,314
AG2	116,961	92	1,271
FM2	101,631	65	1,564
BR7	72,451	59	1,228
MH0	58,050	43	1,350

\*De-identified prescriber DEA number

\*\*Out of the 14,488 Nevada Prescribers who have prescribed at least one opioid pill prescription in the research time from (2011-2017), 214 prescribers have opioid prescriptions in the 1001-2000 daily MME range grouping.



# Context: Nevada Prescribers 2011-2017

Mean = 1,618 total pills  
Median= 180 total pills

Prescriber*	Total Pills Prescribed	Number of Prescriptions	Average Number of Pills by Prescription
BG7	111,668	176	634.48
BJ8	81,680	136	600.59
AT7	69,011	199	346.79
BM3	63,980	165	387.76
AG2	62,506	149	419.5
BK0	54,939	79	695.43
BS1	37,780	111	340.36
MO1	32,546	56	581.18
MG3	31,278	46	679.96
BB5	<b>30,680</b>	82	374.15

\*De-identified prescriber DEA number

## Nevada Prescribers (N= 14,484 prescribers)

Number of Prescriptions  
 Mean= 977.69 prescriptions  
 Median= 80.00 prescriptions

Number of Patients  
 Mean= 328.44 patients  
 Median= 51.00 patients

<b>Prescriber *</b>	<b>Number of Prescriptions</b>
MP0	86,469
BB4	56,818
BV9	55,506
MR2	55,107
BH2	54,716
BT8	51,891
MD0	51,021
MA0	48,311
BS5	47,188
BL8	47,010

<b>Prescriber *</b>	<b>Number of Patients</b>
AS0	21,705
BS2	11,784
FL0	11,382
BC9	9,875
BM3	8,998
BG3	8,747
BS5	8,368
AV4	7,904
AT6	7,231
FH4	6,862

*\*De-identified prescriber DEA number*

## Prescribing Behavior for BG7, Opioid Pill Prescriptions

Opioid Type	Number of Prescriptions	Number of Pills	Percent
Buprenorphine	57	1,213	0.60
Codeine	14	930	0.20
Hydrocodone	4,260	393,456	45.90
Hydromorphone	165	16,016	1.80
Meperidine	1	30	0.00
Methadone	457	172,085	4.90
Morphine	570	42,818	6.10
Oxycodone	2,549	276,847	27.50
Oxymorphone	68	4,325	0.70
Pentazocine	3	900	0.00
Tapentadol	4	240	0.00
Tramadol	1,129	105,277	12.20
<b>Total</b>	<b>9,277</b>	<b>1,014,137</b>	<b>100.00</b>



### Prescriber *BG7*

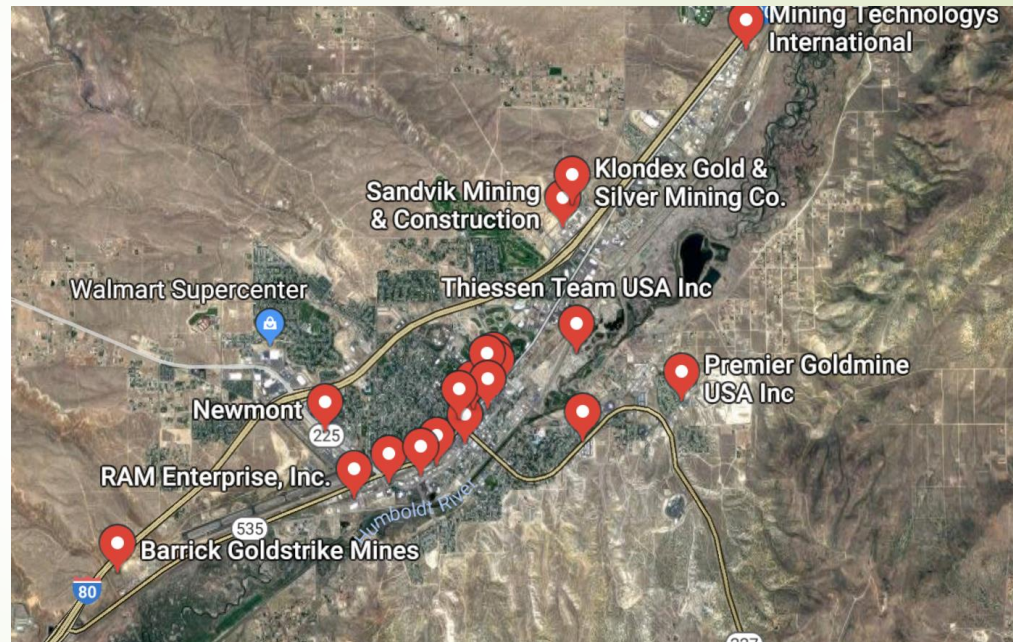
Number of Prescriptions	9,277
Number of Patients	762
Number of Pills Prescribed	1,014,137
Daily MMEs:	
<i>Mean</i>	68.63
<i>Median</i>	33.33
Pill Quantity:	
<i>Mean</i>	109.32
<i>Median</i>	90.00

# Case Study of Location: Elko, NV

(N=208 Elko Prescribers) 32,713 patients

157,849 Rx (1.11% of Nevada Prescriptions)

Patient City	Number of Rx	Percent
Elko	84,909	53.80
Spring Creek	46,669	29.60
Other	5,133	3.30
Battle Mountain	4,980	3.20
Carlin	4,719	3.00
Winnemucca	2,400	1.50
Las Vegas	2,298	1.50
Wells	1,508	1.00
Crescent Valley	1,030	0.70
Reno	773	0.50
Ely	678	0.40
Verdi	591	0.40
Sparks	360	0.20
Eureka	228	0.10



# Case Study of Location: Elko, NV

208 Elko Prescribers

32,713 patients

157,849 Rx (1.11% of Nevada Prescriptions)

<b>Opioid Type</b>	<b>Number of Prescriptions</b>	<b>Percentage</b>
Hydrocodone	91,350	57.90
Oxycodone	43,108	27.30
Tramadol	13,625	8.60
Morphine	4,477	2.80
Methadone	1,507	1.00
Hydromorphone	1,182	0.70
Codeine	885	0.60
Buprenorphine	581	0.40
Tapentadol	540	0.30
Oxymorphone	366	0.20
Meperidine	226	0.10
Opium	1	0.00
Pentazocine	1	0.00
<b>Total</b>	<b>157,849</b>	<b>100.00</b>

# Case Study of Location: Elko, NV

208 Prescribers 32,713 patients

Mean= 316 patients  
Median= 78 patients

Mean = 43,396 total pills prescribed, Median= 4,175 total pills prescribed  
Mean = 759 total prescriptions, Median= 129 total prescriptions

Prescriber	Number of Patients
AS3 (Regional Hospital)	4,498
BJ4 (ER Medicine)	4,052
AC3 (Regional Hospital)	3,690
MW1 (Regional Hospital)	3,102
BK3	2,492
MV2	2,091
FG2 (Regional Hospital)	1,844
BM4	1,667
FO3	1,322
MM1	1,241
MH3 (Regional Hospital)	1,142
BP5	1,082
BP6	962
FL1	942
AB2	918
FW3	894
FG3	841
BC8	838
FCO	828

Prescriber*	Total Pills Prescribed	Number of Prescriptions
BP6 (D.D.S.)	858,541	10,589
MCO	687,963	6,724
FG1 (Regional Hospital)	656,116	4,349
MP1	480,686	4,723
FG3	431,784	4,748
AN2	344,524	4,612
BM4	273,826	5,182
FS2 (Regional Hospital)	238,759	2,502
BB3	237,704	4,140
BW8 (Regional Hospital)	225,088	3,037
AH2 (Regional Hospital)	214,056	2,226
BD8	191,128	2,109
MR2 (Regional Hospital)	188,039	1,720
MH1 (Regional Hospital)	183,708	2,297
BL6 (Regional Hospital)	179,541	2,223
MA1	147,254	2,546
BA5	143,432	1,713
FG3	140,276	1,314
MM1 (podiatric medicine)	135,801	2,922
FM3	128,104	1,480

