Doctor Shopping Behavior and the Diversion of Opioid Analgesics: 2008-2012

Ron Simeone

Simeone Associates, Inc.

IMS Government Solutions

August 14, 2014

Acknowledgements

This report was prepared by Ron Simeone (Simeone Associates, Inc.) under prime contract #HHSP23330120019C awarded to IMS Government Solutions (IMS-GS), a subsidiary of IMS Health. Farid Khan (IMS-GS) and Xinki Kong (IMS-GS) provided invaluable analytical and data management support, and Alex Khais (IMS-GS) served as our Engagement Manager. Carl Florez (Computer Evidence Specialists) provided technical guidance regarding interpretation of findings. Michael Cala and Cecelia Spitznas were Contracting Officer Representatives for ONDCP.

Executive Summary

Preliminary estimates of diversion for prescription opioids have been developed for the Office of National Drug Control Policy (ONDCP). Diversion can be accomplished in many ways and defined accordingly. Some diversion involves sharing a prescription written for one person with another for whom it was not intended. In such cases the source may be a friend or relative and no money changes hands. Other diversion involves fraudulent representation, or theft, and these actions may be components of a deliberate and well-conceived strategy intended to support illicit for-profit distribution.

The findings presented in this report are based on a tightly circumscribed operational definition of diversion, commonly referred to as "doctor shopping." Behavior of this kind is found when an individual has overlapping prescriptions for drugs of the same class that involve multiple doctors, or multiple pharmacies, or both, and where these events are sufficiently rare so as to arouse suspicion.[1,2,3] Doctor shopping may be a means to acquire drugs for personal use—which is sometimes related to a substance use disorder (SUD)—or a method of generating income (perhaps under the sponsorship of a dealer who pays for medical costs in order to acquire the product).

In this report doctor shopping is examined for the period including calendar years 2008—2012. Analyses are performed on a unique database that provides information on more than 11 billion prescriptions that were dispensed during this period of time and which are matched using encrypted identifiers for doctor, pharmacy, patient, and prescription.[4] A detailed discussion of the data source and methodology can be found in the main report and its appendices. Only the key findings associated with the work are summarized here.

Although the database which is used is enormous in size, and comprehensive in scope, it does not include all doctors, pharmacies, patients, and prescriptions. Because sample coverage is related to the ability to detect doctor shopping, any estimates provided in this report must be regarded as conservative. It is within this context that "upper bound" and "lower bound" estimates are made. These upper and lower bounds should not be interpreted as the confidence interval which would ordinarily be calculated when describing a statistical estimate but rather as estimates that are based upon two alternative operational definitions of doctor shopping—one requiring the involvement of a smaller number of doctors and pharmacies (resulting in an upper bound estimate) and another requiring the involvement of a larger number of doctors and pharmacies (resulting in a lower bound estimate). With this in mind the findings related to the proportion of prescriptions diverted, and the number of prescriptions diverted, are presented below in Exhibit A, and the findings related to the proportion of morphine–equivalent milligrams diverted, and the number of morphine-equivalent milligrams diverted, are presented below in Exhibit B.[5]

Exhibit A. Prescriptions Diverted

	Upper Bound Prescriptions (%)	Lower Bound Prescriptions (%)	Upper Bound Prescriptions (n)	Lower Bound Prescriptions (n)
2008	1.7512	0.1927	4,295,445	472,782
2009	1.5368	0.1368	3,882,450	345,561
2010	1.3530	0.1071	3,532,179	279,637
2011	1.2795	0.0945	3,362,412	248,451
2012	1.2685	0.0834	3,369,660	221,665

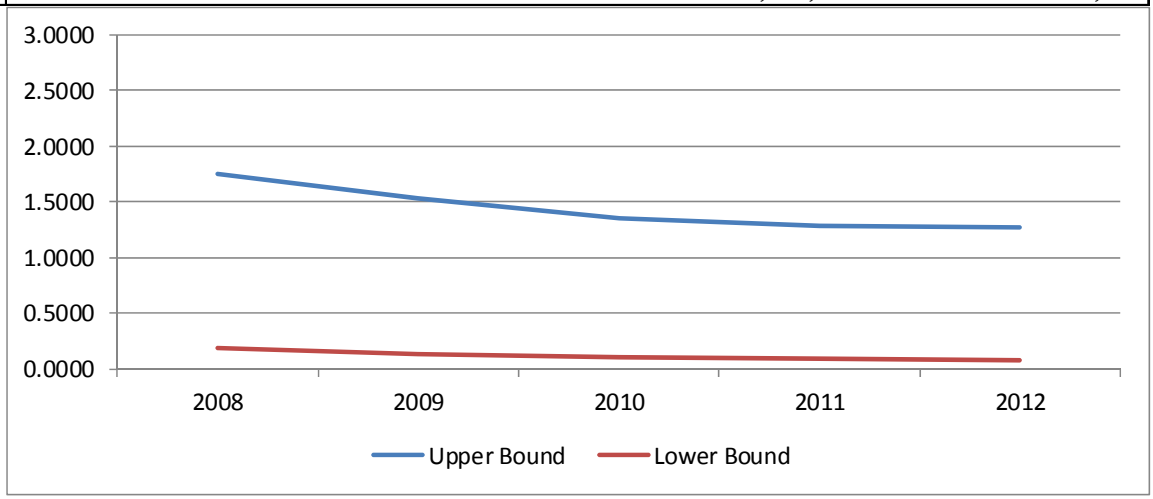
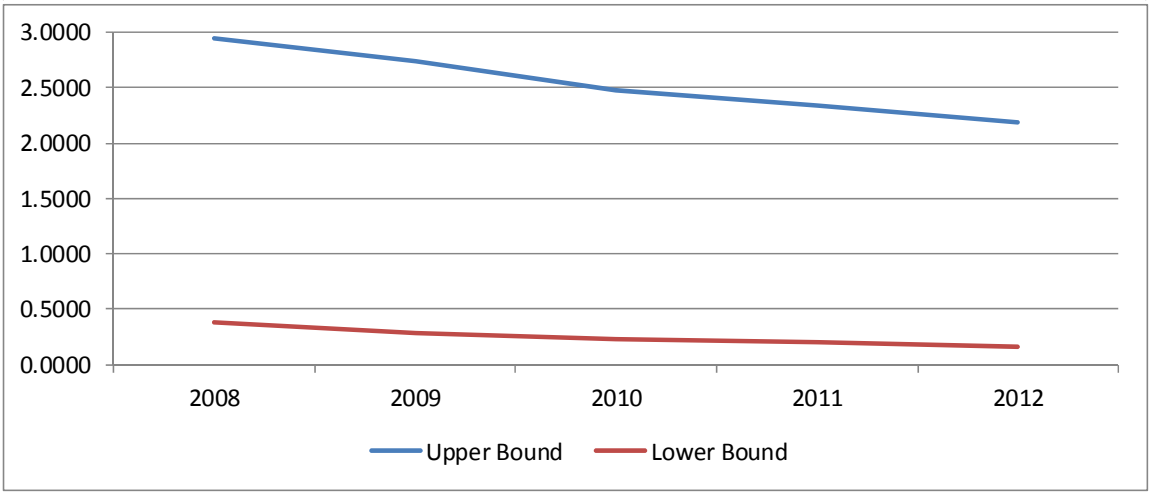


Exhibit B. Morphine-Equivalent Milligrams Diverted

	Upper Bound Milligrams (%)	Lower Bound Milligrams (%)	Upper Bound Milligrams (n)	Lower Bound Milligrams (n)
2008	2.9492	0.3825	6,551,225,405	849,599,352
2009	2.7431	0.2865	6,093,491,236	636,360,172
2010	2.4804	0.2299	5,509,900,609	510,609,476
2011	2.3393	0.2000	5,196,533,648	444,249,460
2012	2.1928	0.1568	4,871,138,710	348,246,842



The findings presented in Exhibit A indicate sustained downward trends in the proportion and number of prescriptions diverted over the period 2008—2012. The upper bound estimate is approximately 1.75% (4.30 million prescriptions) in 2008 and approximately 1.27% (3.37 million prescriptions) in 2012. The lower bound estimate is approximately 0.19% (473 thousand prescriptions) in 2008 and approximately 0.08% (222 thousand prescriptions) in 2012.

The findings presented in Exhibit B also indicate sustained downward trends in the proportion and number of milligrams diverted. The upper bound estimate is approximately 2.95% (6.55 billion morphine-equivalent milligrams) in 2008 and approximately 2.19% (4.87 billion morphine-equivalent milligrams) in 2012. These numbers equate to 6.55 and 4.87 morphine-equivalent metric tons, respectively. The lower bound estimate is approximately 0.38% (849.60 million morphine-equivalent milligrams) in 2008 and approximately 0.16% (348.25 morphine-equivalent million milligrams) in 2012. These numbers equate to approximately .85 and .34 morphine-equivalent metric tons, respectively.

The findings for the upper bound estimate are used in more detailed analyses throughout the body of the main report. This is because findings associated with the lower bound are based upon extraordinarily restrictive criteria (only the most active of the most active doctor shoppers qualify for inclusion there).

The drugs that figure prominently when doctor shopping is defined using criteria for the upper bound estimate are those most commonly prescribed: oxycodone (marketed under the brand name OxyContin®) and hydrocodone (marketed under the brand names Vicodin® and Lortab®).

- In 2008 oxycodone-based products constituted 33.90% of all prescriptions diverted and 56.33% of all morphine-equivalent milligrams diverted. In 2012 these numbers were about the same: 32.56% and 49.46% respectively.
- In 2008 hydrocodone-based products constituted 37.90% of all prescriptions diverted and 15.26% of all morphine-equivalent milligrams diverted. In 2012 these numbers were about the same: 32.70% and 14.21% respectively.

The ratio of percent prescriptions diverted to morphine-equivalent milligrams diverted is higher for oxycodone than for hydrocodone and this reflects in part the difference in their morphine-equivalence conversion factors. Milligram for milligram oxycodone is a more potent drug than hydrocodone. When the information presented in Exhibit A and Exhibit B is examined not only over time, but across space (geography) as well, the declines appear to be pervasive and widespread (Exhibit C and Exhibit D). These findings are presented for each year in the main report. The results suggest that the efforts of government to stem the tide of prescription opioid diversion may have been effective—at least when diversion is operationally defined as doctor shopping.

Exhibit C. Percent Prescriptions Diverted (2008 v 2012)

