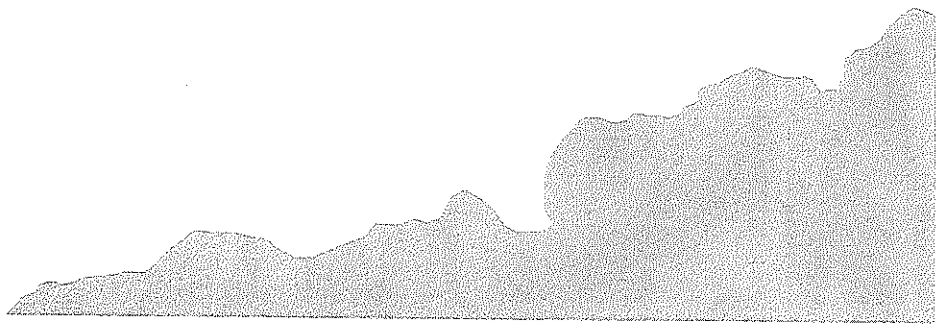
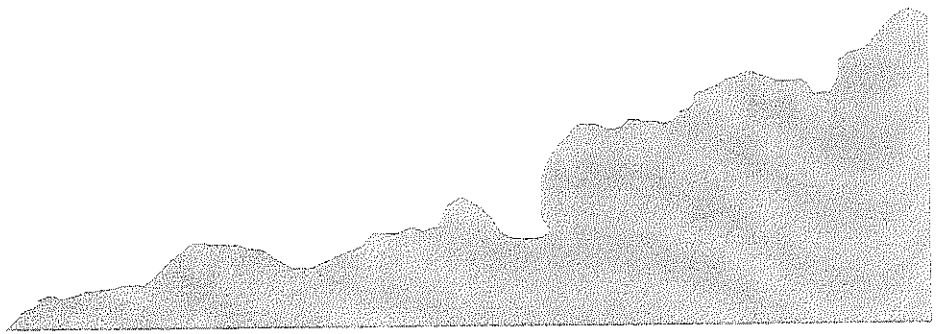
# Pharmacology of opioids*

- Brain produces natural opioids
- Brain does not discriminate between natural opioids and opioids that are self-administered, including heroin
- Natural opioids are involved in a variety of behaviors including:
  - Analgesia
  - Mood
  - Digestion
  - Blood pressure
  - Body temp
  - Respiration
  - Sleep



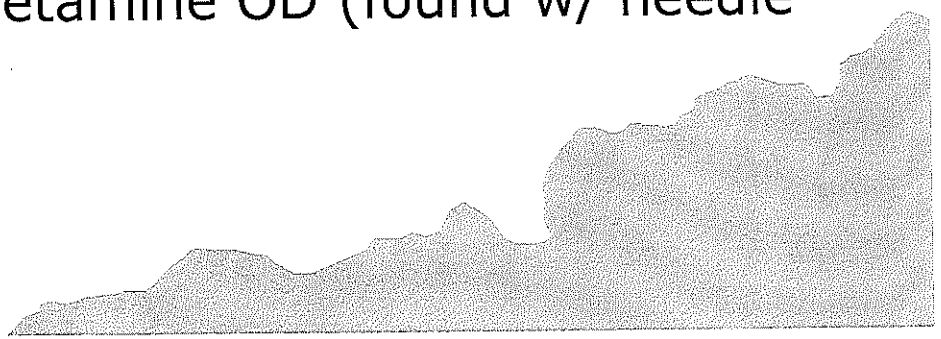
# Pharmacology cont.*

- Natural opioids play an integral role in the brain's pleasure/reward system
- Brain responds to external opioids as if they were biologically essential for survival
- When opioid addiction is full blown, the brain chemistry becomes imbalanced and the nervous system is left in an unbalanced state (i.e. withdrawal, pain, craving, etc.)
- Creates emotional, mental, and physical distress until more opioids are administered



# Recent opioid overdoses

- 144-161 people die from an OD related to heroin and prescription drugs on average each day
- UCLA estimated that there were over 59,000 opiate ODs in 2016
  - More American deaths than the Vietnam (58,220 US military casualties from 1955-1975) and Iraq (4,497 US casualties) Wars
- Deaths
  - Prince – died from fentanyl OD
    - Emergency plane landing 6 days earlier due to OD on percocet (narcan saved him)
  - Philip Seymour Hoffman – died from heroin, cocaine, benzodiazepine, and amphetamine OD (found w/ needle still in his arm)