# Elko, NV

## Top 20 patients (2011-2017)

Patient	Prescriber	Age	Opioid Type	Total Number of Pills	Total Number of Rx
1	MP1	45-54	Oxycodone	16,410	152
2	BB3	55-64	Oxycodone	16,091	191
3	BP6	55-64	Oxycodone	14,161	82
4	MP1	45-54	Oxycodone	13,470	75
5	MB0	75+	Oxycodone	13,259	78
6	AN2	65-74	Hydrocodone	12,732	55
7	MK1	65-74	Oxycodone	12,565	157
8	FD0	45-54	Morphine	11,850	70
9	AH2	75+	Hydrocodone	11,820	63
10	FG1	45-54	Methadone	11,760	25
11	BH6	55-64	Hydrocodone	10,510	80
12	BL6	45-54	Hydrocodone	10,230	59
13	MP1	45-54	Hydrocodone	10,220	69
14	BL6	75+	Hydrocodone	10,140	73
15	AN2	45-54	Oxycodone	10,030	174
16	MH1	55-64	Oxycodone	10,020	134
17	AN2	65-74	Oxycodone	9,960	92
18	MP1	45-54	Hydrocodone	9,900	72
19	AN2	55-64	Oxycodone	9,785	76
20	BH6	75+	Hydrocodone	9,510	75

# Heroin Connection

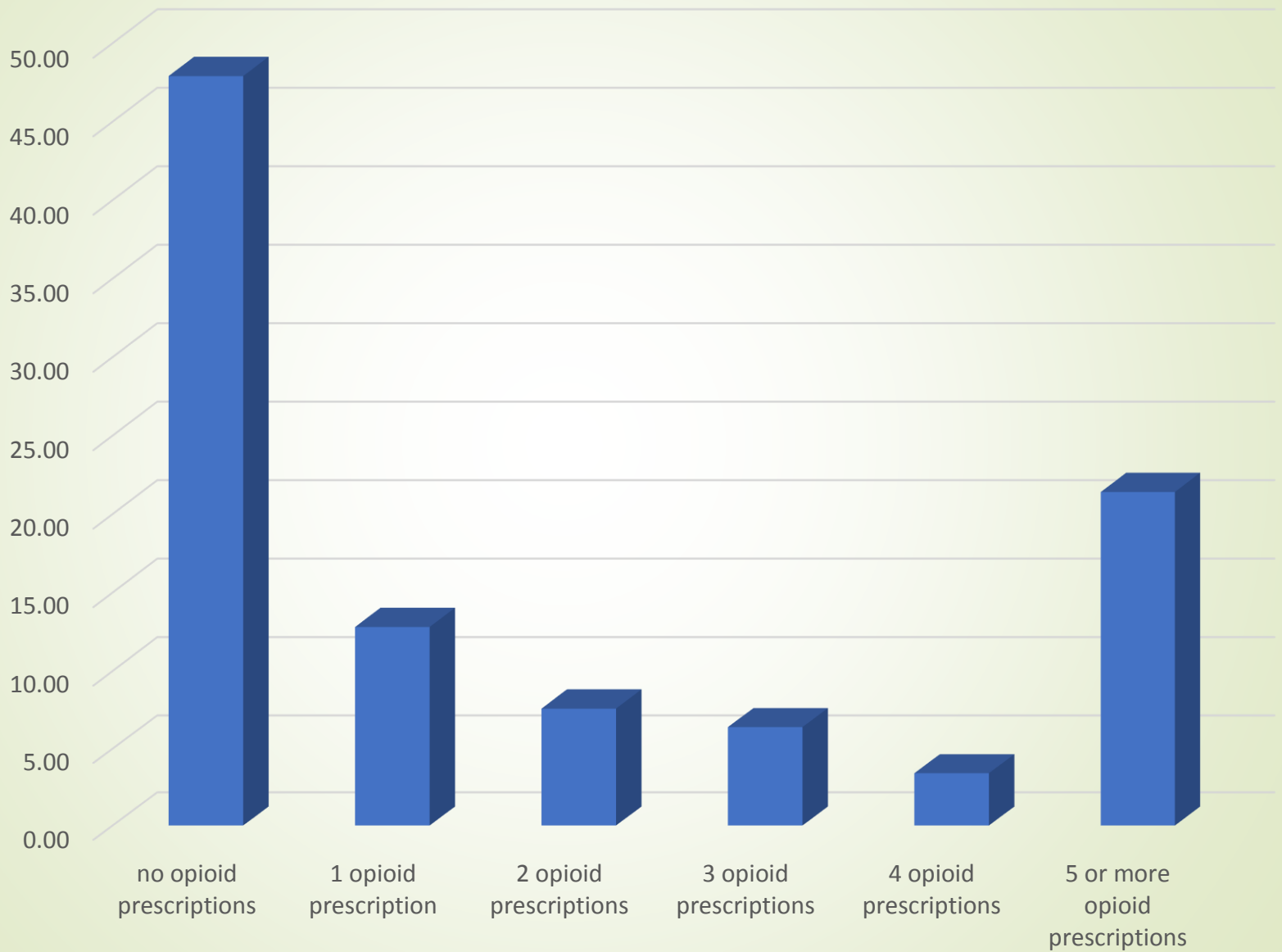




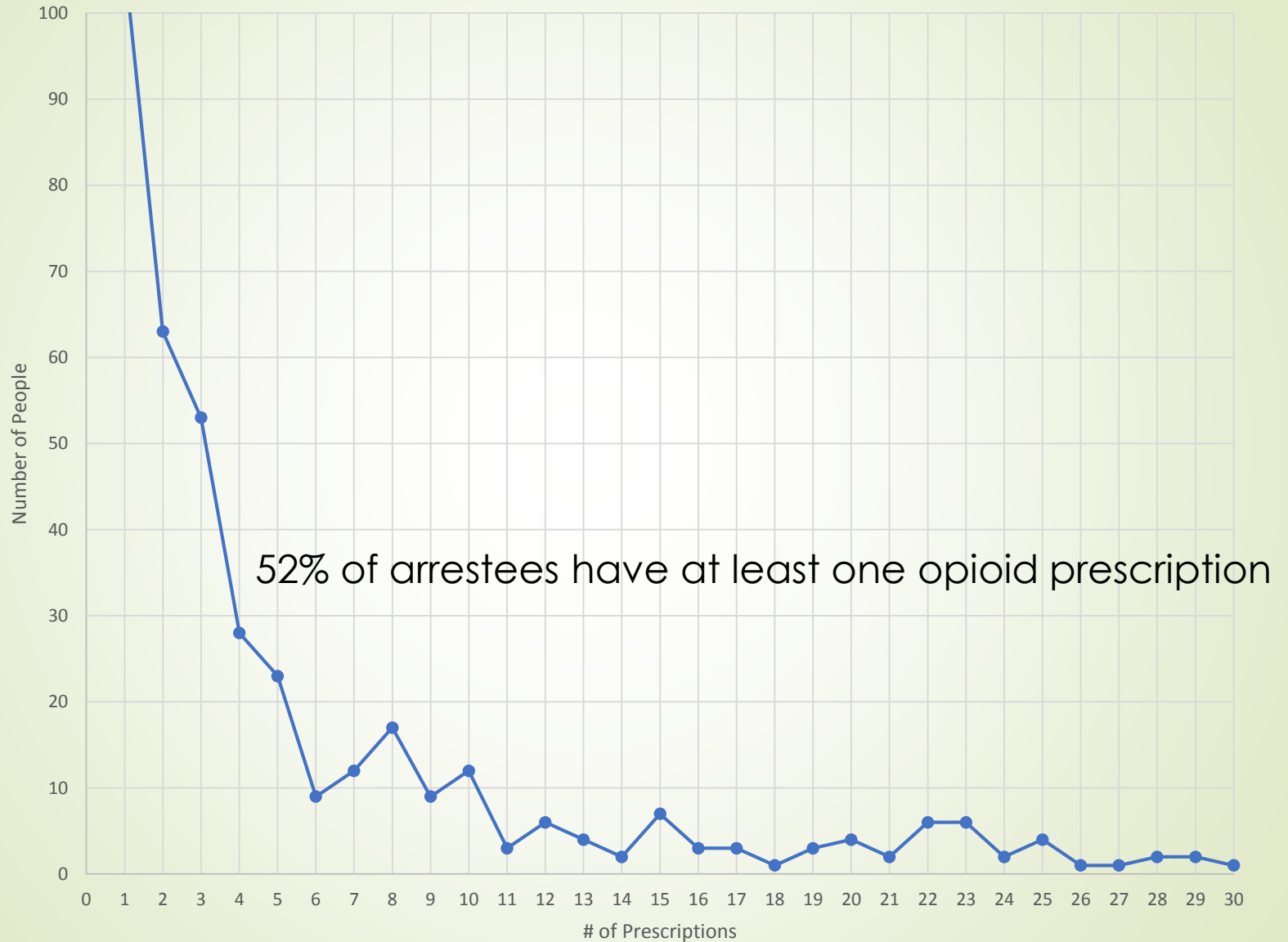
# Heroin arrestee data

- ▶ Individuals arrested by Reno P.D. and the Washoe County Sheriff's Office for heroin related charges between 2011 and the first part of February 2017
- ▶ Number of cases: 826
- ▶ Queried individuals' Nevada PMP histories, then de-identified for analysis
- ▶ Goals: determine how frequently prescription opioid use co-occurs with heroin use, and whether there appears to be any linear progression between the two
  - ▶ Are there any commonalities in these cases, which present as opportunities for intervention?
- ▶ According to PMP data, **52%** of these individuals had at least one opioid prescription filled during the 2011-first part of February 2017 time period.