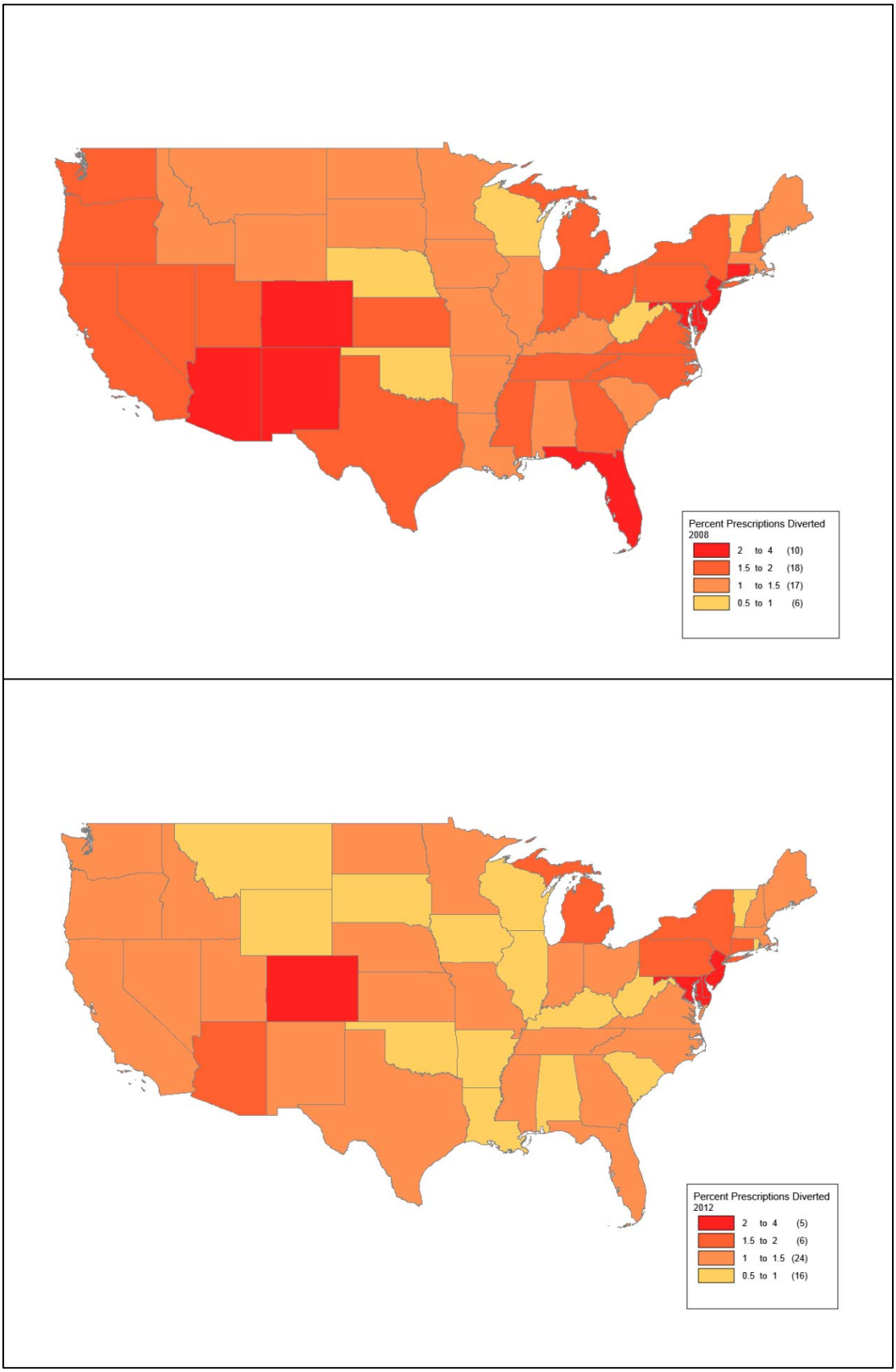
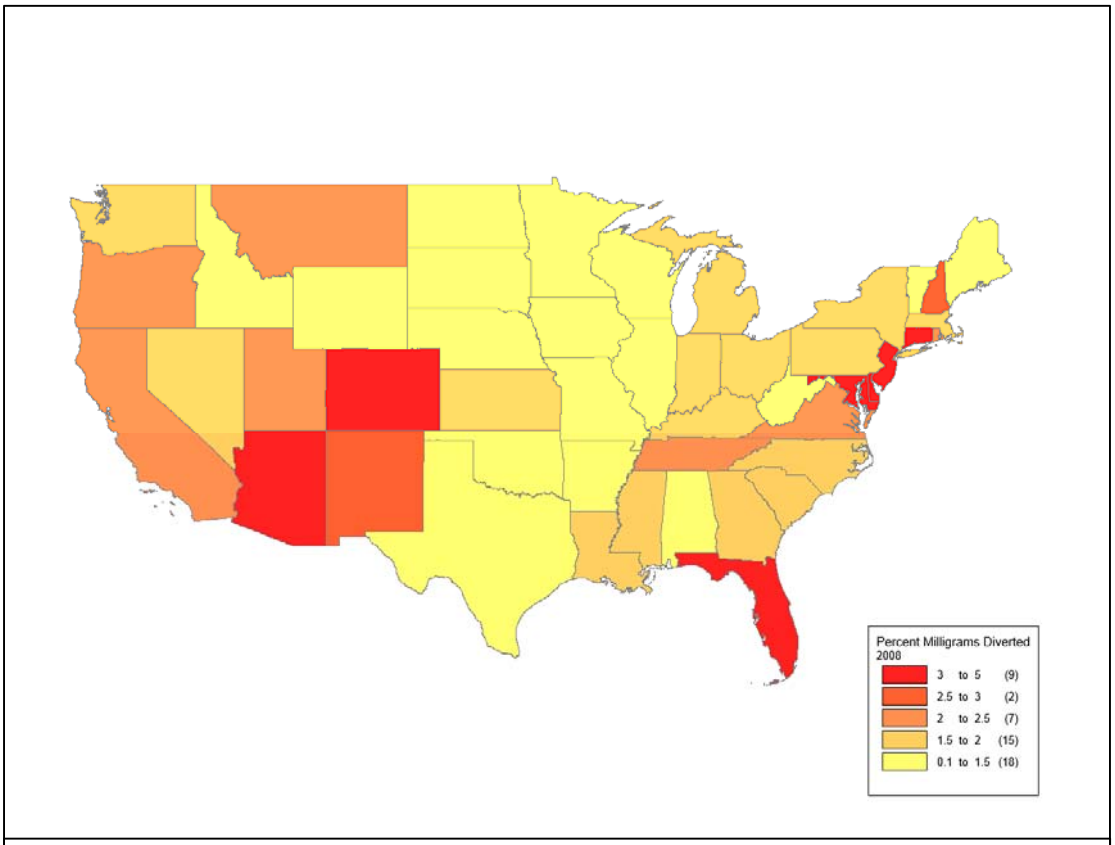
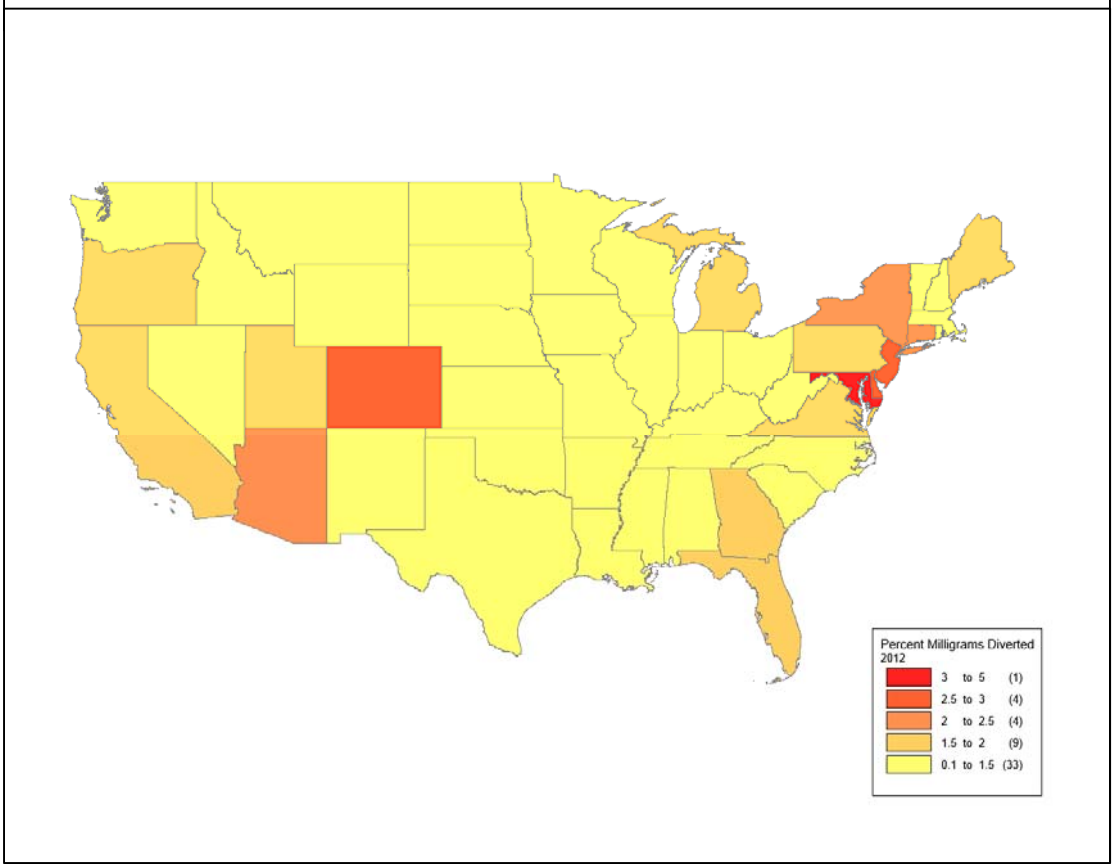


Exhibit D. Percent Morphine-Equivalent Milligrams Diverted (2008 v 2012)





The trends described above must be assessed in light of other information that is available regarding the nonmedical use of prescription opioids. Data provided by the National Survey on Drug Use and Health (NSDUH) indicate that both past year and past month nonmedical use of prescription opioids remained relatively stable over the period under study (the former holding constant at about 4.82% and the latter holding constant at about 1.95% during the decade ending 2012).[6]

But other findings indicate that the consequences of nonmedical use of prescription opioids continue to accumulate. Each year the Substance Abuse and Mental Health Services Administration (SAMHSA) provides estimates of emergency department (ED) visits through its Drug Abuse Warning Network (DAWN). Findings related to the drugs of interest here are provided below in Exhibit E. The presence of such drugs does not necessarily indicate that their use was the reason for a visit. But the data nonetheless provide a valuable gauge with which to measure prevalence.[7]

Exhibit E. DAWN ED Visits

Year	2004	2005	2006	2007	2008	2009	2010	2011	%Change
Drug									
Buprenorphine	—	—	4,440	7,136	12,544	14,266	15,778	21,483	—
Codeine	7,176	6,181	6,928	5,648	8,235	7,962	7,928	9,927	—
Fentanyl	9,823	11,211	16,012	15,947	20,179	20,945	21,196	20,034	104
Hydrocodone	39,846	47,194	57,550	65,734	89,052	86,258	95,972	82,480	107
Hydromorphone	3,385	4,714	6,780	9,497	12,142	14,337	17,666	18,224	438
Methadone	36,806	42,684	45,130	53,950	63,629	63,031	65,945	66,870	82
Morphine	14,090	15,762	20,416	29,591	28,818	31,731	29,605	34,593	146
Oxycodone	41,701	52,943	64,891	76,684	105,526	148,974	146,355	151,218	263
Propoxyphene	6,744	7,648	6,220	7,401	13,364	9,526	8,832	1,655	-75
Tramadol	4,849	5,918	6,048	8,039	11,850	15,349	16,251	20,000	312
Total	164,420	194,255	229,975	272,491	352,795	398,113	409,750	405,001	146

Over the period 2004—2011 ED visits involving prescription opioids increased by approximately 146%. There is a fairly steady trend with some leveling off occurring between 2009 and 2011. Increases in all drugs are apparent with the exception of propoxyphene—which the Food and Drug Administration (FDA) withdrew from the market during 2010.[8]

A similar phenomenon is found when admissions to drug treatment programs are examined. During the decade ending in calendar 2010, admissions to treatment in which a non-heroin opioid was indicated as the primary drug of abuse grew from 2.1% to 8.6%—surpassing cocaine as the primary drug of abuse. [9,10]

These findings, taken as a whole, may be manifestations of the normal course of a drug use epidemic, in which incidence rises rapidly, reaches a plateau, and then declines; and where prevalence eventually becomes the residual product of long term use, resulting ultimately in contact with health care and drug treatment systems.[11,12,13,14] And they reinforce, not surprisingly, the importance of early detection and intervention in minimizing the consequences of drug-using behavior.[15]

At the same time they highlight the need for further investigation into the sources of supply upon which chronic nonmedical users of prescription opioids depend. If doctor shopping declined even as admission to drug treatment programs increased then it may be that the broad reduction in doctor shopping behavior which occurred was insufficient to affect the relatively small number of people who were persistent users. And they imply that the roles of theft, sponsorship, and more highly organized forms of criminal activity in perpetuating diversion must be addressed.[16]

Notes

[1] Cepeda MS, Fife D, Chow W, Mastrogiovanni G, Henderson SC. Assessing opioid shopping behavior: a large cohort study from a medication dispensing database. Drug Safety 2012; 35(4): 325-334.

[2] Cepeda MS, Fife D, Chow W, Mastrogiovanni G, Henderson SC. Opioid shopping behavior: how often, how soon, which drugs, and what payment method. Journal of Clinical Pharmacology 2012; 53(1):112-7. doi:10.1177/0091270012436561.

[3] McDonald DC, Carlsen, KE. Estimating the prevalence of opioid diversion by "doctor shoppers" in the United States. PLoS ONE 2013; 8(7): e69241. doi:10.1371/journal.pone.0069241.

[4] Prescription data are proprietary to IMS Health and were made available for use here by its subsidiary IMS Government Solutions (IMS-GS) in its capacity as prime contractor for this project.

[5] Opioid analgesics may be expressed in terms of their potency relative to morphine. When this is done it allows milligrams associated with prescriptions of this kind to be summed and expressed in terms of a common metric. Conversion factors necessary for this purpose were provided by the Centers for Disease Control (CDC) and are based upon all research findings in existence at the time of this writing.