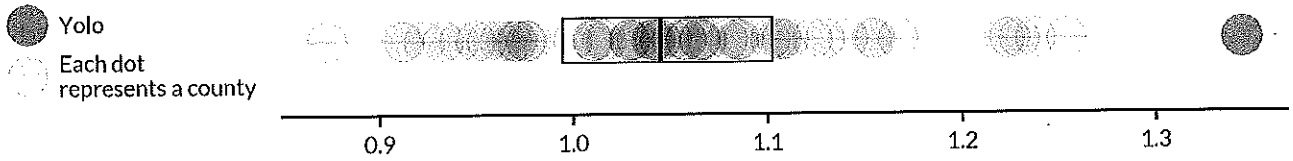


## County Estimates of Opioid Use Disorder and Treatment Needs in California

California County Spotlight: Yolo County, March 19, 2018

- In 2016, an estimated **7.5** percent of people ages 12 years and older (**15,471** people) misused opioids in **Yolo**, and **1.3** percent of people (**2,785** people) had an opioid use disorder (OUD),[a] defined as opioid abuse or dependence. Approximately one-fifth of those who misuse opioids have an OUD.
- The county had **8** opioid overdose deaths in 2016.
- There are **2,143** to **2,429** people with OUD in the county without local access to opioid agonist treatment (i.e. buprenorphine or methadone). Since there are no regulatory barriers to naltrexone and counseling treatments, this snapshot focuses on agonists.

**Percent of the Population 12 Years and Older with Opioid Use Disorder (Abuse or Dependence) in California Counties, Highlighting Yolo[b]**




| County Measure | |
|---|---|
| All opioid overdose deaths, 2016[c] | **8** deaths; **3.7** per 100,000 people |
| Buprenorphine prescriptions, 2016[c] | **2,641** prescriptions; **12.2** per 1,000 people |
| Methadone patients at OTPs, 2016[d] | **0** methadone patients at OTPs |
| Buprenorphine-waivered prescribers, February 2018 estimate[e] | **19** prescribers with a 30-patient limit, **1** prescriber with a 100-patient limit, **0** prescribers with a 275-patient limit; up to **41** prescribers from out of county prescribe to patients in the county. |
| Estimated count and rate of opioid misuse[f] | **15,471** people misused opioids; **7.5** per 100 people |
| Estimated count and rate of OUD[f] | **2,785** people with OUD; **1.3** per 100 people |
| Estimated number of people with OUD who could be treated, given current buprenorphine and methadone treatment capacity[g] | Between **357** and **643** people could be treated given current capacity, depending on how many patients each buprenorphine prescriber treats. |
| Estimated treatment gap, assuming all people with OUD seek treatment[g] | Between **2,143** and **2,429** people with OUD do not have access to treatment, based on current opioid agonist treatment capacity. |
| Count and percent of prescribers with a buprenorphine waiver[e] | There are **884** prescribers in the county, and **2.3%** have a buprenorphine waiver. |
| **Strategies to Meet Demand for Treatment** | |
| **Increase prescribers:**[h] Adding at least **20** prescribers with a 30-patient limit would double the county's waivered prescribers and fill **7.2%** of the treatment gap (if all prescribers treat an average of 9 patients each) or **14.0%** of the treatment gap (if new prescribers treat an average of 15 patients and current prescribers treat half of their maximum waiver capacity). | |
| **Increase resources:** Work with health plans for prescriber outreach; add MAT in health centers, jails, EDs, hospitals, maternity practices, and existing addiction treatment programs; market MAT telehealth to the public; work with opioid treatment programs to add med units and spokes; work with county Alcohol and Drug departments to coordinate counseling and other services; expand MAT services through the Drug Medi-Cal waiver; engage with local opioid safety coalition. | |

**Data sources and notes:**

[a] Opioid misuse is defined as self-reported use of heroin or misuse of prescription pain relievers. OUD is defined as self-report of heroin use or criteria for opioid abuse or dependence consistent with Diagnostic and Statistical Manual of Mental Disorders (DSM-IV).

[b] Each dot in this chart shows the estimated rate of OUD among those 12 years and older in each county. The featured county's rate is shown as a blue dot; other California county rates are shown as dots. The box in the boxplot has a middle line that shows the median rate across counties. The ends of the box show the rate at the lowest/highest quarter of counties.

[c] California Opioid Overdose Surveillance Dashboard. Buprenorphine prescriptions are by patient location and exclude Butrans.

[d] Substance Abuse and Mental Health Services Administration (SAMHSA) 2016 Opioid Treatment Program (OTP) directory.

[e] Estimates based on DEA Active Controlled Substances Act (CSA) Registrants database and Controlled Substance Utilization Review and Evaluation System (CURES) data as well as several data sources; see methods below and the appendix methodology.

[f] Estimates based on National Survey on Drug Use and Health (NSDUH) and other data sources; see appendix. Estimates of opioid misuse and OUD involve prescription opioids and/or heroin.