# Of those arrested for heroin, % of people with...

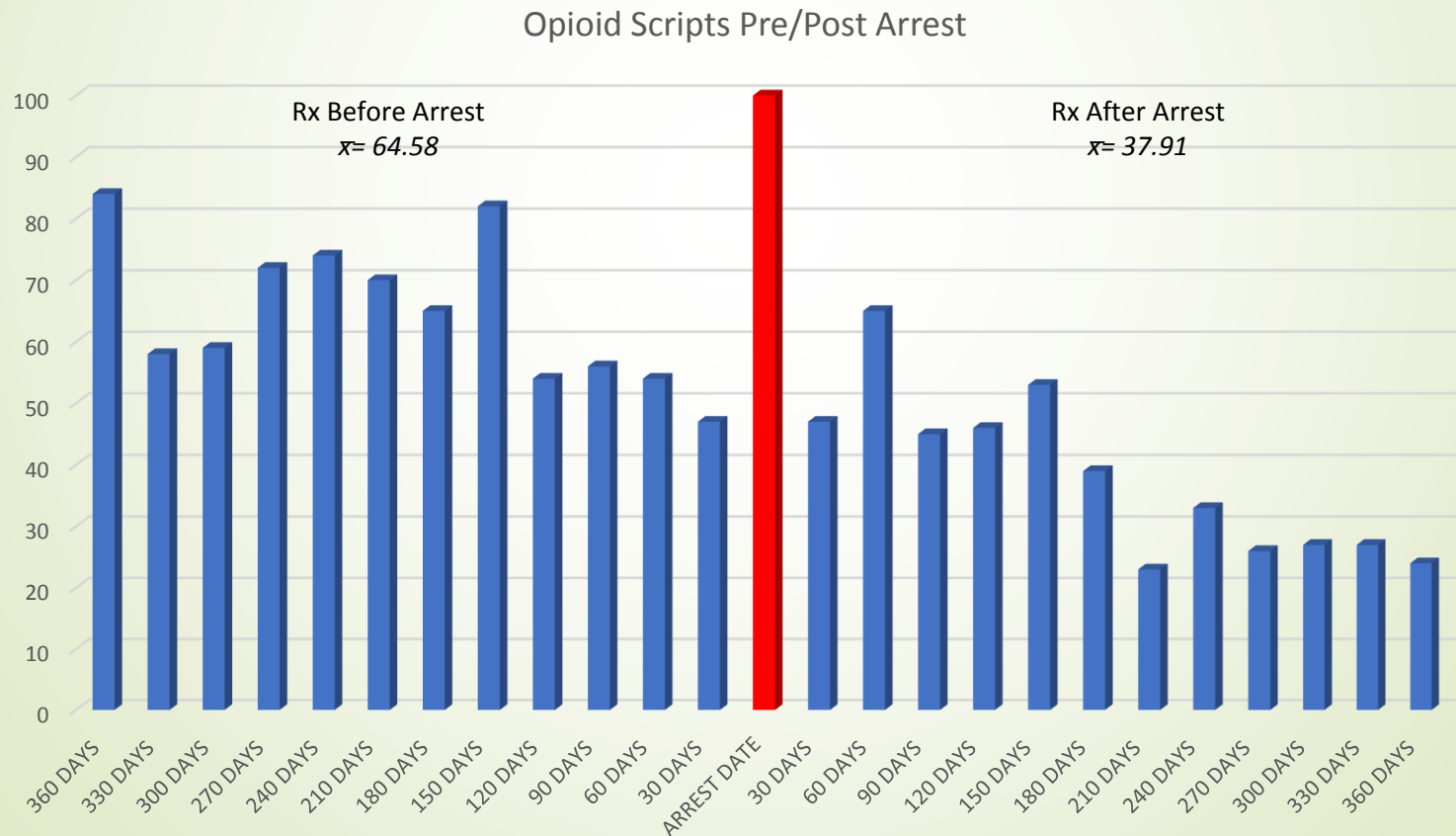


# Number of Opioid Scripts per Heroin Arrestee



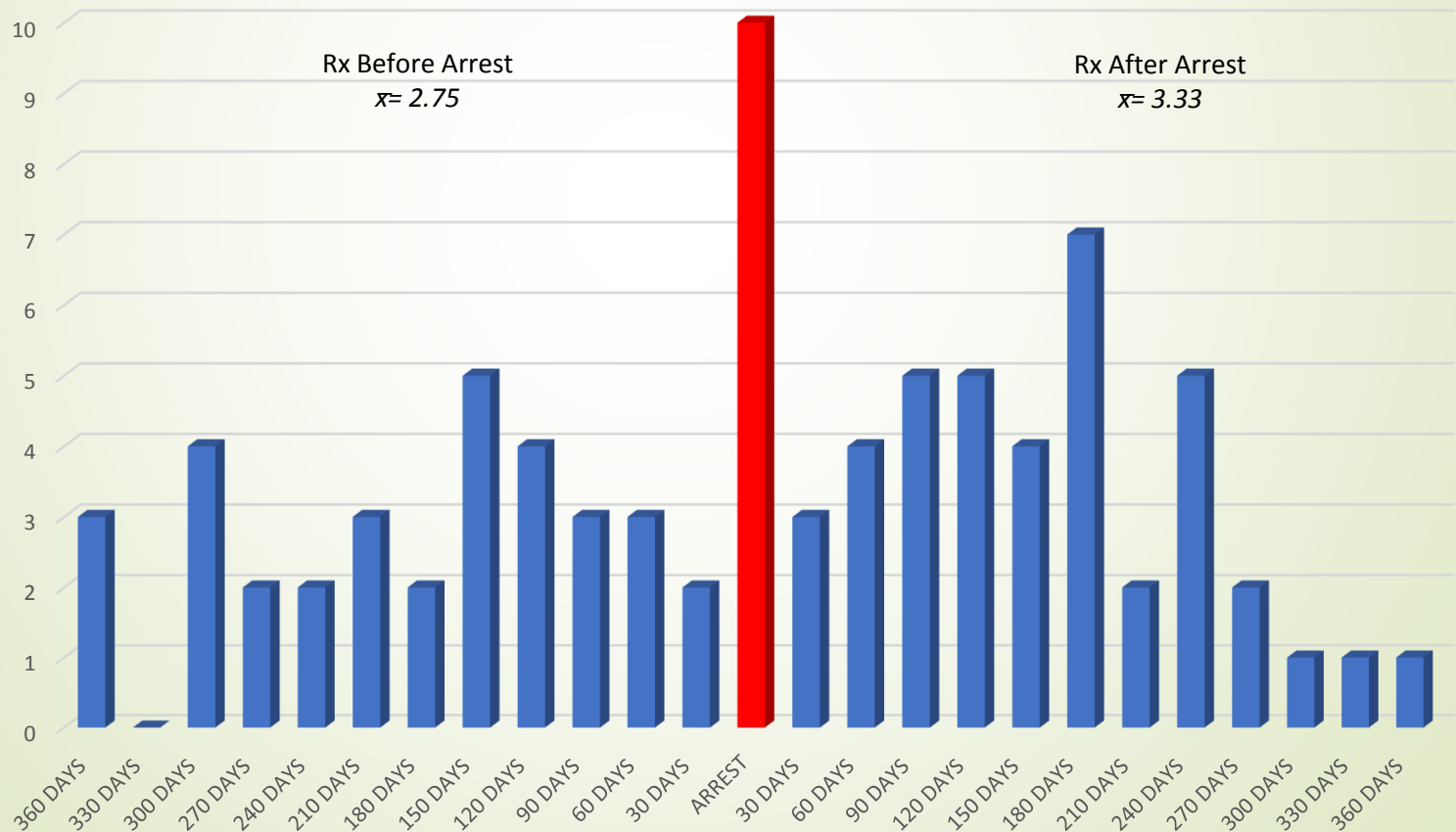
# Rx Opioids to Heroin Arrestees

- Surprisingly, data showed that a large number of opioids were prescribed even after the individual was arrested for heroin:

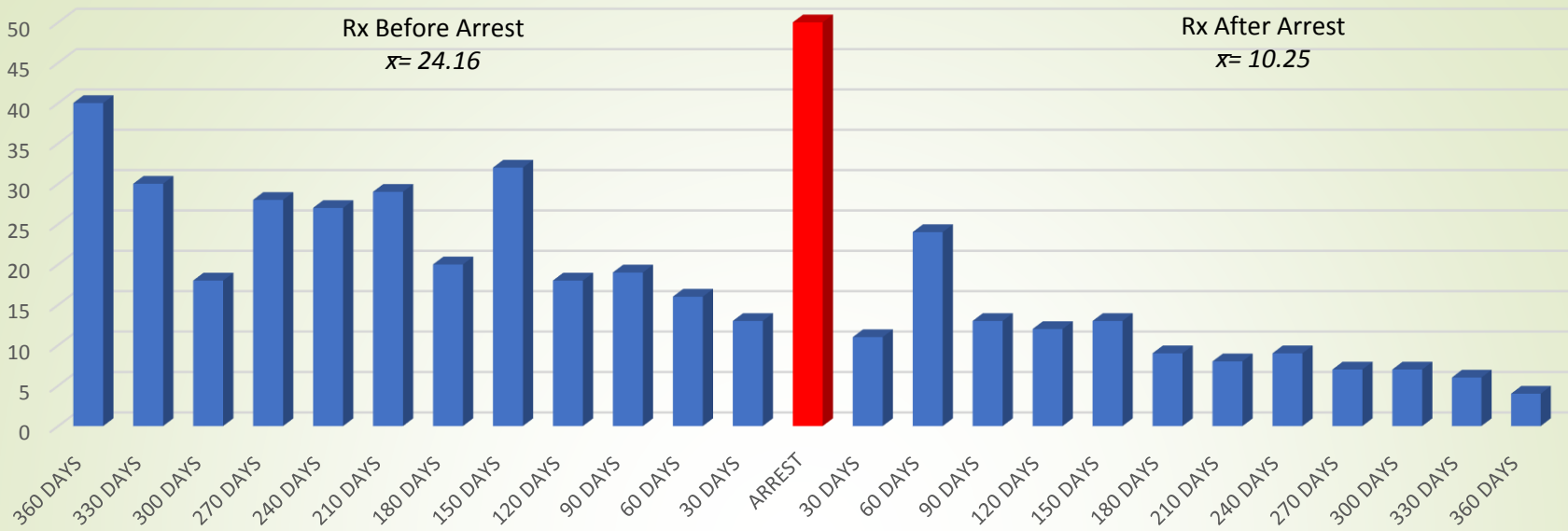


The incidence of prescriptions filled before vs. after heroin arrest varied by drug type. Morphine prescriptions were found to be more common after arrest among this population.