[6] Substance Abuse and Mental Health Services Administration, Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings (Detailed Tables), NSDUH Series H-46, HHS Publication No. (SMA) 13-4795. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2013a.
2012 Tables: Trend - 7.1 to 7.45 (PE), SAMHSA, CBHSQ

[7] Substance Abuse and Mental Health Services Administration, Drug Abuse Warning Network, 2011: National Estimates of Drug-Related Emergency Department Visits. HHS Publication No. (SMA) 13-4760, DAWN Series D-39. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2013b.
Drug Abuse Warning Network, 2011: National Estimates of Drug-Related Emergency Department Visits

[8] Xanodyne Pharmaceuticals Inc. (which made Darvon and Darvocet—brand names for the prescription opioid analgesic propoxyphene), agreed to withdraw their product from the US market at the request of the Food and Drug Administration in November 2010.
Press Announcements > Xanodyne agrees to withdraw propoxyphene from the U.S. market

[9] Original analysis: Treatment Episode Data Set – Admissions (TEDS-A), 2001. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. U.S. Department of Health and Human Services. ICPSR 3884. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2004-02-05.
Treatment Episode Data Set -- Admissions (TEDS-A), 2001

[10] Original analysis: Treatment Episode Data Set – Admissions (TEDS-A), 2010. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. U.S. Department of Health and Human Services. ICPSR 33261. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2012-07-17.
Treatment Episode Data Set -- Admissions (TEDS-A), 2010

[11] For a review of the literature in this area see: Caulkins JP. Models Pertaining to How Drug Policy Should Vary Over the Course of an Epidemic Cycle. In: Lindgren, B. & Grossman, M. (eds.) Substance Use: Individual Behavior, Social Interactions, Markets, and Politics, Advances in Health Economics and Health Services Research, 16: 407-439. Elsevier 2005.

[12] See, for example, Golub A, Brownstein H, Dunlap, E. Monitoring Drug Epidemics and the Markets That Sustain Them, Arrestee Drug Abuse Monitoring (ADAM) and ADAM II Data, 2000-2003 and 2007-2010. ICPSR33201-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2012-12-13. doi:10.3886/ICPSR33201.v1
Monitoring Drug Epidemics and the Markets That Sustain Them, Arrestee Drug Abuse Monitoring (ADAM) and ADAM II Data, 2000-2003 and 2007-2010

[13] Rossi C. The role of dynamic modeling in drug abuse epidemiology. Bulletin on Narcotics 2002; 54(1-2): 33-44.

[14] The dynamic behavior of epidemics is ultimately the aggregate product of the dynamic behavior associated with individual-level drug use careers. For a review of the literature in this area and an application see: Simeone R, Holland L, Viveros-Aguelara R. Estimating the size of an illicit drug-using population. Statistics in Medicine 2003; 22(19): 2969-2993.

[15] Caulkins JP. The Need for Dynamic Drug Policy. Heinz Research Paper 23 2006.
http://repository.cmu.edu/heinzworks/23

[16] Rigg KK, Kurtz SP, Surratt HL. Patterns of prescription medication diversion among drug dealers. Drugs (Abingdon Engl) 2012; 19(2): 144-155.
doi:10.3109/09687637.2011.631197

Table of Contents

List of Tables

List of Figures

Chapter 1. Introduction

The Substance Abuse and Mental Health Services Administration (SAMHSA) has reported that the rates of initiation, past month prevalence, and past year prevalence of nonmedical prescription opioid use among those aged 12 and over have remained generally constant over much of the past decade. Rates of initiation, past month prevalence, and past year prevalence have actually declined during this same period of time among youth aged 12-17 and young adults aged 18-25 (SAMHSA, 2013a).

Although some of this is encouraging news other statistics reveal the dark consequences of nonmedical prescription opioid use—as those who were once initiates continue to use and progress ultimately toward a diagnosable substance use disorder (SUD) and contact with organizations providing health and other drug treatment services.

Between 2005 and 2011 emergency department (ED) visits involving prescription opioids increased by 146% according to data provided by the Drug Abuse Warning Network (DAWN: SAMHSA, 2013b). Similarly, in the decade beginning 2001 and ending 2010, findings from the Treatment Episode Data Set (TEDS) indicate that prescription opioids (defined as non-prescription methadone and "other opiates" excluding heroin) as the primary drug of abuse increased from 2.1% to 8.6%, surpassing cocaine as a proportion of all admissions (SAMHSA, 2004, 2012).

In response to what has been perceived as a public health problem of the greatest importance, the President has proposed a strategy that calls for increased education of parents, children, patients and health care providers regarding the dangers of prescription opioids; continued implementation of Prescription Drug Monitoring Programs (PDMPs); introduction of measures designed to ensure proper disposal of unused prescription opioids; and increased law enforcement efforts intended to deter the illicit prescribing and dispensing of such drugs (Executive Office of the President of the United States, 2011).

The continued refinement of this plan will require that deep insight be gained into the actual mechanisms of diversion that exist, as well as the manner in which they are interrelated, and of the measures that must be taken to decrease misuse, abuse, and diversion.

Since continued nonmedical use requires a sustained supply it is important to identify the sources upon which individuals depend to acquire their drugs. A large part of the problem lies in the ready availability of prescription opioids in the social environment. Increases in morphine-equivalent milligrams per capita have been marked in every state across the country and have exhibited exponential growth in some cases. This growth in availability can be traced to at least two causes.

The first and perhaps the most important involved the recognition that pain itself was a phenomenon which could be diagnosed and should be treated. To the extent that the reasoning behind this could be extended easily to include both physical and mental discomfort (which often co-occur) a new emphasis on palliative treatment led to increased rates of prescription for certain drugs and to the establishment of organizations and areas of specialization (such as pain management) that had not previously existed. All things being equal, increased diversion of opioid analgesics and other drugs from the health care system was inevitable. This is true both because of the sheer increase in availability of such drugs, and because increased opportunities for illegal commerce were created as a byproduct.

The second was commensurate with the focus on palliative care and occurred when the pharmaceutical industry developed new and more effective formularies for pain management. OxyContin® may be counted among these. More options likely resulted in more prescriptions.

Taken together these conditions created what one professional organization characterized as "a perfect storm" that allowed the diversion and nonmedical use of prescription opioids to become increasingly prevalent in American society (Coalition against Insurance Fraud, 2007).

Research findings released by SAMHSA suggest that the vast majority of prescription opioids which find their way into the possession of nonmedical users originate from legitimate sources. This may occur when a physician, perhaps unknowledgeable regarding protocols for pain management, "overprescribes" in response to a presenting problem; or simply when prescriptions that—for whatever reason—are not taken as indicated and find their way into the hands of other users (SAMHSA 2013a).

But this finding may not be representative for those engaged in chronic nonmedical use and where a reliable source capable of providing drugs in sufficient quantity is needed. Such individuals may have a diagnosable SUD and—acting alone or under the sponsorship of a dealer—frequent multiple doctors and multiple pharmacies in an effort to acquire prescription opioids. This behavior, commonly referred to as "doctor shopping," is the subject of our report. Our intent is to describe its magnitude, characteristics, and variability over time and across space.

Chapter 2. Characteristics of the Data

The data used to support our analysis were provided by IMS-Government Solutions (IMS-GS) a subsidiary of IMS Health. These data are unique in a number of ways. Our intent is to measure doctor shopping behavior over the period 2008—2012 and during this time IMS Health gathered information on more than 11 billion prescription records.

There is no other resource of this kind available and the size of the sample allows rare events, such as doctor shopping, to be detected. Further, each doctor, pharmacy, patient, and prescription in their "data warehouse" is associated with a unique encrypted identifier that is consistent across geographic locations. And this, in principle, allows differences in doctor, pharmacy, and patient behavior to be examined over time and across space. Although the sample is very large the data collection process is opportunistic. The sample has no formal statistical properties and this limits the extent to which findings can be generalized to all doctors, pharmacies, patients, and prescriptions in the United States. It also poses certain analytical challenges and these are discussed below.

The organization has a sophisticated (and proprietary) system for weighting its data at the pharmacy-outlet level. A roster is established for any given year for all known outlets and agreements are made between it and *some of these outlets* to provide prescription records. In cases where such agreements cannot be made, values for numbers of prescriptions by drug are imputed using information derived from pharmacies of a similar size and type, and within some arbitrarily circumscribed radius, with which agreements *have* been made. This allows projection to any level of geographic aggregation based upon the known and imputed numbers. But this system cannot of its own accord yield valid estimates of diversion. In the simplest case the rate of diversion is just the number of suspect prescriptions divided by the total number of prescriptions dispensed. Projections made in the manner described above do not alter the ratio of diverted to total prescriptions—they only increase the numbers in the numerator and the denominator by a constant. The ratio itself remains a function of detection and detection remains a function of sample coverage.

The organization receives information on the prescribing and dispensing behavior of hundreds of thousands of entities on a continuous basis. This information is consolidated via "feeds" that comprise groups of pharmacies. Pharmacies have certain characteristics related to size, type, and geographic location. Over time births and deaths occur among feeds. Some begin contributing to the pool of pharmacies that provide prescription records while others cease entirely. As this occurs, the characteristics of the sample change, systematically, and in a manner that is correlated with the behavior of doctors, pharmacies, and patients.

The effects of this "churning" can be quite dramatic since any one feed may be associated with tens of millions of prescriptions. This presents a problem because we would like to examine doctor shopping behavior over time and some method of stabilization must be introduced in order to ensure comparability among doctors, pharmacies, and patients over time.

Our solution to these problems involves the use of two pharmacy panels, one intended to maximize sample coverage (and therefore the ability to detect doctor shopping events) and another intended to hold the participation of pharmacies constant over time (thereby allowing the estimation of change in the rate of doctor shopping behavior to be observed).

(1) We refer to the first as a "base year sample" and it includes all pharmacies that reported on at least 95% of their claims during calendar 2012. This selection criterion yields 35,311 pharmacies (see Figure 1 and Figure 2 which illustrate the distribution of the number of participating pharmacies across states and zip-three areas, respectively; and Figure 3 and Figure 4 which illustrate the distribution of the rate of pharmacy coverage across states and zip-three areas, respectively).

At the state level these pharmacies are associated with 60,732,837 unweighted prescriptions and with 265,644,177 weighted prescriptions. At the zip-three level these pharmacies are associated with 60,732,837 unweighted prescriptions and with 264,778,101 weighted prescriptions.

Weighted estimates for states are essentially projections based upon zip-three level data that have been adjusted so as to correspond with the number of pharmacies that exist within each state. Weighted estimates for zip-three areas are not adjusted in this manner. Since all zip-three areas are not represented in the data the zip-three-level estimates are slightly lower than the state-level estimates. Mean state-level pharmacy coverage for the base year sample and mean zip-three area pharmacy coverage for the base year sample are approximately the same, each representing 30% of the pharmacy universe.

(2) We refer to the second as a "five-year stability sample" and it includes all pharmacies that reported on at least 95% of their claims over the entire 2008—2012 period. This selection criterion yields 8,954 pharmacies (see Figure 5 and Figure 6 which, as above, illustrate the distribution of the number of participating pharmacies across states and zip-three areas, respectively; and Figure 7 and Figure 8 which illustrate the distribution of the rate of pharmacy coverage across states and zip-three areas, respectively).

At the state level these pharmacies are associated with an average of 35,589,553 unweighted prescriptions per year and with an average of 257,483,435 weighted prescriptions per year. At the zip-three level these pharmacies are associated with an average of 35,589,553 unweighted prescriptions per year and with an average of 252,528,537 weighted prescriptions per year.

Weighted estimates for states are again projections based upon zip-three level data that have been adjusted so as to correspond with the number of pharmacies that exist within each state. And weighted estimates for zip-three areas are not adjusted in this manner. Since all zip-three areas are not represented in the data the zip-three-level estimates are slightly lower than the state-level estimates. Mean state-level coverage for the five-year stability sample and mean zip-three area pharmacy coverage for the five-year stability sample are approximately the same, each representing 12% of the pharmacy universe.

The ability to detect overlapping prescriptions written for the same patient by multiple doctors, and filled for this patient by multiple pharmacies, will of necessity increase as the proportion of all pharmacies represented in the sample increases.[1] And so estimates of diversion derived from the five-year stability sample will be biased downward relative to those derived from the base year sample since mean coverage is approximately 12% in the five-year stability sample and 30% in the base year sample.

In our analysis we assume that the *percent change* in diversion which occurs from year to year in the five-year stability sample may be regarded as unbiased even though the estimate of diversion itself is known to be biased downward. For this to be true variability in the rate of coverage in the five-year stability sample must be uncorrelated with the percent change in diversion that occurs from one year to the next. Having examined the data in some detail we conclude that the assumption is tenable.