[g] Estimates based on DEA CSA Registrants database and a range of estimated patients per prescriber; see appendix. Treatment capacity and treatment gap estimates are rounded up to the nearest integer.

[h] Estimates based on OUD prevalence estimates, DEA CSA Registrants database, and a range of estimated patients per prescriber; see appendix. Prescriber estimates are rounded up to the nearest integer. The treatment gap could also be addressed by encouraging currently waivered prescribers to increase the number of patients treated and/or increasing their waiver limit.

**Summary of Methods**

This fact sheet presents data from the California Opioid Overdose Surveillance Dashboard and other data sources, as well as county-level estimates based on new analyses by researchers at the Urban Institute (www.urban.org). To estimate the demand for treatment, we calculated county rates of OUD, starting with estimates of past-year nonmedical use of prescription pain relievers for 26 substate regions in California from the NSDUH (Lipari et al. 2017), and adjusting these estimates for additional NSDUH estimates of heroin use disorder and recent trends. We then used regression models to predict county-level rates as a function of explanatory variables that have an empirical relationship with OUD (Alzeer et al. 2017; Paulozzi et al. 2017). We tested a variety of models that produced similar patterns of results. We applied county-level estimates of the population from the Centers for Disease Control and Prevention (CDC) to create county-level counts, which were adjusted to match the NSDUH substate counts. To estimate county OUD rates, the share of OUD among those who misuse opioids (0.2 based on 2016 national NSDUH estimates) was applied to estimated opioid misuse rates. To estimate buprenorphine MAT capacity, we drew on the DEA Active Controlled Substances Act (CSA) Registrants database, which includes all DATA-waived buprenorphine prescribers. We mapped prescriber addresses to county using a ZIP code to county crosswalk from UDS Mapper and the Census Bureau, and for ZIP codes that map to more than one county, we geocoded addresses through the Google Geocoding API. In counties where the number of prescribers from California's CURES data was larger than our estimate based on DEA data, we adjusted the estimated number of waivered prescribers, preserving the distribution of waiver limits from the DEA data. We calculated county buprenorphine treatment capacity using a lower bound of estimated average capacity in California of nine patients per provider (Thomas et al. 2017) and an upper bound equal to half of a prescriber's estimated maximum patient waiver limit. Treatment capacity related to out-of-county buprenorphine prescribers and methadone slots at OTPs in the county were added. To compute the treatment gap, i.e. the number of individuals with OUD who do not have access to MAT in their county, we assumed that all individuals with OUD are likely to seek MAT. We calculated the treatment gap by subtracting the low and high estimated range of the treatment capacity in each county from the estimated number with OUD. We computed the estimated number of additional 30-waivered buprenorphine prescribers needed per county to achieve capacity to fill the estimated treatment gap. We present strategies to meet demand for treatment, showing a range using lower and upper estimates of the treatment gap and the treatment capacity. In cases where the number of new prescribers needed would be more than double the number of current buprenorphine prescribers, we present an alternative, more feasible strategy of doubling the number of prescribers. In these cases, we present the percent of the treatment gap that would be filled.

For more information on the methods used in producing these estimates, see the methodological appendix at: www.urban.org/research/publication/county-level-estimates-opioid-use-disorder-and-treatment-needs-california.

**About the Authors** Lisa Clemans-Cope is a senior health economist and Marni Epstein is a research assistant in the Urban Institute's Health Policy Center. Doug Wissoker is a senior fellow in the Urban Institute's Statistical Methods Group. Contact: Lisa Clemans-Cope at lclemans@urban.org.

**Suggested Citation:** Lisa Clemans-Cope, Marni Epstein, and Doug Wissoker. County-Level Estimates of Opioid Use Disorder and Treatment Needs in California. The Urban Institute. March 19, 2018.

ASAM American Society *of* Addiction Medicine

Opioid Addiction
2016 Facts & Figures

## Opioid Addiction

- Opioids are a class of drugs that include the illicit drug heroin as well as the licit prescription pain relievers oxycodone, hydrocodone, codeine, morphine, fentanyl and others.[1]
- Opioids are chemically related and interact with opioid receptors on nerve cells in the brain and nervous system to produce pleasurable effects and relieve pain.[1]
- Addiction is a primary, chronic and relapsing brain disease characterized by an individual pathologically pursuing reward and/or relief by substance use and other behaviors.[2]
- Of the 20.5 million Americans 12 or older that had a substance use disorder in 2015, 2 million had a substance use disorder involving prescription pain relievers and 591,000 had a substance use disorder involving heroin.[3]
- It is estimated that 23% of individuals who use heroin develop opioid addiction.[4]

## National Opioid Overdose Epidemic

- Drug overdose is the leading cause of accidental death in the US, with 52,404 lethal drug overdoses in 2015. Opioid addiction is driving this epidemic, with 20,101 overdose deaths related to prescription pain relievers, and 12,990 overdose deaths related to heroin in 2015.[5]
- From 1999 to 2008, overdose death rates, sales and substance use disorder treatment admissions related to prescription pain relievers increased in parallel. The overdose death rate in 2008 was nearly four times the 1999 rate; sales of prescription pain relievers in

---

[1] National Institute on Drug Abuse. (2015). Drugs of Abuse: Opioids. Bethesda, MD: National Institute on Drug Abuse. Available at http://www.drugabuse.gov/drugs-abuse/opioids.