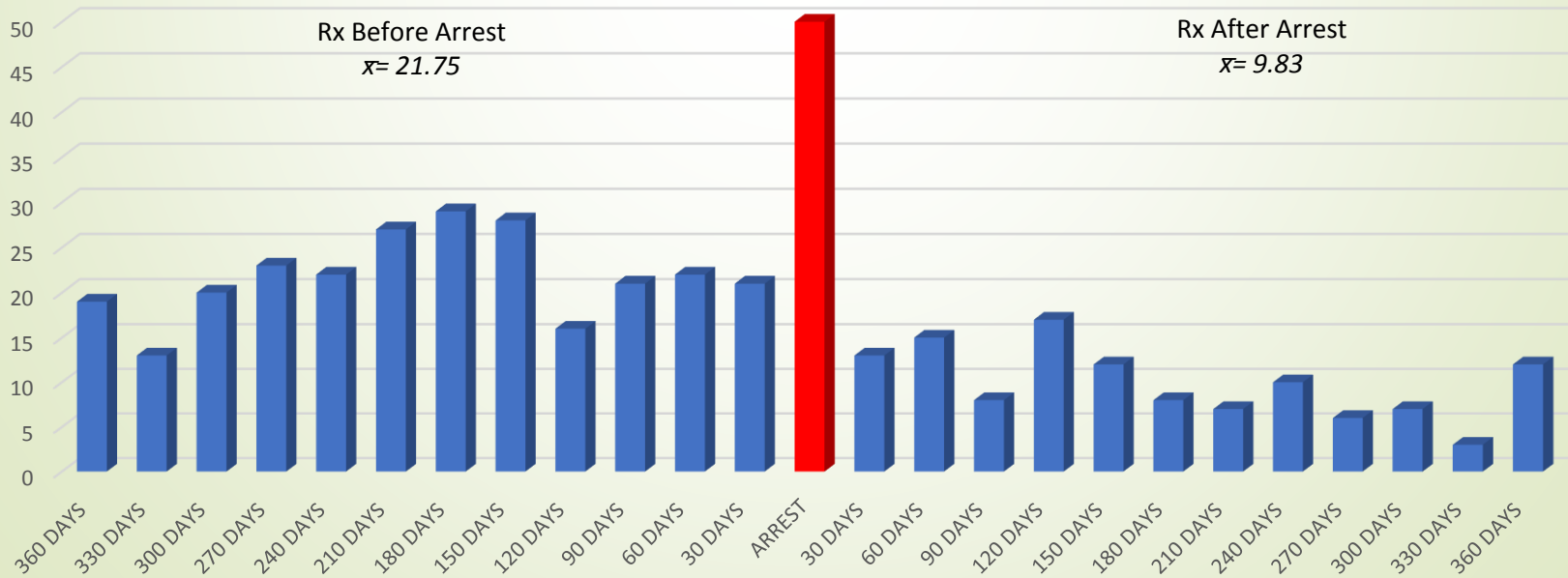
Morphine Scripts Pre/Post Arrest



### Oxycodone Scripts Pre/Post Arrest



### Hydrocodone Scripts Pre/Post Arrest

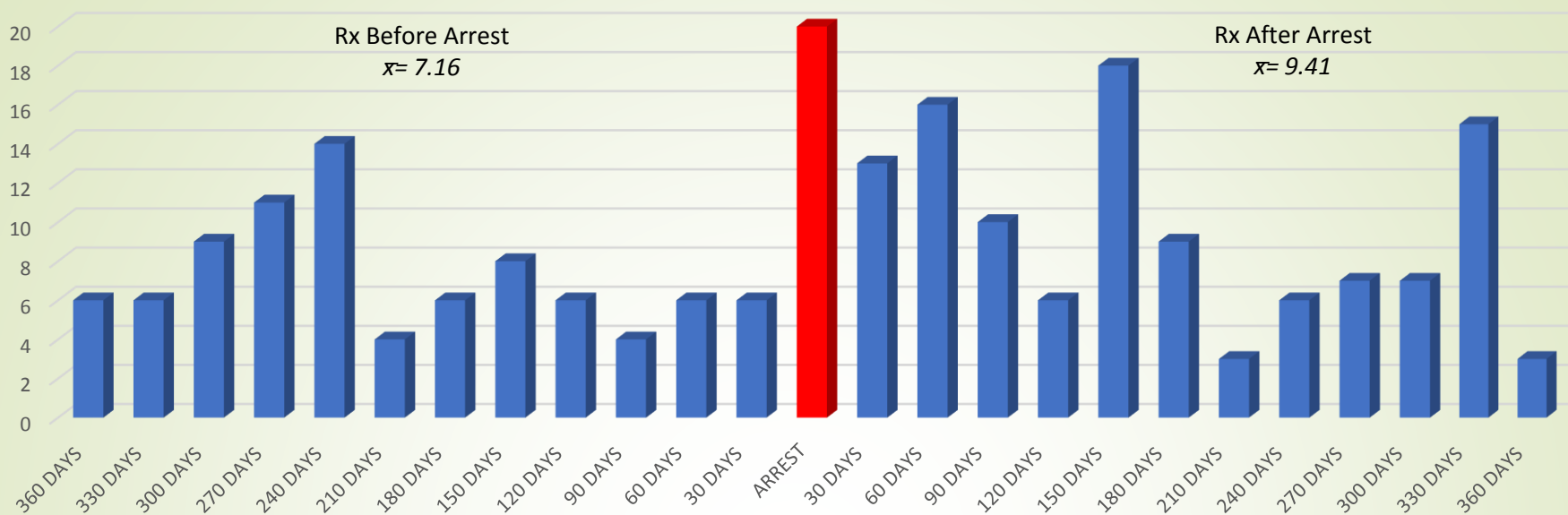


Reno Police Department

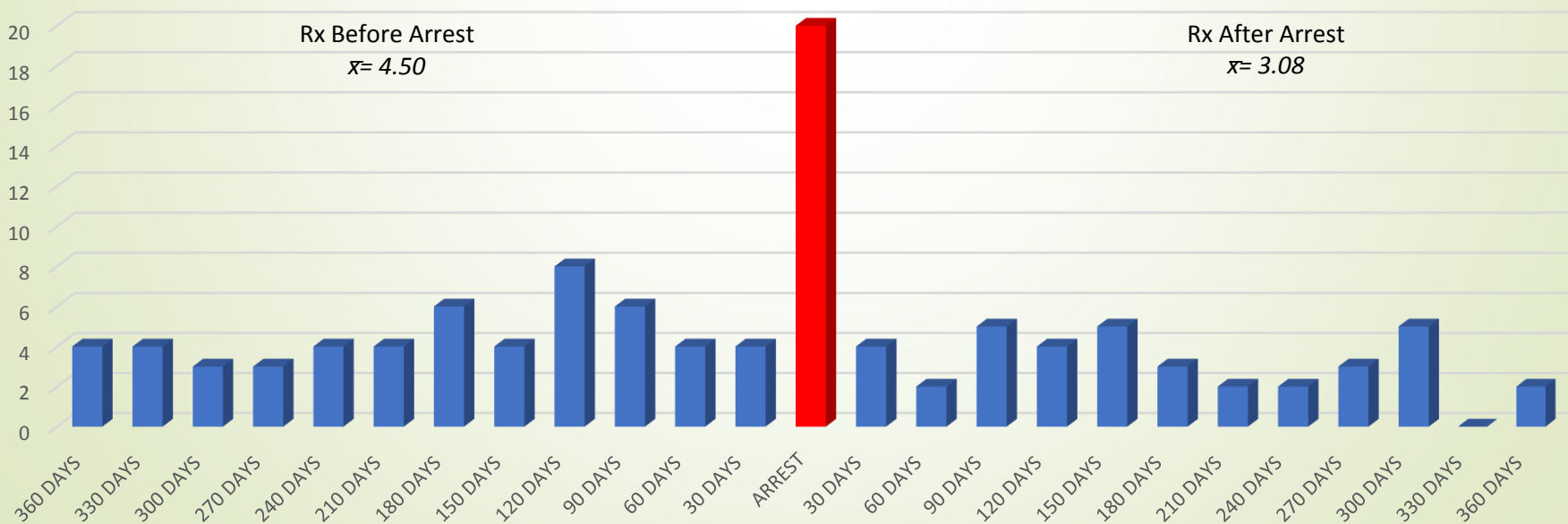
Nevada State Board of Pharmacy

University of Nevada, Reno

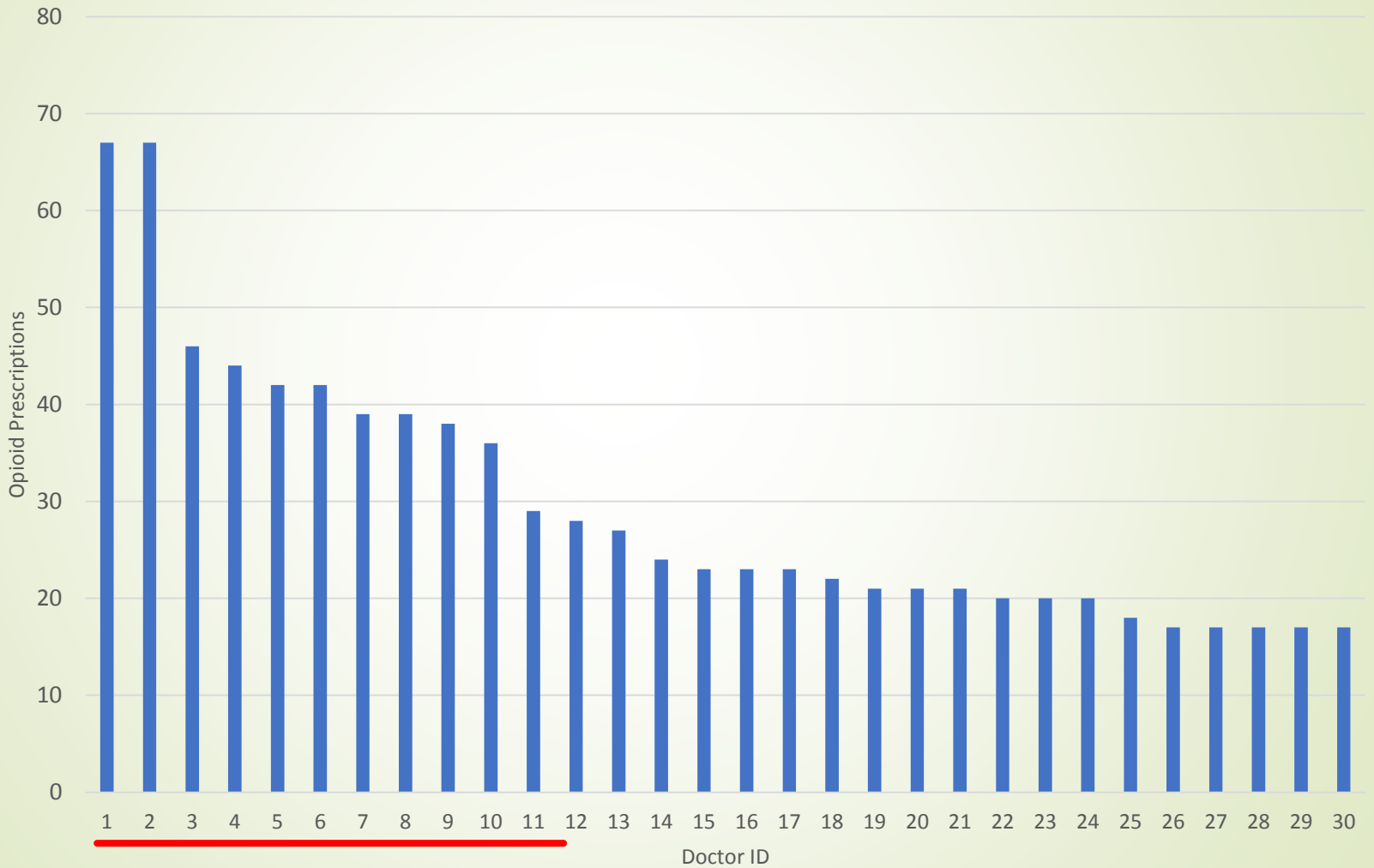
## Buprenorphine Scripts Pre/Post Arrest