We compensate for the downward bias in estimates of diversion derived from the five-year stability sample by using information from the base year sample to rescale these numbers. A hypothetical example might be in order at this point. If we knew from the five-year stability sample that the rate of diversion was 5% in 2011 and 10% in 2012 we would also know that the rate of change between 2011 and 2012 was 100%. But these estimates of diversion would rest upon on a sample coverage rate of approximately 12%. If the base year sample were examined we might find a rate of diversion of 20% for 2012. We would regard this as more believable because the coverage rate for the base year sample is 30%. And this would imply that the rate of diversion for 2011 was actually 10%.[2]

[1] We demonstrate the effect of sample coverage on the ability to detect doctor shopping events in Chapter 5.
[2] Bias can enter the estimation procedure in other ways as well. In this example, the estimate made using the base year sample might itself be conservative. Although the coverage rate for the base year sample is very high it is not 100% and, as we have noted above, there is a relationship between the sample coverage rate and the ability to detect doctor shopping events. Selection bias may also be a problem. Because both the base year sample and the five-year stability sample are opportunistic the pharmacies that provide data used in our analysis might be systematically different from those that do not; and different in ways that are correlated with doctor shopping behavior.

Figure 1. Base Year Sample Pharmacy Count (State) n = 35,311

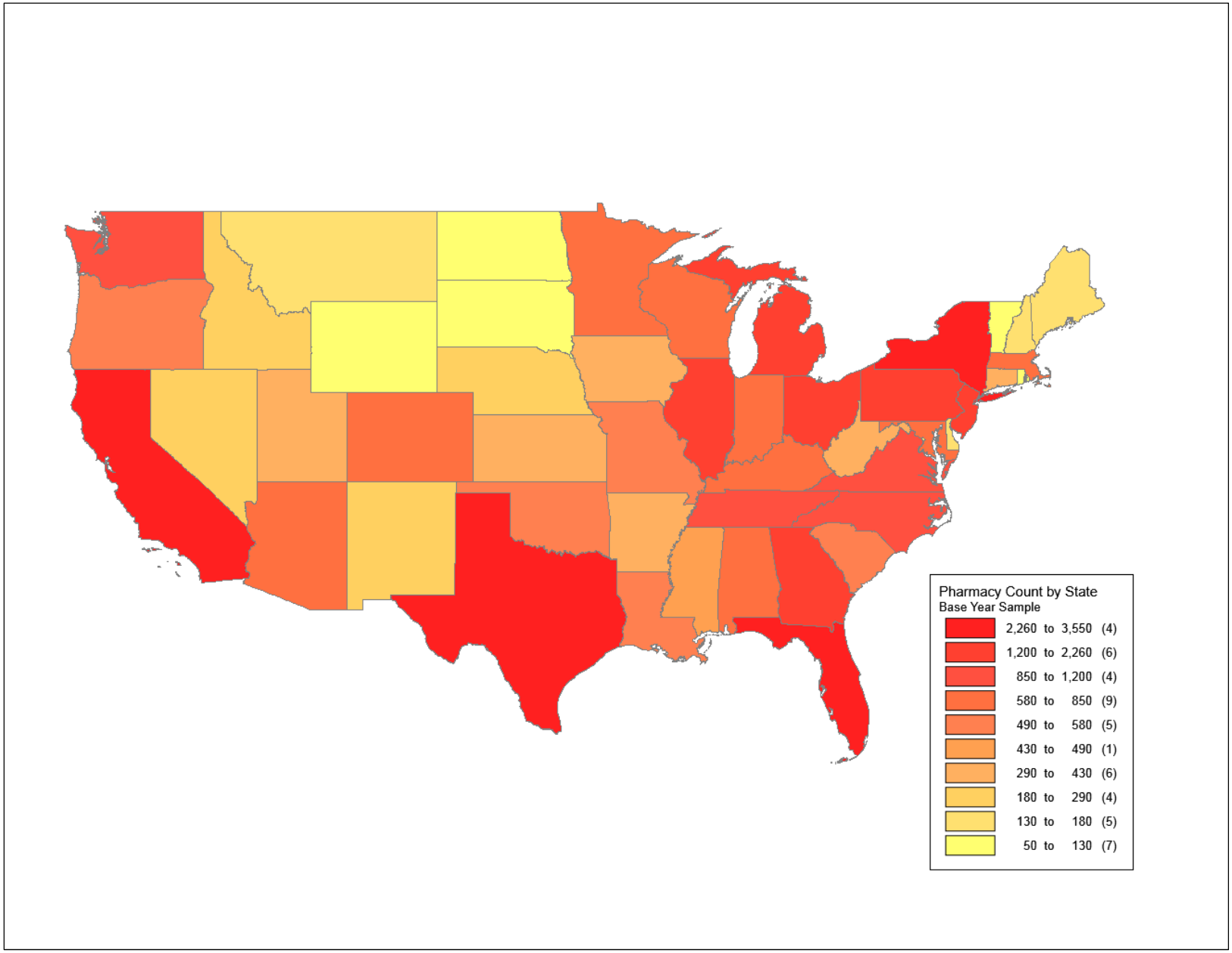


Figure 2. Base Year Sample Pharmacy Count (Zip-Three) n = 35,311

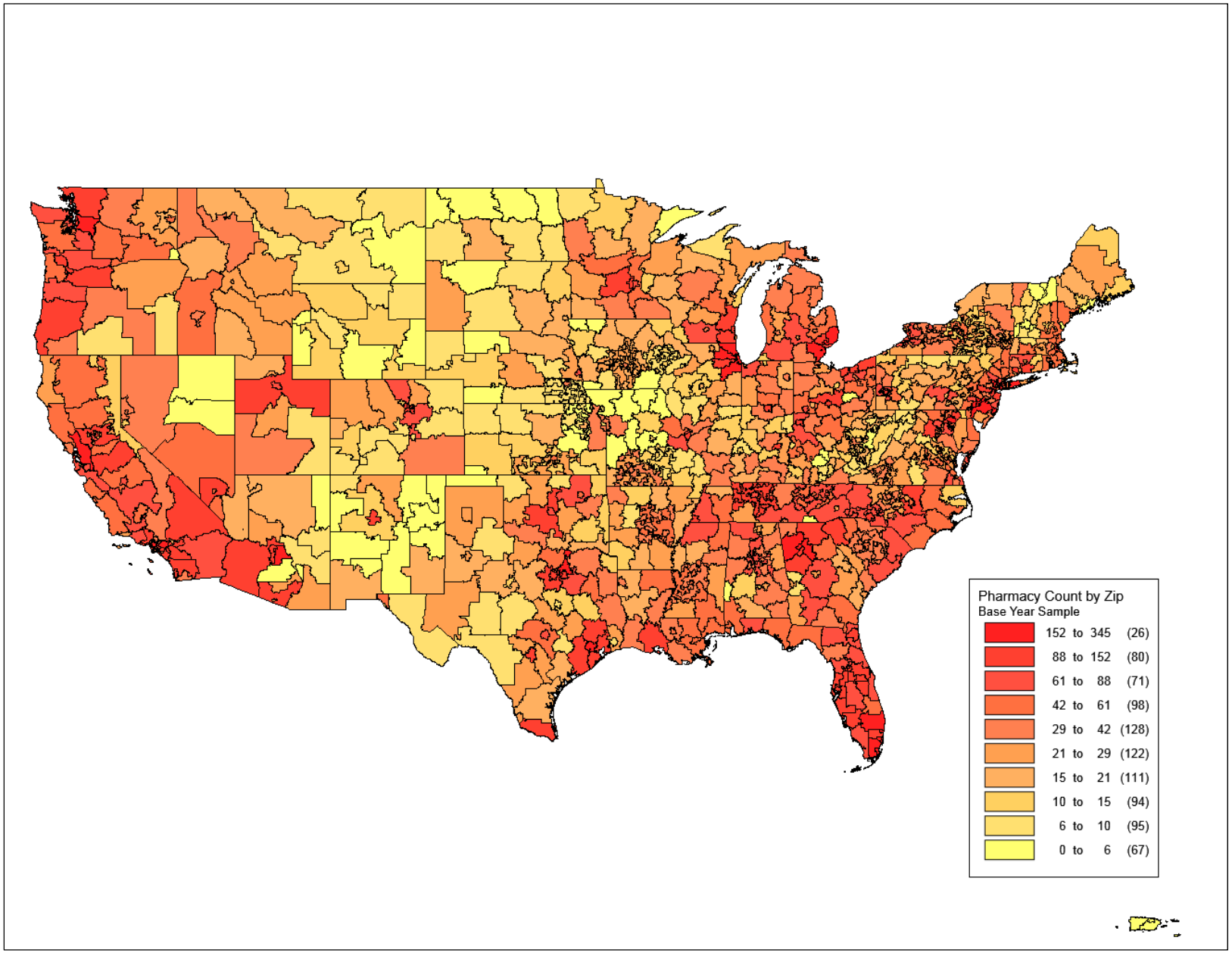


Figure 3. Base Year Sample Pharmacy Coverage Rate (State) n = 35,311

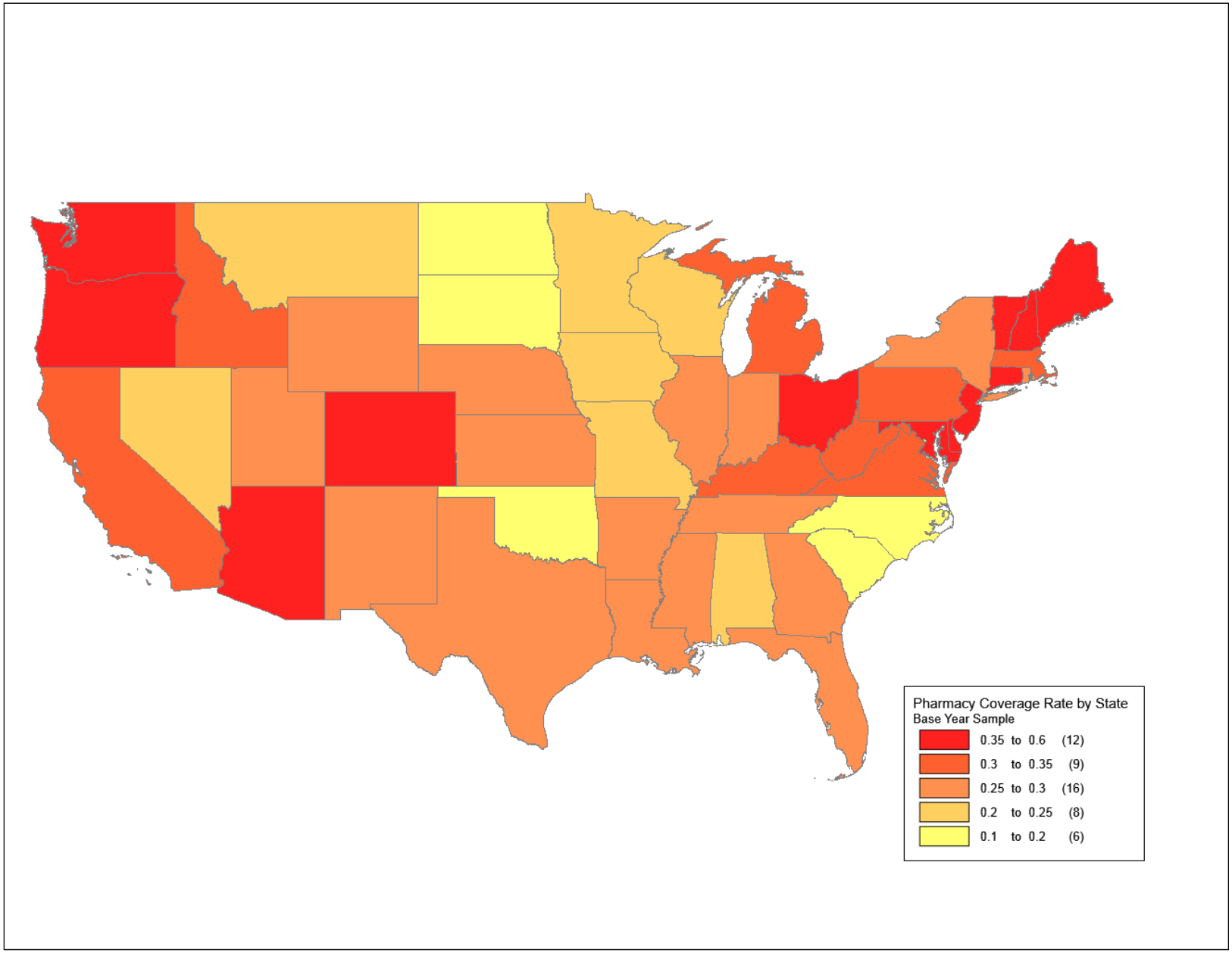


Figure 4. Base Year Sample Pharmacy Coverage Rate (Zip-Three) n = 35,311