[2] American Society of Addiction Medicine. (2011). Public Policy Statement: Definition of Addiction. Chevy Chase, MD: American Society of Addiction Medicine. Available at http://www.asam.org/docs/publicy-policy-statements/1definition_of_addiction_long_4-11.pdf?sfvrsn=2.

[3] Center for Behavioral Health Statistics and Quality. (2016). Key substance use and mental health indicators in the United States: Results from the 2015 National Survey on Drug Use and Health (HHS Publication No. SMA 16-4984, NSDUH Series H-51). Retrieved from http://www.samhsa.gov/data/.

[4] National Institute on Drug Abuse. (2014). Drug Facts: Heroin. Bethesda, MD: National Institute on Drug Abuse. Available at http://www.drugabuse.gov/publications/drugfacts/heroin.

[5] Rudd RA, Seth P, David F, Scholl L. Increases in Drug and Opioid-Involved Overdose Deaths — United States, 2010–2015. MMWR Morb Mortal Wkly Rep 2016;65:1445–1452.
DOI: http://dx.doi.org/10.15585/mmwr.mm655051e1

2010 were four times those in 1999; and the substance use disorder treatment admission rate in 2009 was six times the 1999 rate.[6]

- In 2012, 259 million prescriptions were written for opioids, which is more than enough to give every American adult their own bottle of pills.[7]
- Four in five new heroin users started out misusing prescription painkillers.[8]
- 94% of respondents in a 2014 survey of people in treatment for opioid addiction said they chose to use heroin because prescription opioids were "far more expensive and harder to obtain."[9]

## Impact on Special Populations

### Adolescents (12 to 17 years old)

- In 2015, 276,000 adolescents were current nonmedical users of pain reliever, with 122,000 having an addiction to prescription pain relievers.[3]
- In 2015, an estimated 21,000 adolescents had used heroin in the past year, and an estimated 5,000 were current heroin users. Additionally, an estimated 6,000 adolescents had heroin a heroin use disorder in 2014.[3]
- People often share their unused pain relievers, unaware of the dangers of nonmedical opioid use. Most adolescents who misuse prescription pain relievers are given them for free by a friend or relative.[10]
- The prescribing rates for prescription opioids among adolescents and young adults nearly doubled from 1994 to 2007.[11]

### Women

- Women are more likely to have chronic pain, be prescribed prescription pain relievers, be given higher doses, and use them for longer time periods than men. Women may become dependent on prescription pain relievers more quickly than men.[12]
- 48,000 women died of prescription pain reliever overdoses between 1999 and 2010.[12]

---

[6] Paulozzi MD, Jones PharmD, Mack PhD, Rudd MSPH. Vital Signs: Overdoses of Prescription Opioid Pain Relievers – United State, 1999-2008. Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control, Center for Disease Control and Prevention. 2011:60:5.

[7] Centers for Disease Control and Prevention. (2014). Opioid Painkiller Prescribing, Where You Live Makes a Difference. Atlanta, GA: Centers for Disease Control and Prevention. Available at http://www.cdc.gov/vitalsigns/opioid-prescribing/.

[8] Jones CM. Heroin use and heroin use risk behaviors among nonmedical users of prescription opioid pain relievers - United States, 2002-2004 and 2008-2010. Drug Alcohol Depend. 2013 Sep 1;132(1-2):95-100. doi: 10.1016/j.drugalcdep.2013.01.007. Epub 2013 Feb 12.

[9] Cicero TJ, Ellis MS, Surratt HL, Kurtz SP. The changing face of heroin use in the United States: a retrospective analysis of the past 50 years. JAMA Psychiatry. 2014;71(7):821-826.

[10] National Institute of Drug Abuse. (2015). Drug Facts: Prescription and Over-the-Counter Medications. Bethesda, MD: National Institute of Drug Abuse. Available at http://www.drugabuse.gov/publications/drugfacts/prescription-over-counter-medications.

[11] Fortuna RJ, Robbins BW, Caiola E, Joynt M, Halterman JS. Prescribing of controlled medications to adolescents and young adults in the United States. Pediatrics. 2010;126(6):1108-1116.