## Methodone Scripts Pre/Post Arrest

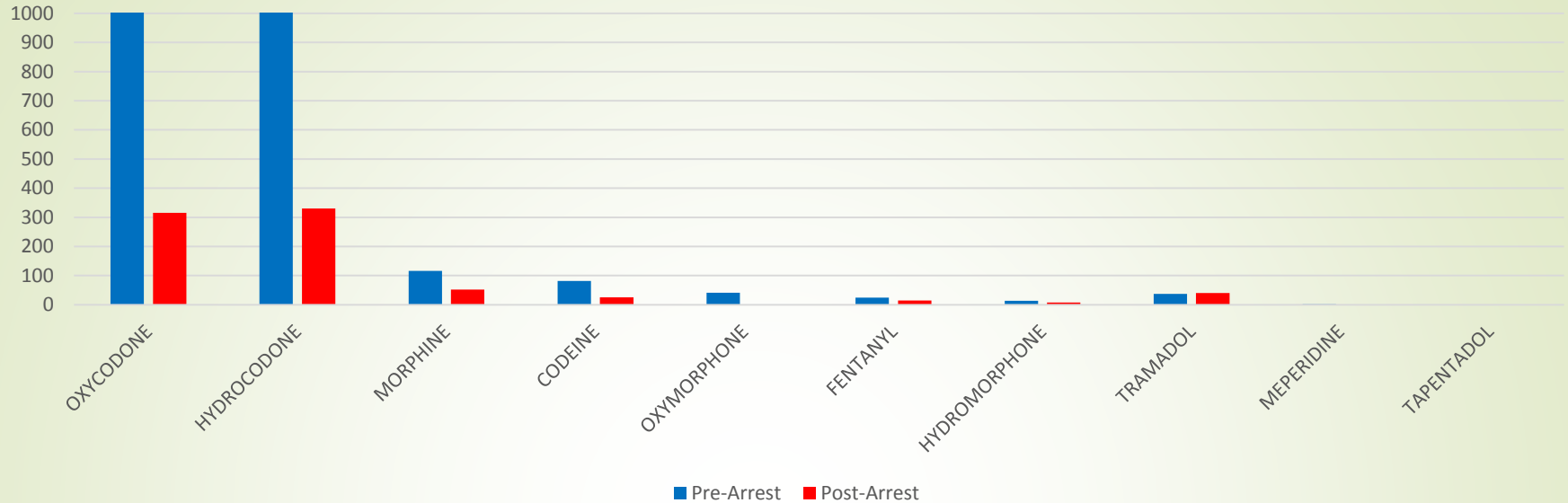


# Opioid Prescriptions Written to People Arrested for Heroin 2011-2017





## Frequency of Opioids Before and After Arrest



### Opioid Frequency Pre Arrest

	Number of Prescriptions	Percent
Oxycodone	1,115	44.11%
Hydrocodone	1,114	43.40%
Morphine	168	4.60%
Codeine	89	3.21%
Oxymorphone	65	1.63%
Fentanyl	60	.95%
Hydromorphone	35	.52%
Tramadol	30	1.47%
Meperidine	2	0.04%
Tapentadol	1	0.04%
<b>Total</b>	<b>2,679</b>	<b>100%</b>

### Opioid Frequency Post Arrest

	Number of Prescriptions	Percent
Oxycodone	358	40.18%
Hydrocodone	389	42.09%
Morphine	106	6.63%
Codeine	26	3.19%
Oxymorphone	1	0.13%
Fentanyl	0	1.79%
Hydromorphone	15	.89%
Tramadol	37	5.10%
Meperidine	0	0.0%
Tapentadol	0	0.0%
<b>Total</b>	<b>932</b>	<b>100.0%</b>

# Case Studies

# Patient 1: White Male

Opioid Rx (26)

Benzodiazepine Rx (9)

Sedative Rx (2)

Arrests (2)

Prescribers (11)

Dispensers (10)

Total Pill count: 4,148

RxFillDate	Drug Name	Prescriber	Quantity	Days
14-Jan-11	OXYCONTIN 80 MG TABLET	1	10	2
21-Jan-11	OXYCODONE HCL 30 MG TABLET	1	120	20
21-Jan-11	ALPRAZOLAM 2 MG TABLET	1	90	30
4-Mar-11	OXYCONTIN 80 MG TABLET	2	35	6
11-Mar-11	OXYCODONE HCL CR 40 MG TABLET	2	100	20
20-Mar-11	OXYCONTIN 40 MG TABLET	3	20	2
21-Mar-11	OXYCONTIN 80 MG TABLET	2	10	2
23-Mar-11	FENTANYL 75 MCG/HR PATCH	4	10	30
25-Mar-11	OXYCONTIN 40 MG TABLET	2	210	35
26-Mar-11	ALPRAZOLAM 2 MG TABLET	2	150	30
15-Apr-11	ALPRAZOLAM 2 MG TABLET	5	28	7
25-Apr-11	ALPRAZOLAM 2 MG TABLET	2	150	30
23-May-11	ALPRAZOLAM 2 MG TABLET	2	150	30
21-Jun-11	ALPRAZOLAM 2 MG TABLET	6	150	30
21-Jun-11	ZOLPIDEM TART ER 12.5 MG TAB	6	30	30
18-Aug-11	SUBOXONE 8 MG-2 MG SL FILM	7	120	30
29-Aug-11	ALPRAZOLAM 2 MG TABLET	8	90	30
29-Aug-11	ZOLPIDEM TART ER 12.5 MG TAB	6	30	30
16-Jul-13	OXYCODONE HCL 10 MG TABLET	9	120	30
30-Jul-13	OXYCODONE HCL 20 MG TABLET	9	200	17
3-Sep-13	OXYCODONE HCL 20 MG TABLET	9	200	30
5-Mar-14	OXYCODONE HCL 20 MG TABLET	9	200	30
26-Mar-14	OXYCODONE HCL 20 MG TABLET	9	200	17
22-Apr-14	OXYCODONE HCL 30 MG TABLET	10	150	25
20-May-14	OXYCODONE HCL 30 MG TABLET	10	150	25
16-Jun-14	OXYCODONE HCL 30 MG TABLET	10	150	30
14-Jul-14	OXYCODONE HCL 30 MG TABLET	10	150	30
22-Aug-14	OXYCODONE HCL 30 MG TABLET	10	150	25
16-Oct-14	OXYCODONE HCL 30 MG TABLET	10	150	30
13-Nov-14	OXYCODONE HCL 30 MG TABLET	10	150	30
10-Dec-14	OXYCODONE HCL 30 MG TABLET	10	150	30
6-Feb-15	OXYCODONE HCL 30 MG TABLET	10	150	30
1-Apr-15	OXYCODONE HCL 30 MG TABLET	10	150	30
1-Apr-15	ALPRAZOLAM 0.5 MG TABLET	10	15	8
29-Apr-15	OXYCODONE HCL 5 MG TABLET	10	60	30
29-Apr-15	OXYCODONE HCL 30 MG TABLET	10	120	30
2-Dec-15	ALPRAZOLAM 0.25 MG TABLET	11	30	30



8 prescribers  
in 8 months

1<sup>st</sup> heroin arrest: Sept 2011  
Age: 38



Regular  
intervals,  $\leq 1$   
Rx/month

2<sup>nd</sup> heroin arrest: June  
2015  
Age: 41

RxWrittenDate	RxFillDate	Drug Name	Prescriber	Quantity	Days
20-Jan-11	20-Jan-11	MORPHINE SULF CR 30 MG TABLET	1	90	30
20-Jan-11	20-Jan-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
15-Feb-11	16-Feb-11	MORPHINE SULF CR 30 MG TABLET	1	90	30
16-Feb-11	16-Feb-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
10-Mar-11	11-Mar-11	MORPHINE SULF CR 30 MG TABLET	1	90	30
10-Mar-11	11-Mar-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
5-Apr-11	7-Apr-11	MORPHINE SULF ER 30 MG TABLET	1	90	30
5-Apr-11	7-Apr-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
20-Apr-11	20-Apr-11	HYDROMORPHONE 2 MG TABLET	1	84	14
2-May-11	3-May-11	MORPHINE SULF ER 30 MG TABLET	1	90	30
2-May-11	3-May-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
27-May-11	30-May-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
18-May-11	17-Jun-11	ALPRAZOLAM 1 MG TABLET	1	60	30
18-May-11	17-Jun-11	CARISOPRODOL 350 MG TABLET	1	90	30
18-May-11	27-Jun-11	CARISOPRODOL 350 MG TABLET	1	90	30
28-Jun-11	28-Jun-11	OXYCODONE-ACETAMINOPHEN 10-325	2	120	30
28-Jun-11	28-Jun-11	MORPHINE SULF ER 30 MG TABLET	2	90	30
18-May-11	18-Jul-11	CARISOPRODOL 350 MG TABLET	1	90	30
25-Jul-11	25-Jul-11	OXYCODONE-ACETAMINOPHEN 10-325	3	120	30
25-Jul-11	25-Jul-11	MORPHINE SULF ER 30 MG TABLET	3	90	30
18-May-11	29-Jul-11	CARISOPRODOL 350 MG TABLET	1	90	30
18-May-11	29-Jul-11	ALPRAZOLAM 1 MG TABLET	1	60	30
18-May-11	21-Aug-11	CARISOPRODOL 350 MG TABLET	1	90	30
22-Aug-11	22-Aug-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
22-Aug-11	22-Aug-11	MORPHINE SULF ER 30 MG TABLET	1	90	30
6-Sep-11	6-Sep-11	ALPRAZOLAM 1 MG TABLET	1	60	30
18-May-11	19-Sep-11	CARISOPRODOL 350 MG TABLET	1	90	30
19-Sep-11	19-Sep-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
19-Sep-11	19-Sep-11	MORPHINE SULF ER 30 MG TABLET	1	90	30
6-Sep-11	8-Oct-11	ALPRAZOLAM 1 MG TABLET	1	60	30
13-Oct-11	16-Oct-11	MORPHINE SULF ER 30 MG TABLET	1	90	30
13-Oct-11	16-Oct-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
16-Oct-11	16-Oct-11	CARISOPRODOL 350 MG TABLET	1	90	30
6-Sep-11	10-Nov-11	ALPRAZOLAM 1 MG TABLET	1	60	30
16-Oct-11	13-Nov-11	CARISOPRODOL 350 MG TABLET	1	90	30
9-Nov-11	14-Nov-11	MORPHINE SULF ER 30 MG TABLET	1	90	30
9-Nov-11	14-Nov-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
16-Oct-11	12-Dec-11	CARISOPRODOL 350 MG TABLET	1	90	30
12-Dec-11	12-Dec-11	ALPRAZOLAM 1 MG TABLET	1	60	30
9-Dec-11	13-Dec-11	OXYCODONE-ACETAMINOPHEN 10-325	1	120	30
9-Dec-11	13-Dec-11	MORPHINE SULF ER 30 MG TABLET	1	90	30