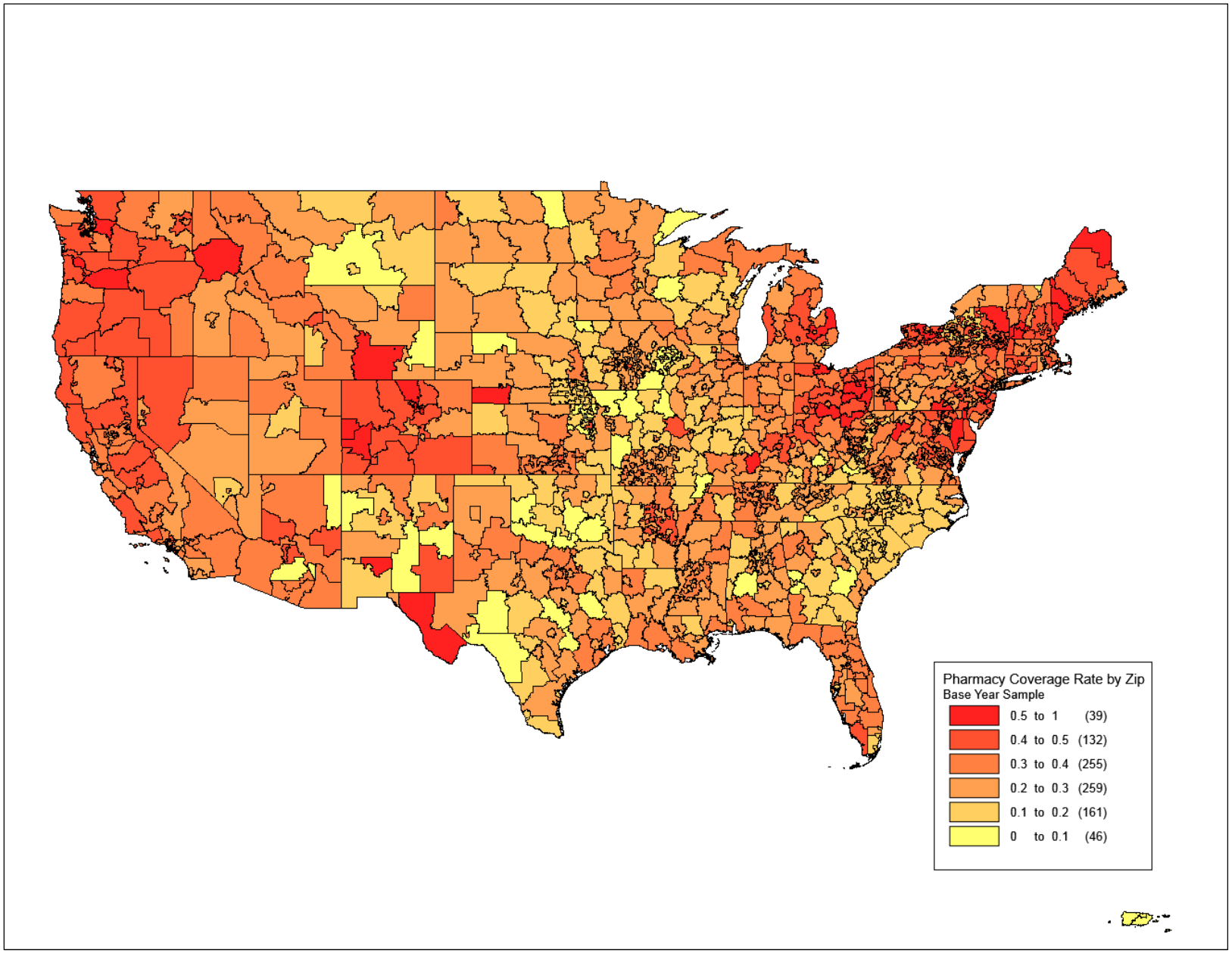


Figure 5. Five-Year Stability Sample Pharmacy Count (State) n = 8,954

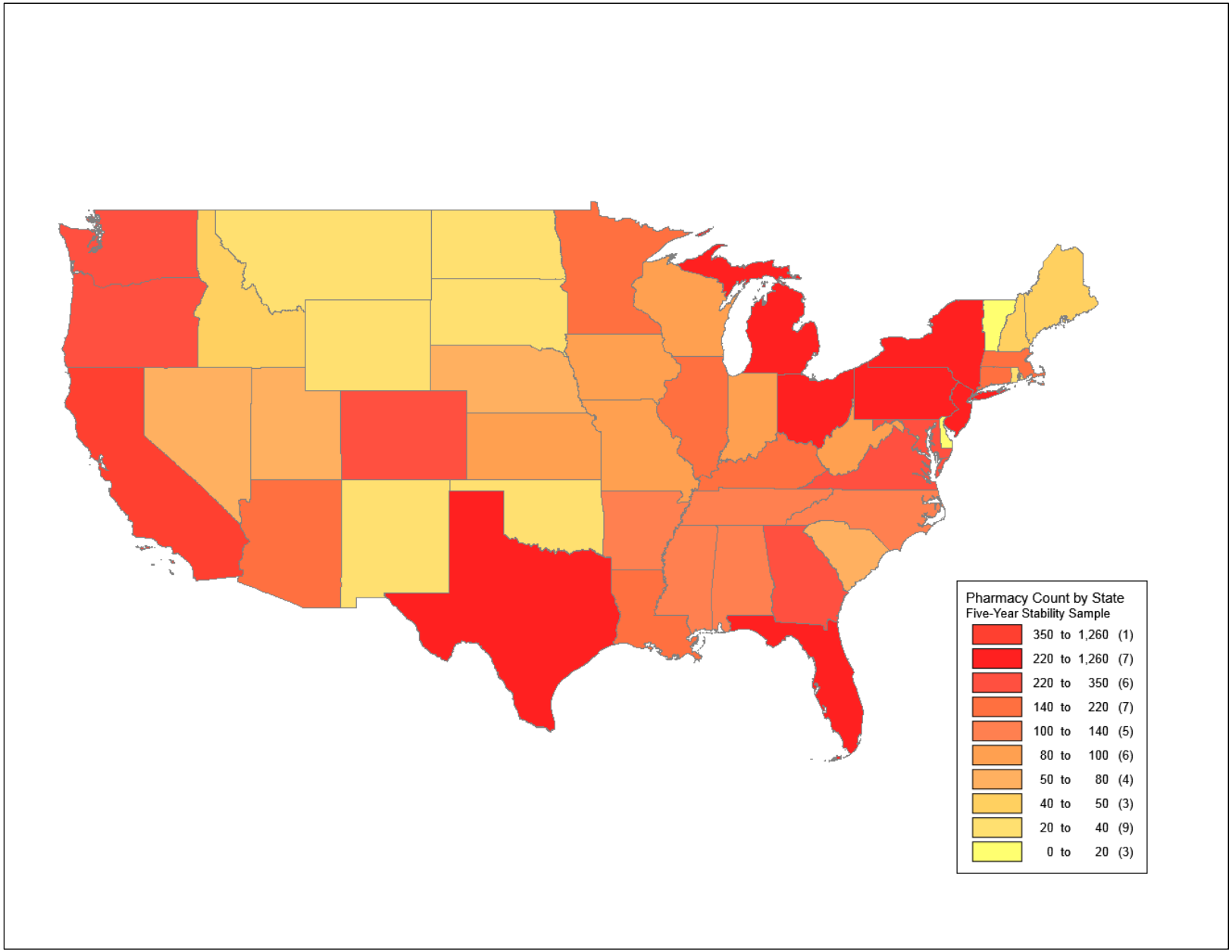


Figure 6. Five-Year Stability Sample Pharmacy Count (Zip-Three) n = 8,954

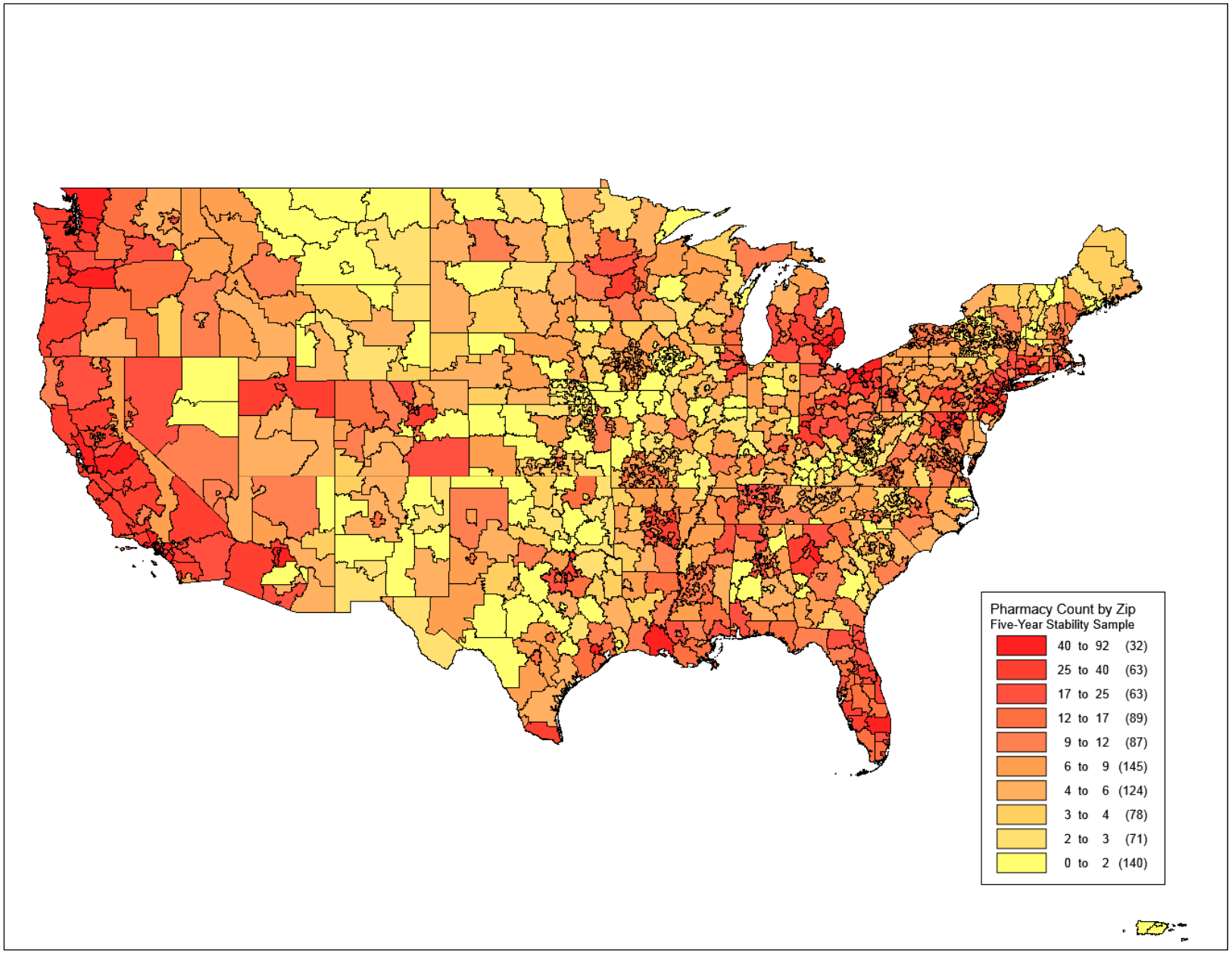


Figure 7. Five-Year Stability Sample Pharmacy Coverage Rate (State) n = 8,954

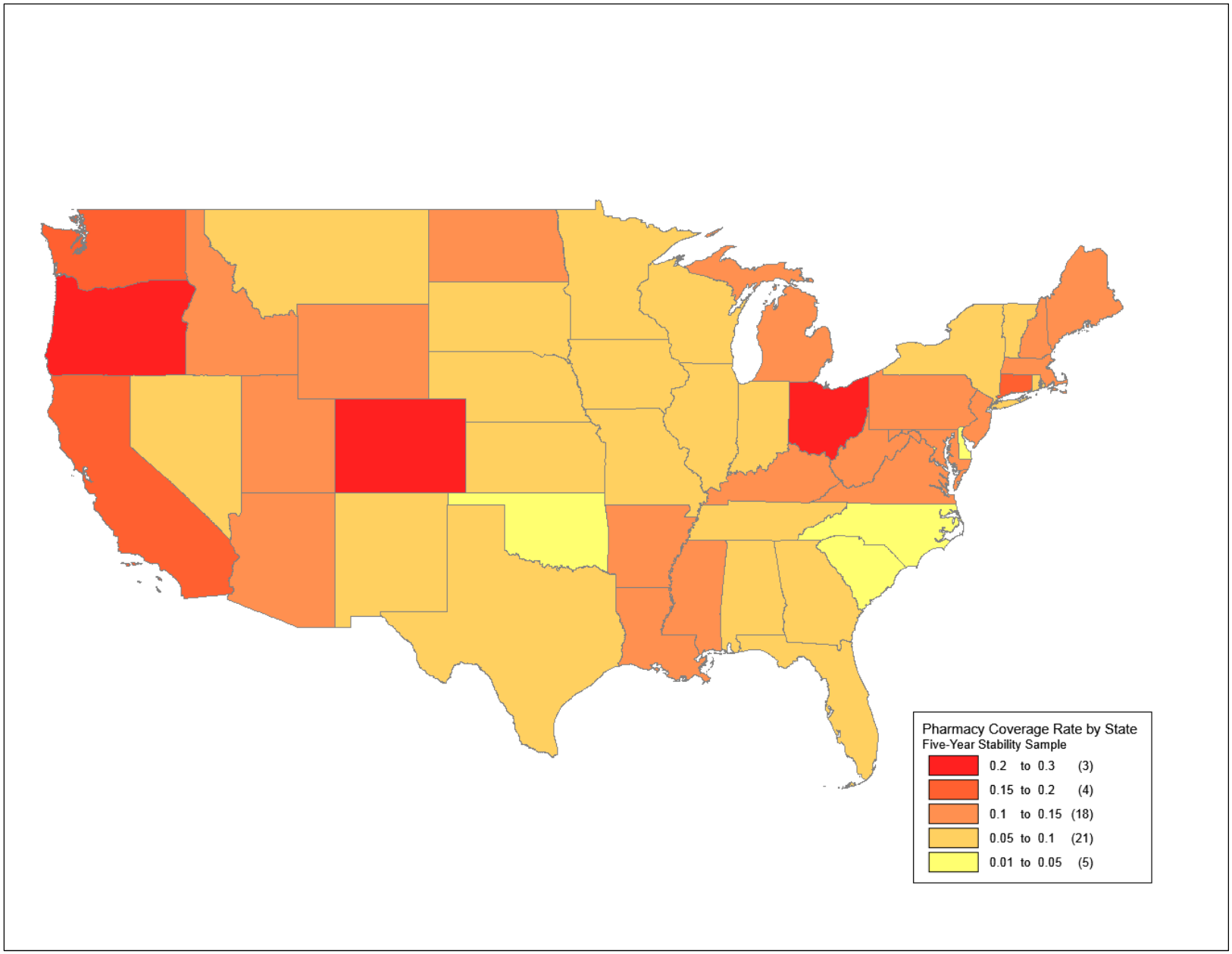
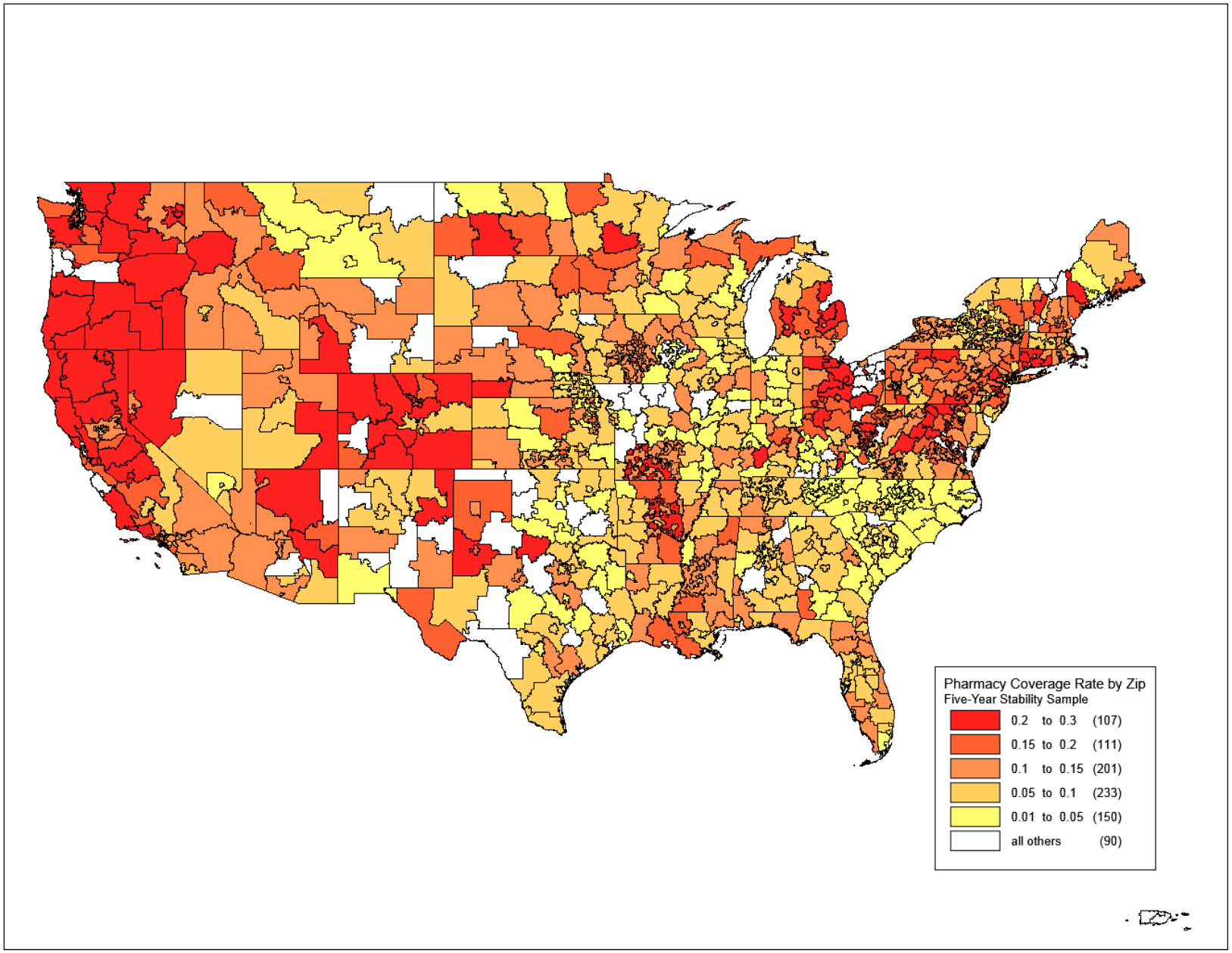


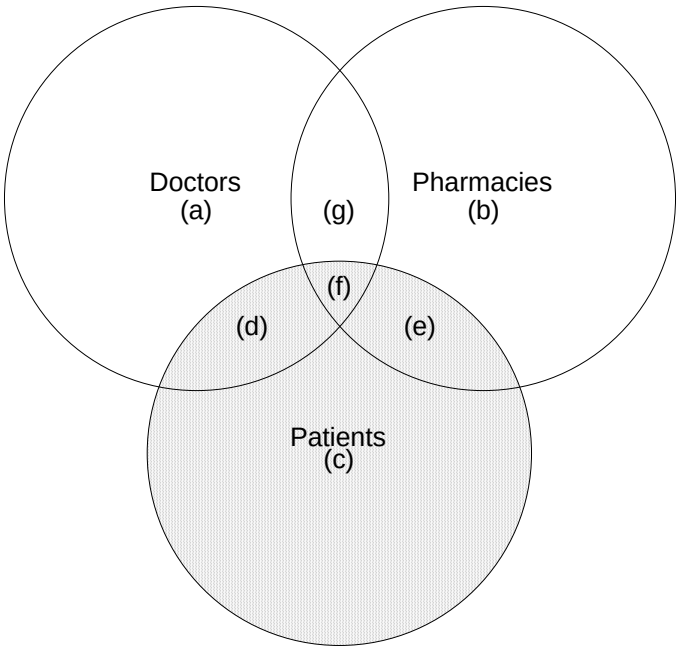
Figure 8. Five-Year Stability Sample Pharmacy Coverage Rate (Zip-Three) n = 8,954



Chapter 3. Sources of Diversion

There is a growing body of literature suggesting that while large-scale population studies such as the NSDUH indicate only a very small proportion of nonmedical prescription opioid users obtain their drugs from more than one physician or actually purchase the product from a dealer, friend, or acquaintance, these sources of supply are much more common among those who make contact with health care systems or who seek treatment for a SUD.[3] Cicero et al. (2011) report that in the Survey of Key Informants' Patients (SKIP), a national sample of about 100 treatment centers, more than 60% of prescription opioid users report dealers as their primary source. In the same report, a second sample collected in South Florida produced similar results. Other less common sources included doctors and theft. Findings of this kind beg a question as to where and how dealers acquire their prescription opioids for distribution. Some studies point to the importance of the pain clinic as a major supplier, noting that less strict controls on sales often exist there, and that patients are sometimes "sponsored" by a dealer who pays for medical costs with the ultimate objective of accumulating inventory (Rigg et al., 2010). More recently Rigg et al. (2012) have elaborated upon the mechanisms by which dealers acquire prescription opioids and in so doing cast light upon the interrelationships that exist among doctors, pharmacies, and patients. Each of the sets identified in Figure 9 can be regarded as a potential source of diversion.