[12] Center for Disease Control and Prevention. (2013). Prescription Painkiller Overdoses: A Growing Epidemic, Especially Among Women. Atlanta, GA: Centers for Disease Control and Prevention. Available at http://www.cdc.gov/vitalsigns/prescriptionpainkilleroverdoses/index.html.

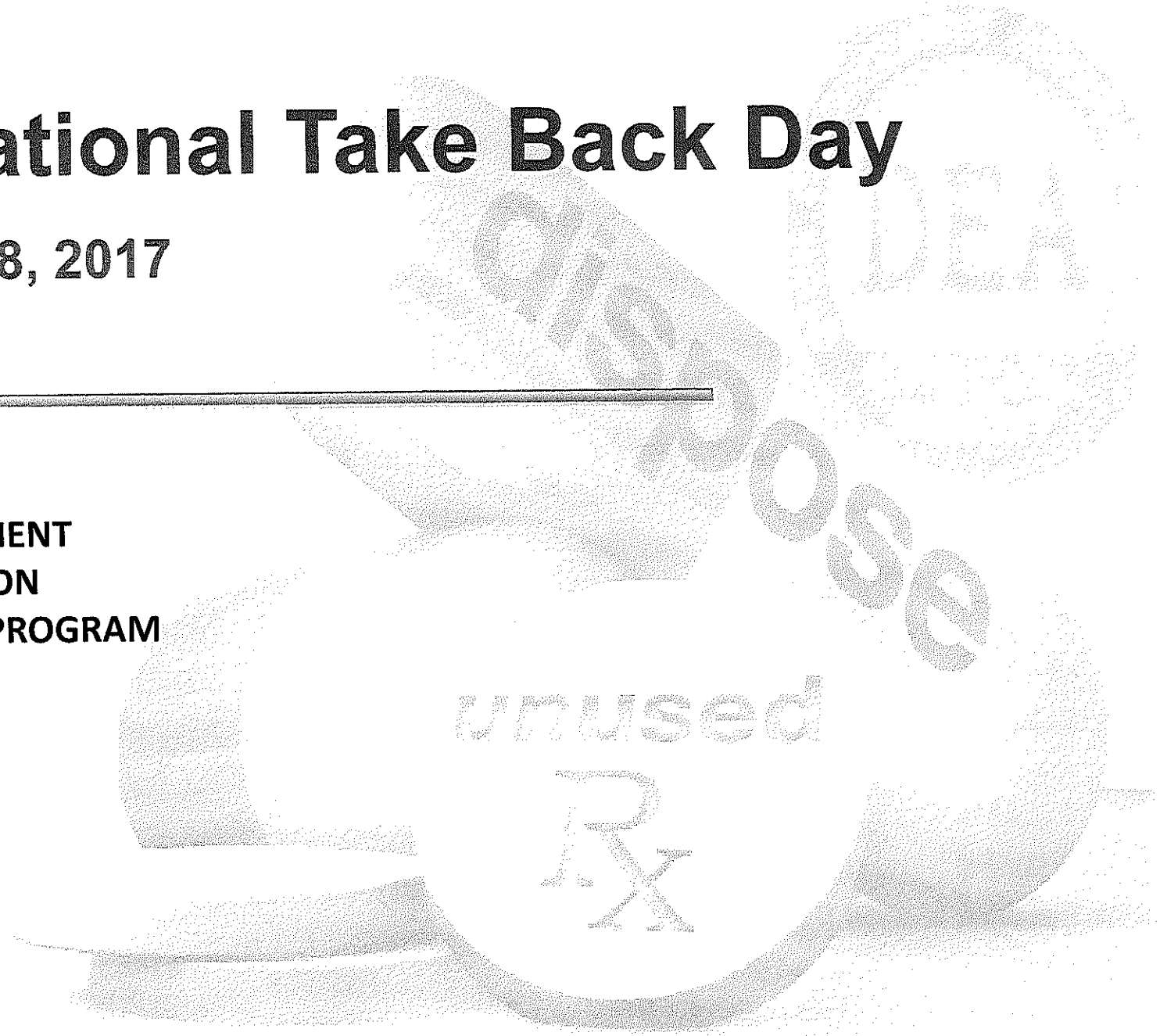
- Prescription pain reliever overdose deaths among women increased more than 400% from 1999 to 2010, compared to 237% among men.[12]
- Heroin overdose deaths among women have tripled in the last few years. From 2010 through 2013, female heroin overdoses increased from 0.4 to 1.2 per 100,000.[13]

[13] Hedegaard H, Chen LH, Warner M. Drug-poisoning deaths involving heroin: United States, 2000–2013. NCHS data brief, no 190. Hyattsville, MD: National Center for Health Statistics. 2015. Available at http://www.cdc.gov/nchs/data/databriefs/db190.htm