## Patient 2: White Female

Prescription History:  
Jan 2011 – Jun 2017

Opioid Rx (107)  
Benzodiazepine Rx (69)  
Sedative Rx (67)  
Stimulants (8)  
Arrests (1)

Prescribers (22)  
Dispensers (18)

Total Pill count: 9,341

} "Holy Trinity"  
1 prescriber

## Patient 2: White Female

Prescription History:

Jan 2011 – Jun 2017

RxWrittenDate	RxFillDate	Drug Name	Prescriber	Quantity	Days
9-Oct-13	2-Jan-14	ALPRAZOLAM 1 MG TABLET	1	60	30
11-Dec-13	7-Jan-14	CARISOPRODOL 350 MG TABLET	7	90	30
9-Jan-14	9-Jan-14	HYDROMORPHONE 2 MG TABLET	7	230	30
8-Jan-14	9-Jan-14	MORPHINE SULF ER 30 MG TABLET	7	80	27
6-Feb-14	8-Feb-14	MORPHINE SULF ER 30 MG TABLET	7	60	30
8-Feb-14	8-Feb-14	HYDROMORPHONE 2 MG TABLET	7	200	17
6-Feb-14	8-Feb-14	ALPRAZOLAM 1 MG TABLET	7	80	27
6-Feb-14	8-Feb-14	CARISOPRODOL 350 MG TABLET	7	90	30
17-Jul-14	17-Jul-14	HYDROCODON-ACETAMINOPH 7.5-325	8	15	4
18-Sep-14	18-Sep-14	MORPHINE SULF ER 30 MG TABLET	9	20	6
2-Oct-14	2-Oct-14	ALPRAZOLAM 0.5 MG TABLET	10	90	30
2-Oct-14	2-Oct-14	MORPHINE SULF ER 30 MG TABLET	10	90	30
2-Oct-14	2-Oct-14	CARISOPRODOL 350 MG TABLET	10	90	30
2-Oct-14	2-Oct-14	HYDROMORPHONE 2 MG TABLET	10	60	7
2-Oct-14	29-Oct-14	ALPRAZOLAM 0.5 MG TABLET	10	90	30
30-Oct-14	30-Oct-14	HYDROMORPHONE 2 MG TABLET	10	30	3
30-Oct-14	30-Oct-14	MORPHINE SULF ER 30 MG TABLET	10	45	15
30-Oct-14	30-Oct-14	CARISOPRODOL 350 MG TABLET	10	90	30
16-Nov-14	17-Nov-14	HYDROMORPHONE 2 MG TABLET	11	30	7
16-Nov-14	17-Nov-14	MORPHINE SULF ER 30 MG TABLET	11	21	7
2-Oct-14	26-Nov-14	ALPRAZOLAM 0.5 MG TABLET	10	90	30
16-Nov-14	26-Nov-14	CARISOPRODOL 350 MG TABLET	11	21	7
4-Dec-14	5-Dec-14	MORPHINE SULF ER 30 MG TABLET	10	84	28
4-Dec-14	5-Dec-14	HYDROMORPHONE 2 MG TABLET	10	175	60
19-Dec-14	19-Dec-14	ALPRAZOLAM 1 MG TABLET	12	90	30
19-Dec-14	19-Dec-14	CARISOPRODOL 350 MG TABLET	12	90	30
2-Oct-14	24-Dec-14	ALPRAZOLAM 0.5 MG TABLET	10	90	30

Opioid Rx (107)  
 Benzodiazepine Rx (69)  
 Sedative Rx (67)  
 Stimulants (8)  
 Arrests (1)  
 Prescribers (22)  
 Dispensers (18)  
 Total Pill count: 9,341

1<sup>st</sup> heroin arrest: Aug 2014  
 Age: 57

} "Holy Trinity"  
 1 prescriber

} "Holy Trinity"  
 3 prescribers

RxWrittenDate	RxFillDate	Drug Name	Prescriber	Quantity	Days
4-Jan-15	4-Jan-15	MORPHINE SULF ER 30 MG TABLET	13	21	7
4-Jan-15	4-Jan-15	HYDROMORPHONE 2 MG TABLET	13	30	3
19-Dec-14	16-Jan-15	ALPRAZOLAM 1 MG TABLET	12	90	30
19-Dec-14	16-Jan-15	CARISOPRODOL 350 MG TABLET	12	90	30
20-Jan-15	20-Jan-15	HYDROMORPHONE 2 MG TABLET	10	60	15
16-Jan-15	20-Jan-15	MORPHINE SULF ER 30 MG TABLET	10	90	30
21-Jan-15	21-Jan-15	ALPRAZOLAM 2 MG TABLET	12	60	30
19-Dec-14	13-Feb-15	ALPRAZOLAM 1 MG TABLET	12	90	30
19-Dec-14	13-Feb-15	CARISOPRODOL 350 MG TABLET	12	90	30
19-Feb-15	19-Feb-15	ALPRAZOLAM 2 MG TABLET	12	60	30
28-Feb-15	1-Mar-15	MORPHINE SULF ER 30 MG TABLET	14	6	2
28-Feb-15	1-Mar-15	HYDROMORPHONE 2 MG TABLET	14	15	2
4-Mar-15	4-Mar-15	MORPHINE SULF ER 30 MG TABLET	12	45	15
4-Mar-15	4-Mar-15	HYDROMORPHONE 2 MG TABLET	12	128	16
19-Feb-15	13-Mar-15	CARISOPRODOL 350 MG TABLET	12	90	30
15-Mar-15	15-Mar-15	CHERATUSSIN AC SYRUP	15	150	5
19-Feb-15	16-Mar-15	ALPRAZOLAM 2 MG TABLET	12	60	30
26-Mar-15	26-Mar-15	HYDROMORPHONE 2 MG TABLET	12	32	4
1-Apr-15	4-Apr-15	OXYCODONE-ACETAMINOPHEN 5-325	16	20	3
19-Feb-15	16-Apr-15	ALPRAZOLAM 2 MG TABLET	12	60	30
19-Feb-15	12-May-15	ALPRAZOLAM 2 MG TABLET	12	60	30
19-Feb-15	20-May-15	CARISOPRODOL 350 MG TABLET	12	90	30
22-May-15	22-May-15	ALPRAZOLAM 2 MG TABLET	12	30	15
17-Jun-15	17-Jun-15	ALPRAZOLAM 1 MG TABLET	12	120	30
19-Feb-15	9-Jul-15	CARISOPRODOL 350 MG TABLET	12	90	30
16-Jun-15	10-Jul-15	ALPRAZOLAM 2 MG TABLET	12	60	30
17-Jun-15	14-Jul-15	ALPRAZOLAM 1 MG TABLET	12	120	30
15-Jul-15	15-Jul-15	OXYCODONE HCL 5 MG TABLET	17	90	30
19-Feb-15	6-Aug-15	CARISOPRODOL 350 MG TABLET	12	90	30
16-Jun-15	6-Aug-15	ALPRAZOLAM 2 MG TABLET	12	60	30
18-Aug-15	18-Aug-15	OXYCODONE-ACETAMINOPHEN 5-325	18	15	2
20-Aug-15	20-Aug-15	CLONAZEPAM 1 MG TABLET	19	47	47
16-Jun-15	7-Nov-15	ALPRAZOLAM 2 MG TABLET	12	60	30