Figure 9. Sources of Illicit Supply for Prescription Opioids



[3] See for example Davis and Johnson (2007); Inciardi et al. (2006); Inciardi et al. (2007); Inciardi and Cicero, 2009; Inciardi et al. (2009); Rigg et al. (2010).

- Doctors (a) become a source of supply when they knowingly write a prescription for an opioid analgesic that will eventually provide the basis for nonmedical use. The relatively liberal burden of proof required by many pain clinics can be indicative of criminal intent on the part of the prescribing physician.

- Any physical place that maintains a store of prescription opioids is a target for theft. And therefore pharmacies (b) are vulnerable in this regard—and often to their own employees. Pain clinics, which sometimes maintain an inventory of drugs on site, may be particularly susceptible to such behavior (g).

- Patients (c) who engage in doctor shopping are a third principal source of supply. Such patients may deliberately engage in transactions with doctors and pharmacies that are most likely to be complicit in their endeavors (d, e, and f).

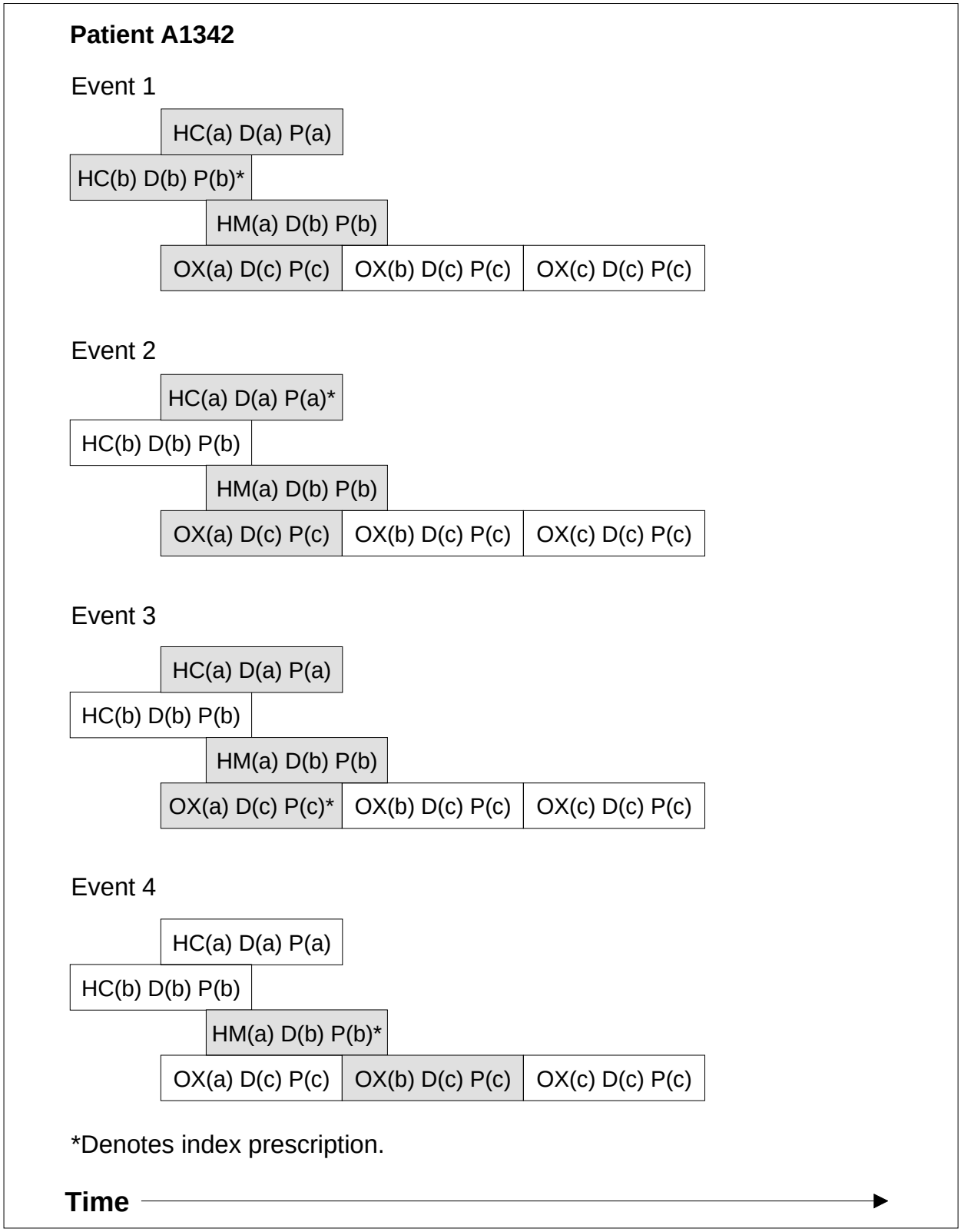
If we think of the diagram in Figure 9 now as being populated by prescriptions for opioid analgesics that are regarded with suspicion, some attributable to doctors who prescribe in an unusual manner, some attributable to pharmacies that dispense in an unusual manner, and some attributable to patients who consume in an unusual manner, then it becomes possible to consider all of the avenues that could be explored using the data maintained by IMS Health. Since doctors, pharmacies, patients, and prescriptions can be identified uniquely by the organization, prescriptions associated with each of the sets depicted in Figure 9 could in principle be estimated without duplication.