# 14th National Take Back Day

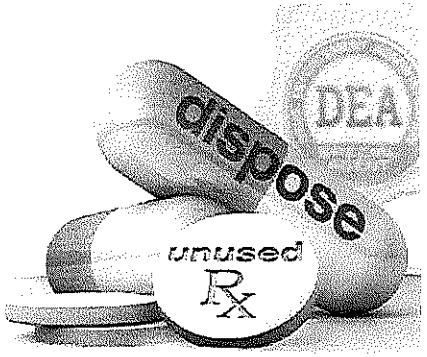
## October 28, 2017

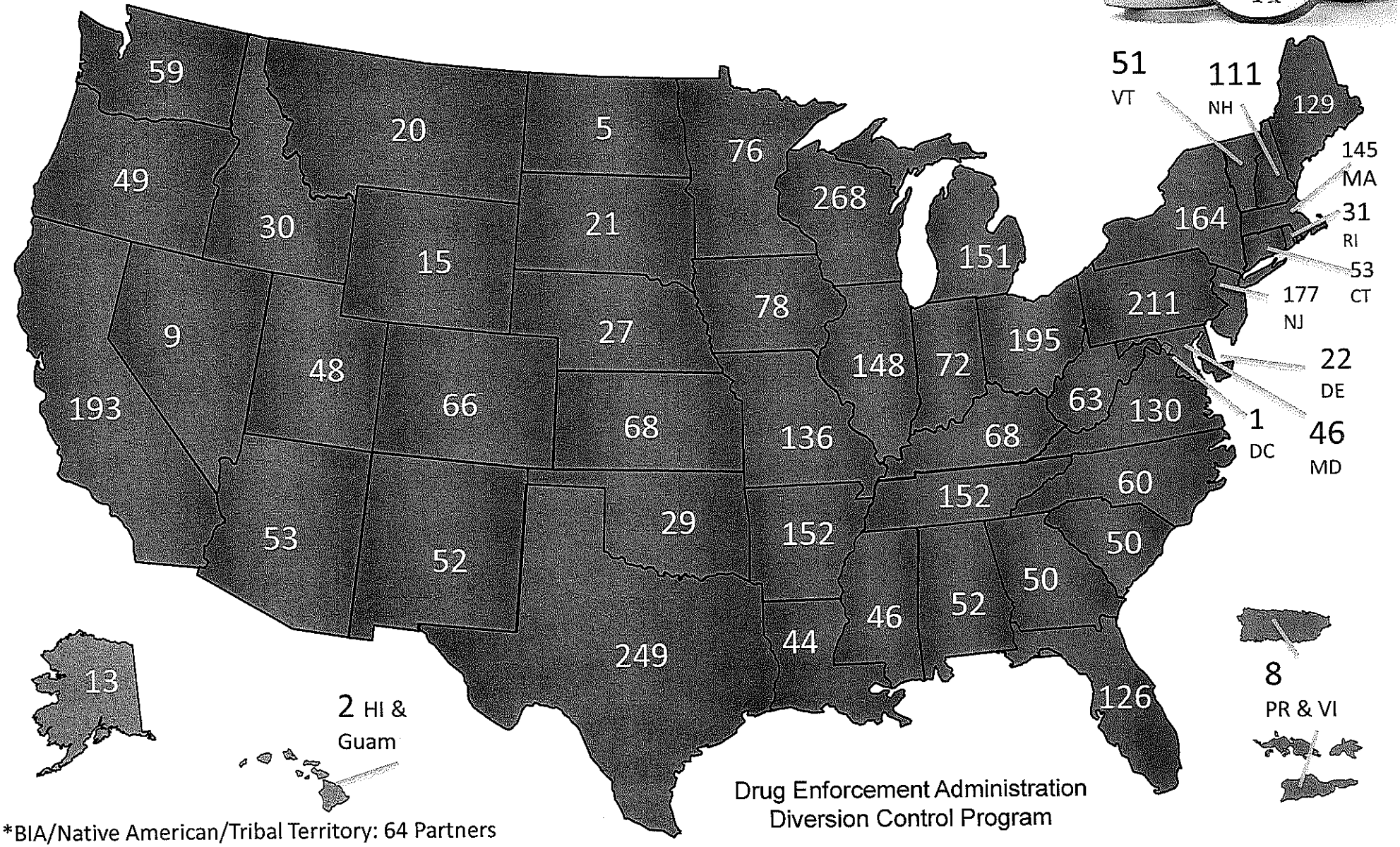
**DRUG ENFORCEMENT**
**ADMINISTRATION**
**DIVERSION CONTROL PROGRAM**



# 14th National Take Back Day: October 28, 2017

**Total Law Enforcement Participation: 4,274**



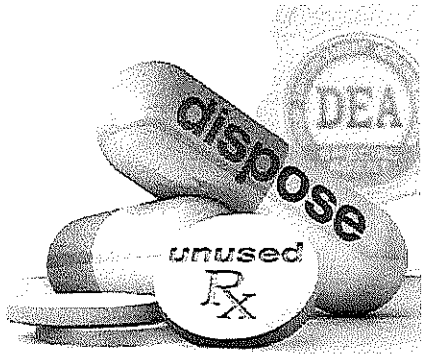