← 10 pills/day

← 4 pills/day

← 7.5 pills/day

← 8 pills/day

**Patient 2: White Female**  
 Prescription History:  
 Jan 2011 – Jun 2017

Opioid Rx (107)  
 Benzodiazepine Rx (69)  
 Sedative Rx (67)  
 Stimulants (8)  
 Arrests (1)  
 Prescribers (22)  
 Dispensers (18)  
 Total Pill count: 9,341

RxWrittenDate	RxFillDate	Drug Name	Prescriber	Quantity	Days
29-Dec-16	3-Jan-17	DEXTROAMP-AMPHETAMIN 20 MG TAB	12	60	30
29-Dec-16	3-Jan-17	ALPRAZOLAM 2 MG TABLET	12	60	30
29-Dec-16	3-Jan-17	CARISOPRODOL 350 MG TABLET	12	60	30
29-Dec-16	5-Feb-17	ALPRAZOLAM 2 MG TABLET	12	60	30
29-Dec-16	5-Feb-17	CARISOPRODOL 350 MG TABLET	12	60	30
29-Dec-16	5-Feb-17	DEXTROAMP-AMPHETAMIN 20 MG TAB	12	60	30
29-Dec-16	3-Mar-17	ALPRAZOLAM 2 MG TABLET	12	60	30
29-Dec-16	3-Mar-17	CARISOPRODOL 350 MG TABLET	12	60	30
29-Dec-16	4-Apr-17	ALPRAZOLAM 2 MG TABLET	12	60	30
29-Dec-16	4-Apr-17	CARISOPRODOL 350 MG TABLET	12	60	30
4-Apr-17	4-Apr-17	OXYCODONE HCL 5 MG TABLET	20	20	3
28-Apr-17	3-May-17	OXYCODONE HCL 5 MG TABLET	20	5	1
3-May-17	3-May-17	ALPRAZOLAM 2 MG TABLET	12	60	30
3-May-17	3-May-17	CARISOPRODOL 350 MG TABLET	12	60	30
3-May-17	7-May-17	DEXTROAMP-AMPHETAMIN 20 MG TAB	12	60	30
10-May-17	10-May-17	OXYCODONE HCL 5 MG TABLET	21	12	4
3-May-17	1-Jun-17	ALPRAZOLAM 2 MG TABLET	12	60	30
3-May-17	1-Jun-17	CARISOPRODOL 350 MG TABLET	12	60	30
3-May-17	4-Jun-17	DEXTROAMP-AMPHETAMIN 20 MG TAB	12	60	30
4-Jun-17	5-Jun-17	OXYCODONE HCL 5 MG TABLET	22	30	3

**Patient 2: White Female**  
Prescription History:  
Jan 2011 – Jun 2017

Opioid Rx (107)  
Benzodiazepine Rx (69)  
Sedative Rx (67)  
Stimulants (8)  
Arrests (1)  
Prescribers (22)  
Dispensers (18)  
Total Pill count: 9,341

} “Holy Trinity”  
3 prescribers

} “Holy Trinity”  
3 prescribers

# Summary – Heroin data

- ▶ Misuse of and/or addiction to prescription opioids does not progress to heroin use in a strictly linear manner, but rather, *the concurrent use of prescribed opioids is relatively common among heroin users*
  - ▶ Concurrent use of benzodiazepines is also common
- ▶ Practitioners should be made aware that they may be seeing (and prescribing controlled substances to) patients that have already initiated heroin use
- ▶ Brief screening and referral to treatment services is critical in the prevention of opioid-related overdose



# Law Enforcement Response

- Assign detective(s) dedicated to Rx cases
- Pharmacy visits
  - Packets containing: witness statements, custodian of records forms, additional checklists, Rx Fraud Reporting Flyer, checklist of items needed in Rx fraud case
  - Assured HIPAA does not apply in cases of prescription fraud, and Rx info can be provided to law enforcement, via letter from General Counsel
  - Flyers for Rx Diversion & Fraud law CE classes in August
- Detectives explained procedures for when a prescription fraud has occurred
  - Video surveillance, reporting to LE even if the Rx was not filled

# How to Report Prescription Fraud

To report a fraudulent prescription, doctor shopper, or other prescription related crime occurring in Reno or Sparks, please utilize one of the following options:

- **Suspect on scene, call dispatch**
  - **775-334-COPS (334-2677)**
  
- **Rx Fraud Hotline**
  - **775-334-6256**
  
- **Rx Fraud Email**
  - **[RxFraud@reno.gov](mailto:RxFraud@reno.gov)**

Regional Street Enforcement Team



# Law Enforcement Response

## **LAW CE classes**

- Target audience: pharmacists and pharmacy technicians (Covered prescription fraud investigations, as well as new legislative changes relating to prescriptions and the PMP)

## **Training for patrol officers**

- Patrol officers were trained by SET Detectives in what to do if they are called to a prescription fraud case (information to gather, who to refer to for follow-up investigation, etc.)
- 2 Detectives & 1 Sergeant attended "Advanced Pharmaceutical Crime Investigations" class sponsored by HIDTA
- RPD co-sponsored additional pharmaceutical diversion training for law enforcement

# Prescriber Training

- Classes held in September 2016 and May 2017
- Sept. 2016 class:
  - Two speakers – one local primary care physician and one pain specialist/anesthesiologist from New York
- May 2017 class:
  - 7 speakers – combination of physicians, psychologists, pharmacists & treatment providers

Prescriber Control Group: Number of Pills dispensed. N=65 Nevada Prescribers\* Opioid Pill Prescriptions written from February 2017 to August 2017

Opioid Type	Pre-Training	Post-Training	Overall Percent Difference
Codeine	1,045	1,300	24
Hydrocodone	96,630	93,164	-4
Hydromorphone	1,004	876	-13
Methadone	138	182	32
Morphine	2,295	1,935	-16
Oxycodone	5,030	4,078	-19
Oxymorphone	55,317	53,057	-4
Tramadol	60,126	60,937	1
<b>Total</b>	<b>221,585</b>	<b>215,529</b>	<b>-3</b>

Prescriber Training Group: Number of Pills dispensed. N=65 Nevada Prescribers\*  
 Opioid Pill Prescriptions written from February 2017 to August 2017

Opioid Type	Pre-Training	Post-Training	Overall Percent Difference
<i>Low Prescribers**</i>			
Codeine	1,473	798	-46
Hydrocodone	44,434	32,807	-26
Hydromorphone	3,092	2,647	-14
Methadone	1,250	1,750	40
Morphine	24,036	14,413	-40
Oxycodone	37,184	28,137	-24
Oxymorphone	2,700	2,430	-10
Tramadol	17,394	17,542	1
<b>Total</b>	<b>133,577</b>	<b>102,139</b>	<b>-24</b>
<i>Medium Prescribers***</i>			
Codeine	540	450	-17
Hydrocodone	45,258	33,073	-27
Hydromorphone	2,244	2,784	24
Methadone	4,816	5,208	8
Morphine	14,840	16,098	8
Oxycodone	44,222	40,159	-9
Oxymorphone	266	720	171
Tramadol	9,982	9,144	-8
<b>Total</b>	<b>122,708</b>	<b>108,086</b>	<b>-12</b>
<i>High Prescribers****</i>			
Codeine	440	640	45
Hydrocodone	92,834	62,617	-33
Hydromorphone	6,720	5,496	-18
Methadone	4,580	5,120	12
Morphine	3,240	2,500	-23
Oxycodone	86,755	60,971	-30
Oxymorphone	720	1,200	67
Tramadol	29,120	20,250	-30
<b>Total</b>	<b>224,409</b>	<b>158,794</b>	<b>-29</b>
<b>Grand Total</b>	<b>480,694</b>	<b>369,019</b>	<b>-23</b>

# Summary

- Geographically widespread
- Focus on top percentage (1% for us is still 1,300 people)
- Need to reduce flow into street through education
- Future research points:
  - Are your “indicators” indicating?
  - Analysis of “outlier” prescribing behaviors
  - Best predictors for overdose episodes
  - Further analysis of link between prescription drug use and heroin use

*These findings are the sole property of the listed project partners, and may not be shared, disseminated or sold without the express permission of the Reno Police Department. This project was supported by Grant No. 2015-PM-BX-K005 awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the Department of Justice's Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, the Office for Victims of Crime, and the SMART Office. Points of view or opinions in this document are those of the author and do not necessarily represent the official position or policies of the U.S. Department of Justice.*