The present work focuses narrowly on patients and on doctor shopping as depicted in set (c) of Figure 9. Such behavior is normally defined operationally in terms of overlapping prescriptions of a similar kind written by some number of doctors and filled by some number of pharmacies (Cepeda et al., 2012a, 2012b; Pradel et al., 2004, 2009).

Thresholds for the numbers of doctors and pharmacies that must be involved are not defined based upon a "gold standard" or external point of validation. It is not ordinarily possible to conduct confirmatory case investigations. Instead these thresholds are defined based upon their statistical improbability and the extent to which prescriptions exceeding these thresholds appear suspicious for other reasons—perhaps because they involve cash payments rather than payments by a third party. Large numbers of cash transactions are often indicative of efforts to conceal illicit activity.

We rely upon a scheme involving thresholds as well and use it to form a taxonomy within which other indicators of doctor shopping may be considered. As such it moves substantially beyond prior efforts and allows the internal or "construct" validity of our approach to be examined. Figure 10 demonstrates the manner in which our typology is formed. We begin with data on all prescriptions dispensed over some arbitrarily defined period of time for a patient known to us only as "A1342."

Figure 10. Event Generation



In this example only three opioid analgesics are considered: hydrocodone (HC), hydromorphone (HM), and oxycodone (OX). In actual practice all opioid analgesics relevant to the study are represented in our analysis.[4] The prescriptions are identified as HC(a) and HC(b); HM(a); and OX(a), OX(b), and OX(c). Our contrivance includes three doctors, denoted D(a), D(b), and D(c), and three pharmacies, denoted P(a), P(b), and P(c). Thus HC(a) D(a) P(a) indicates that prescription (a) for hydrocodone was written by doctor (a) and filled by pharmacy (a). We use a forward searching algorithm to identify overlapping prescriptions and to populate cells in a 6 X 6 matrix representing the number of doctors and the number of pharmacies associated with a diversion event. The process of assigning prescriptions to cells in this matrix is described by reference to Figure 10 and illustrated below in Table 1:

- When HC(b) D(b) P(b) is taken as the "index prescription" it generates Event 1 comprising prescriptions {HC(b) D(b) P(b); HC(a) D(a) P(a); HM(a) D(b) P(b); OX(a) D(c) P(c)} and attributes information associated with this event (molecule name, number of milligrams, cash payment amount, third party payment amount, and location filled for each prescription) to cell 3,3 of Table 1. This is because three doctors, D(a), D(b) and D(c), and three pharmacies, P(a), P(b) and P(c), are involved. Prescriptions OX(b) D(c) P(c) and OX(c) D(c) P(c) are not included in Event 1 because they do not overlap with the index prescription.

- When HC(a) D(a) P(a) is taken as the index prescription it generates Event 2 comprising {HC(a) D(a) P(a); HM(a) D(b) P(b); OX(a) D(c) P(c)} and attributes information associated with this event to cell 3,3 of Table 1. As before, three doctors, D(a), D(b) and D(c), and three pharmacies, P(a), P(b) and P(c), are involved. Prescription HC(b) D(b) P(b) is not included in Event 2 because it begins prior to the index prescription. Prescriptions OX(b) D(c) P(c) and OX(c) D(c) P(c) are not included in Event 2 because they do not overlap with the index prescription.

- When OX(a) D(c) P(c) is taken as the index prescription it generates Event 3 comprising {OX(a) D(c) P(c); HC(a) D(a) P(a); HM(a) D(b) P(b)} and attributes information associated with the event to cell 3,3 of Table 1. Three doctors, D(a), D(b) and D(c), and three pharmacies, P(a), P(b) and P(c), are involved. Prescription HC(b) D(b) P(b) is not included in Event 3 because it begins prior to the index prescription. Prescriptions OX(b) D(c) P(c) and OX(c) D(c) P(c) are not included in Event 3 because they do not overlap with the index prescription.

- And when HM(a) D(b) P(b) is taken as the index prescription it generates Event 4 comprising {HM(a) D(b) P(b); OX(b) D(c) P(c)} and attributes information associated with the event to cell 2,2 of Table 1. Two doctors, D(b) and D(c), and two pharmacies, P(b) and P(c), are involved. Prescriptions {HC(a) D(a) P(a); HC(b) D(b) P(b); OX(a) D(c) P(c)} are not included in Event 4 because they begin prior to the index prescription. Prescription OX(c) D(c) P(c) is not included in Event 4 because it does not overlap with the index prescription.

[4] These include the following molecules and their brands: alfentanyl, buprenorphine, butorphanol tartrate, codeine, dihydrocodone, fentanyl, hydrocodone, hydromorphone, levomethadyl acetate, levomethadyl tartrate, meperidine, methadone hydrochloride, morphine, oxycodone, oxymorphone hydrochloride, pentazocine, propoxyphene, remifentanil hydrochloride, sufentanil citrate, tapentadol hydrochloride, and tramadol hydrochloride.

It is important to note that prescriptions can be and are represented more than once in the 6 X 6 matrix. This is by design. We want to examine the frequency associated with each cell because we will use points of discontinuity in the joint distribution of number of doctors and number of pharmacies to establish thresholds for drug diversion.

Table 1. Assignment of Diversion Event-Related Prescription Data to Cells for Number of Doctors and Number of Pharmacies

Pharmacies		1	2	3	4	5	6
Doctors							
Cell Measures	1						
Cell Measures	2		Event 4				
Cell Measures	3			Event 1 Event 2 Event 3			
Cell Measures	4						
Cell Measures	5						
Cell Measures	6						

It is possible—although unlikely—for an event to be generated which exceeds the range of the 6 X 6 matrix. When this occurs it is assigned to the row and column in which the maximum has been surpassed. Thus an event involving three doctors and seven pharmacies would be assigned to cell (3,6) and an event involving eight doctors and five pharmacies would be assigned to cell (6,5).

Chapter 4. Results for the Base Year

Table 2 provides information derived in the manner described in the preceding chapter for the 2012 base year sample. Referring to cell 2, 3 in Table 2 (two doctors and three pharmacies) the measures may be read thus: 0.1732% of all prescriptions for opioid analgesics involved two doctors and three pharmacies; 0.3146% of all milligrams associated with all prescriptions for opioid analgesics involved two doctors and three pharmacies; and 0.6268% of all cash expended on prescriptions for opioid analgesics involved two doctors and three pharmacies.

Table 2. Event Matrix Percent (Base Year, Duplicated Prescriptions)[5]

Pharmacies		1	2	3	4	5	6
Doctors							
Prescriptions	1	35.6299%	3.4808%	0.1678%	0.0088%	0.0009%	0.0001%
Milligrams		57.4543%	7.2671%	0.4861%	0.0285%	0.0025%	0.0004%
Cash		56.1081%	6.7304%	0.5224%	0.0506%	0.0098%	0.0023%
Cash/Total | Contingency		6.8246%	6.5808%	7.1465%	11.8680%	31.9071%	40.6688%
Prescriptions	2	10.5696%	2.9625%	0.1732%	0.0105%	0.0009%	0.0002%
Milligrams		12.3341%	3.6239%	0.3146%	0.0222%	0.0020%	0.0006%
Cash		9.7258%	5.9662%	0.6268%	0.0600%	0.0087%	0.0044%
Cash/Total | Contingency		5.5213%	11.7571%	13.4774%	17.4453%	31.8414%	71.1948%
Prescriptions	3	0.5629%	0.2934%	0.0990%	0.0095%	0.0009%	0.0002%
Milligrams		0.6558%	0.3569%	0.1237%	0.0149%	0.0017%	0.0003%
Cash		0.7040%	0.6469%	0.4496%	0.0590%	0.0087%	0.0017%
Cash/Total | Contingency		6.6738%	12.1341%	25.4383%	27.4920%	34.7532%	40.0214%
Prescriptions	4	0.0222%	0.0180%	0.0108%	0.0061%	0.0012%	0.0002%
Milligrams		0.0285%	0.0235%	0.0132%	0.0075%	0.0018%	0.0003%
Cash		0.0379%	0.0724%	0.0474%	0.0459%	0.0086%	0.0043%
Cash/Total | Contingency		7.7119%	19.3462%	24.3492%	32.7986%	29.7655%	51.4998%
Prescriptions	5	0.0009%	0.0008%	0.0009%	0.0009%	0.0009%	0.0003%
Milligrams		0.0026%	0.0013%	0.0010%	0.0009%	0.0012%	0.0004%
Cash		0.0027%	0.0033%	0.0019%	0.0072%	0.0079%	0.0024%
Cash/Total | Contingency		8.8174%	16.2750%	17.9575%	38.8045%	29.2235%	31.0807%
Prescriptions	6	0.0001%	0.0000%	0.0001%	0.0001%	0.0002%	0.0002%
Milligrams		0.0008%	0.0000%	0.0001%	0.0001%	0.0002%	0.0002%
Cash		0.0006%	0.0000%	0.0001%	0.0006%	0.0017%	0.0024%
Cash/Total | Contingency		18.5197%	0.0000%	25.0238%	51.2582%	35.7184%	42.5517%

[5] There is a large and growing body of literature on opioid analgesia relative to morphine and milligrams are expressed in terms of morphine-equivalence in all tables included in this report. (See for example Al-Edwan and Alghazawi, 2012; Anderson et al., 2003; Beaver et al.,1978; Bruera et al., 1998, 1996; Dunbar et al., 1996; Gordon et al., 1999; Hunt et al, 1999; Inturrisi, 2002; Kalso and Vainio, 1990; Pereira et al., 2001; Philip et al, 1997; Prommer, 2007; Ripamonti et al., 1998; Schulte et al., 2006; Shaiova, 2011; Trescot et al., 2008; Vallejo et al., 2011; Warra-Wolleat, et al., 2006). The conversion factors that we use here are based upon this research and were provided by the Centers for Disease Control (current as of October 2013).

Within this cell 13.4774% of the total payment amount was made in cash. The fact that the value of this measure (Cash/Total | Contingency) increases along the major diagonal lends credence to the notion that prescriptions associated with increasing numbers of doctors and increasing numbers of pharmacies may be viewed with increasing suspicion.

As noted above we make use of thresholds to define diversion. In this case we treat a zero in the first place to the left of the decimal for percent prescriptions in Table 2 as a threshold for the upper bound of diversion (a number less than 1% as indicated by the yellow and orange areas there); and a zero in the first place to the right of the decimal for percent prescriptions in Table 2 as a threshold for the lower bound of diversion (a number less than one tenth of 1% as indicated by the orange area there). The actual numbers associated with these cells are provided below in Table 3.