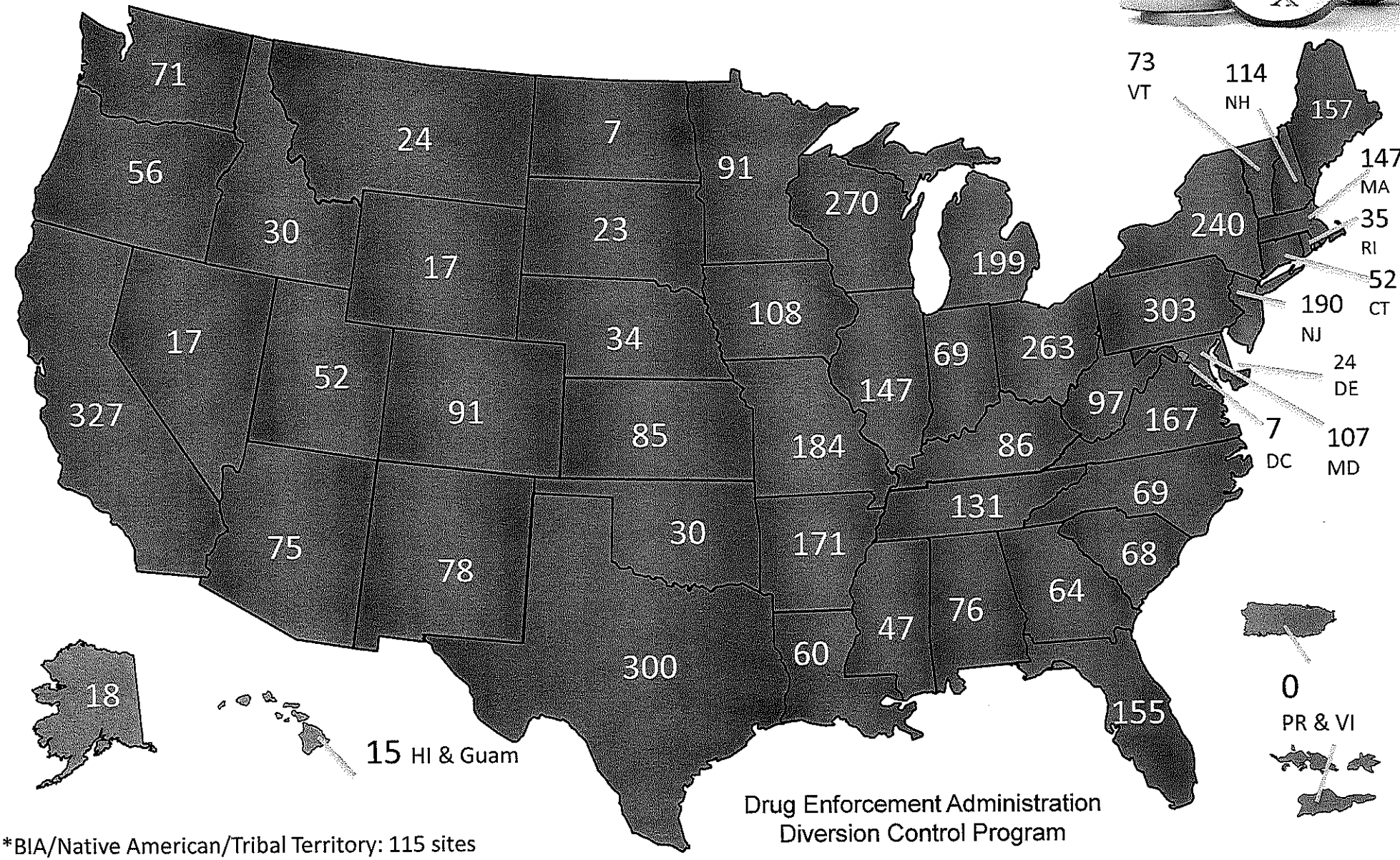

Drug Enforcement Administration
Diversion Control Program

*BIA/Native American/Tribal Territory: 64 Partners

# 14th National Take Back Day: October 28, 2017

**Total Collection Sites: 5,321**



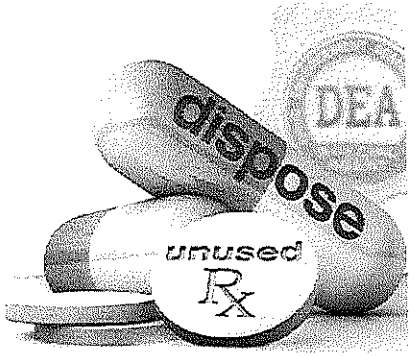



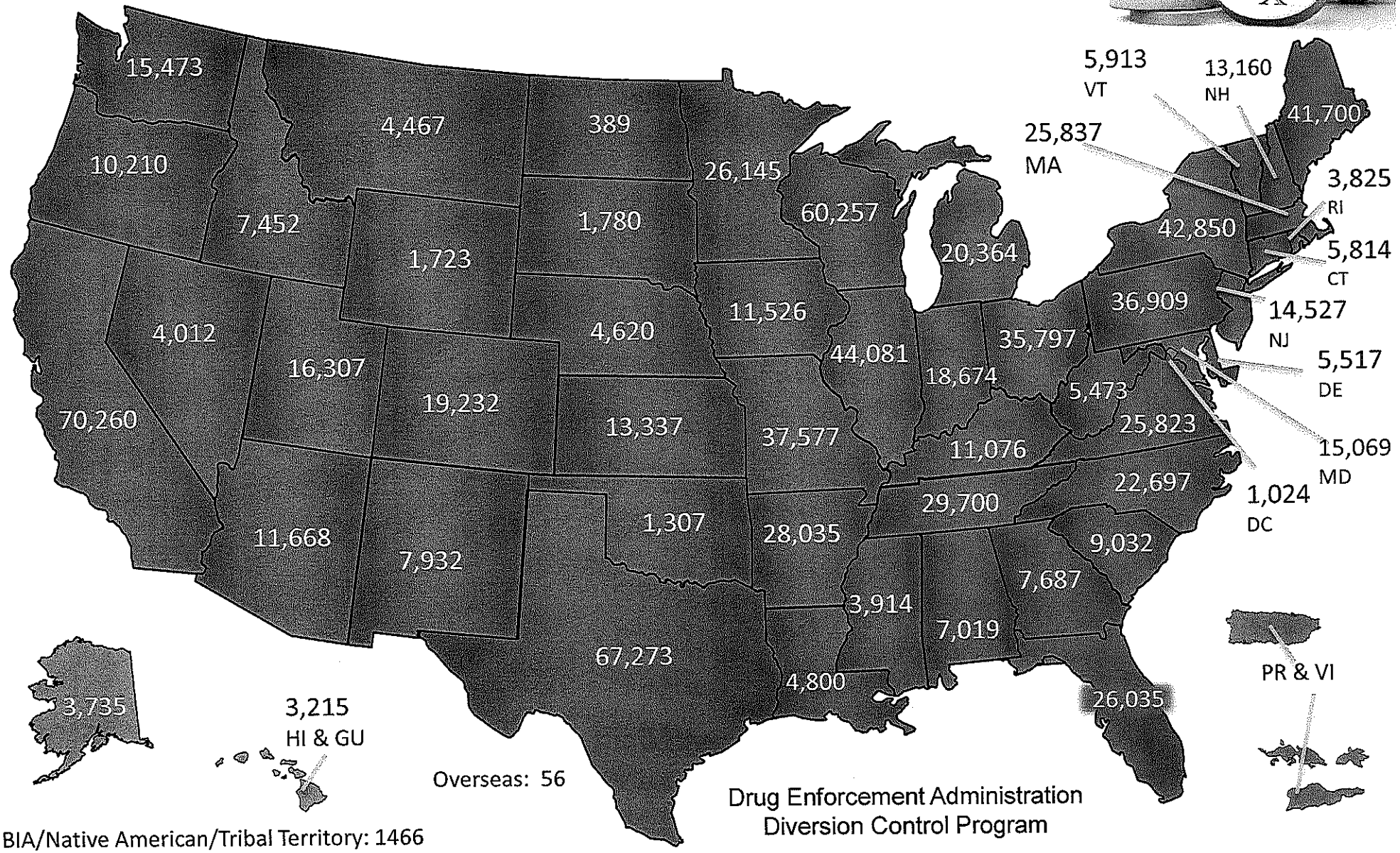

Drug Enforcement Administration
Diversion Control Program

*BIA/Native American/Tribal Territory: 115 sites

# 14th National Take Back Day: October 28, 2017

**Total Weight Collected (pounds): 912,305 lbs. (456 Tons)**




Drug Enforcement Administration
Diversion Control Program

*BIA/Native American/Tribal Territory: 1466