Table 3. Event Matrix Number (Base Year, Duplicated Prescriptions)

Pharmacies		1	2	3	4	5	6
Doctors							
Prescriptions	1	94,648,643	9,246,668	445,688	23,309	2,268	338
Milligrams		149,019,746,812	18,848,832,237	1,260,893,533	73,894,403	6,538,954	991,172
Cash		$516,980,359	$62,014,227	$4,813,432	$466,086	$90,462	$21,430
Cash/Prescription		$5	$7	$11	$20	$40	$63
Prescriptions	2	28,077,485	7,869,702	460,096	27,953	2,312	614
Milligrams		31,991,039,307	9,399,384,448	815,991,206	57,696,969	5,074,714	1,506,547
Cash		$89,613,180	$54,972,477	$5,775,513	$552,576	$80,162	$40,870
Cash/Prescription		$3	$7	$13	$20	$35	$67
Prescriptions	3	1,495,298	779,361	263,110	25,282	2,310	484
Milligrams		1,701,015,918	925,646,149	320,947,904	38,758,219	4,491,582	712,025
Cash		$6,486,331	$5,960,276	$4,142,218	$544,023	$80,017	$15,829
Cash/Prescription		$4	$8	$16	$22	$35	$33
Prescriptions	4	58,960	47,778	28,619	16,311	3,117	545
Milligrams		73,864,381	60,977,611	34,335,763	19,467,073	4,712,487	811,365
Cash		$349,037	$667,158	$437,103	$422,516	$78,864	$39,844
Cash/Prescription		$6	$14	$15	$26	$25	$73
Prescriptions	5	2,493	2,232	2,323	2,344	2,305	767
Milligrams		6,819,231	3,400,855	2,543,575	2,320,577	3,157,166	1,109,400
Cash		$24,717	$30,804	$17,511	$66,739	$72,488	$22,168
Cash/Prescription		$10	$14	$8	$28	$31	$29
Prescriptions	6	335	56	223	331	605	640
Milligrams		2,093,366	32,998	146,958	254,162	394,862	478,457
Cash		$5,576	$0	$962	$5,878	$15,791	$22,516
Cash/Prescription		$17	$0	$4	$18	$26	$35

These definitions are arbitrary but in the absence of an external validation criterion we are left with no alternative. They are justified by their statistical improbability, the observed increase in the percent cash on the major diagonal, and conventions adopted by other authors (Cepeda et al., 2012a, 2012b; Pradel et al., 2004, 2009). Note that in Table 3 we replace (Cash/Total | Contingency) with Cash/Prescription. This is adjustment necessary in order to place meaningful limits on the former measure.

Estimation of the prevalence of diversion requires that the prescriptions in the 6 X 6 matrix become unduplicated. To accomplish this we create unduplicated sets of observations involving what is depicted as the orange area in Table 2 and Table 3 (this provides the basis for a lower bound estimate), the yellow area depicted in Table 2 and Table 3 (which subsumes the orange area and provides the basis for an upper bound estimate), and the white area depicted in Table 2 and Table 3 (in which case "All" observations in the matrix become unduplicated).[6] The results of this exercise are presented in Table 4 and Table 5. They indicate an estimate of 0.0834% (involving 221,665 prescriptions) as a lower bound and an estimate of 1.2685% as an upper bound (involving 3,369,660 prescriptions).

Table 4. Event Matrix Percent (Base Year, Unduplicated Prescriptions)

		Lower	Upper	All
Prescriptions		0.0834%	1.2685%	48.3508%
Milligrams		0.1343%	1.8781%	72.2978%
Cash		0.3651%	2.8757%	72.2960%
Cash/Total | Contingency		17.2676%	10.0123%	7.0352%

Table 5. Event Matrix Number (Base Year, Unduplicated Prescriptions)

		Lower	Upper	All
Prescriptions		221,665	3,369,660	128,441,156
Milligrams		348,246,842	4,871,138,710	187,519,579,271
Cash		$3,364,138	$26,497,104	$666,136,384
Cash/Prescription		$15	$8	$5

It is also possible to produce total cost estimates based upon the material presented in the tables above. Referring to Table 5, $26,497,104 was expended in cash (using the upper bound estimate as our indicator). If, referring to Table 4, this constitutes 10.0123% of the total cost, then the total cost is given by: $26,497,104/.100123 = $264,645,526.

As part of this procedure we produce information on the distribution of drugs associated with the lower and upper bound estimates. These are presented in Table 6. Hydrocodone and oxycodone are predictably the most commonly observed drugs.[7]

[6] Measures based upon all data are provided for comparative purposes only.
[7] The lower bound estimates reported here are intended to provide a point of reference relative to the upper bound estimates. They allow the probability of doctor shopping behavior to be observed when thresholds are established in a very restrictive manner.

Table 6. Upper and Lower Bound Drug Distribution (Base Year, Unduplicated Prescriptions)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	39	1,657
BUPRENORPHINE	3,370	7,111,462	61,634	126,561,457	5,570,225	13,262,936,250
BUTORPHANOL_TARTRATE	1,027	338,941	8,848	2,511,525	227,428	68,166,282
CODEINE	5,755	2,106,588	96,409	31,953,082	3,565,265	1,376,685,426
DIHYDROCODONE	6	1,331	403	136,916	20,193	8,617,514
FENTANYL	10,724	1,163,408	161,335	17,493,051	4,677,052	555,750,612
HYDROCODONE	68,514	45,708,912	1,101,927	692,172,474	52,258,003	37,426,271,044
HYDROMORPHONE	7,405	13,210,278	102,285	165,620,332	2,343,852	4,614,642,144
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	45	182,729	2,960	10,979,696
MEPERIDINE	340	91,672	5,665	1,626,437	210,335	71,006,781
METHADONE_HCL	4,237	19,202,837	72,307	307,996,007	3,123,052	14,239,030,643
MORPHINE	12,667	36,971,740	210,987	597,962,265	7,568,627	23,497,688,887
OXYCODONE	76,127	183,998,065	1,096,993	2,409,421,705	32,745,973	78,148,938,758
OXYMORPHONE_HCL	4,302	21,642,261	56,273	264,614,106	1,075,432	5,007,469,152
PENTAZOCINE	111	112,959	1,836	2,091,962	99,503	135,914,463
PROPOXYPHENE	0	0	2	1,890	30	33,879
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	0	0	0	0	1	8
TAPENTADOL_HCL	1,390	3,656,277	26,248	67,156,451	698,135	1,863,751,047
TRAMADOL_HCL	25,691	12,930,112	366,466	183,636,320	14,255,051	7,231,695,030
Sum	221,665	348,246,842	3,369,660	4,871,138,710	128,441,156	187,519,579,272
Checksum	221,665	348,246,842	3,369,660	4,871,138,710	128,441,156	187,519,579,271

Chapter 5. Estimation of Diversion over Time

The Five-Year Stability Sample. In the preceding chapter we made use of a panel of pharmacies that reported on at least 95% of their prescriptions during calendar year 2012. It would be ideal if we could produce comparable results using a panel of pharmacies that reported in a similar manner over the entire 2008—2012 period. But this is not possible. When constraints are introduced to establish a panel that reports reliably over a five-year period much of the sample is lost to attrition. We address this problem by making use of a five-year stability sample and a base year sample. The former has a coverage rate of 12% and the latter a coverage rate of 30%.

To illustrate the effects of sample coverage on detection information from the five-year stability sample for 2012 is presented alongside information from the base year sample in Table 7 and Table 8. Referring to Table 7, a prescription diversion rate of .0346% is reported for cell 1,3 in the five-year stability sample for 2012, whereas a prescription diversion rate of .1678% is reported for the same cell of the base year sample. Referring to Table 8 the corresponding prescription counts are 91,985 and 455,688, respectively. These discrepancies are a consequence of differences in pharmacy coverage rates between the five-year stability and base year samples.

Table 7. Event Matrix Percent Comparison (2012, Duplicated)

		Five-Year Stability Sample			Base Year Sample		
Pharmacies		1	2	3	1	2	3
Doctors							
Prescriptions	1	34.0354%	1.3194%	0.0346%	35.6299%	3.4808%	0.1678%
Milligrams		35.0356%	1.6873%	0.0583%	57.4543%	7.2671%	0.4861%
Cash		32.4579%	1.3084%	0.0509%	56.1081%	6.7304%	0.5224%
Cash/3rd Party		11.7295%	10.6330%	11.3298%	6.8246%	6.5808%	7.1465%
Prescriptions	2	9.7466%	1.2393%	0.0405%	10.5696%	2.9625%	0.1732%
Milligrams		7.2846%	0.9455%	0.0438%	12.3341%	3.6239%	0.3146%
Cash		5.5193%	1.3406%	0.0695%	9.7258%	5.9662%	0.6268%
Cash/3rd Party		9.51%	18.7681%	20.5753%	5.5213%	11.7571%	13.4774%
Prescriptions	3	0.5398%	0.1261%	0.0363%	0.5629%	0.2934%	0.0990%
Milligrams		0.4107%	0.0984%	0.0259%	0.6558%	0.3569%	0.1237%
Cash		0.4084%	0.1406%	0.0786%	0.7040%	0.6469%	0.4496%
Cash/3rd Party		10.7545%	17.8066%	38.0391%	6.6738%	12.1341%	25.4383%
Prescriptions	4	0.0238%	0.0083%	0.0048%	0.0222%	0.0180%	0.0108%
Milligrams		0.0195%	0.0068%	0.0035%	0.0285%	0.0235%	0.0132%
Cash		0.0258%	0.0277%	0.0106%	0.0379%	0.0724%	0.0474%
Cash/3rd Party		12.6511%	37.1374%	38.1307%	7.7119%	19.3462%	24.3492%
Prescriptions	5	0.0008%	0.0004%	0.0006%	0.0009%	0.0008%	0.0009%
Milligrams		0.0008%	0.0004%	0.0005%	0.0026%	0.0013%	0.0010%
Cash		0.0017%	0.0017%	0.0025%	0.0027%	0.0033%	0.0019%
Cash/3rd Party		24.6534%	42.0735%	59.1882%	8.8174%	16.2750%	17.9575%
Prescriptions	6	0.0001%	0.0000%	0.0000%	0.0001%	0.0000%	0.0001%
Milligrams		0.0001%	0.0000%	0.0000%	0.0008%	0.0000%	0.0001%
Cash		0.0000%	0.0000%	0.0001%	0.0006%	0.0000%	0.0001%
Cash/3rd Party		4.6062%	14.7382%	56.5384%	18.5197%	0.0000%	25.0238%

Table 8. Event Matrix Number Comparison (2012, Duplicated)

		Five-Year Stability Sample			Base Year Sample		
Pharmacies		1	2	3	1	2	3
Doctors							
Prescriptions	1	90,412,848	3,504,990	91,985	94,648,643	9,246,668	445,688
Milligrams		141,168,379,211	6,798,656,877	235,087,330	149,019,746,812	18,848,832,237	1,260,893,533
Cash		$848,280,507	$34,195,113	$1,330,430	$516,980,359	$62,014,227	$4,813,432
Cash/Prescription		$9	$10	$14	$5	$7	$11
Prescriptions	2	25,891,160	3,292,046	107,653	28,077,485	7,869,702	460,096
Milligrams		29,351,600,926	3,809,829,124	176,332,391	31,991,039,307	9,399,384,448	815,991,206
Cash		$144,246,713	$35,036,027	$1,817,542	$89,613,180	$54,972,477	$5,775,513
Cash/Prescription		$6	$11	$17	$3	$7	$13
Prescriptions	3	1,433,835	335,061	96,481	1,495,298	779,361	263,110
Milligrams		1,654,880,604	396,300,498	104,357,521	1,701,015,918	925,646,149	320,947,904
Cash		$10,673,913	$3,673,869	$2,054,509	$6,486,331	$5,960,276	$4,142,218
Cash/Prescription		$7	$11	$21	$4	$8	$16
Prescriptions	4	63,111	21,994	12,874	58,960	47,778	28,619
Milligrams		78,514,288	27,538,797	14,097,504	73,864,381	60,977,611	34,335,763
Cash		$673,638	$724,953	$276,882	$349,037	$667,158	$437,103
Cash/Prescription		$11	$33	$22	$6	$14	$15
Prescriptions	5	2,228	1,160	1,559	2,493	2,232	2,323
Milligrams		3,037,770	1,732,895	1,853,635	6,819,231	3,400,855	2,543,575
Cash		$45,581	$45,528	$65,784	$24,717	$30,804	$17,511
Cash/Prescription		$20	$39	$42	$10	$14	$8
Prescriptions	6	149	113	121	335	56	223
Milligrams		283,551	116,413	62,750	2,093,366	32,998	146,958
Cash		$844	$1,187	$1,426	$5,576	$0	$962
Cash/Prescription		$6	$10	$12	$17	$0	$4

Table 9 and Table 10 provide five-year stability sample estimates for upper and lower bounds which may be compared to the base year estimates presented in Table 3 and Table 4.

Table 9. Event Matrix Percent
(Five-Year Stability Sample, 2012, Unduplicated Prescriptions)

		Lower	Upper	All
Prescriptions		0.0459%	0.7770%	43.3647%
Milligrams		0.0389%	0.6324%	41.3748%
Cash		0.0887%	0.7460%	38.3471%
Cash/Total | Contingency		23.4207%	13.4197%	11.8016%

Table 10. Event Matrix Number
(Five-Year Stability Sample, 2012, Unduplicated Prescriptions)

		Lower	Upper	All
Prescriptions		121,989	2,064,139	115,195,588
Milligrams		156,906,880	2,547,939,688	166,710,748,429
Cash		$2,317,299	$19,496,181	$1,002,192,287
Cash/Prescription		$19	$9	$9

Figure 11. Five-Year Stability Sample Trend (Prescriptions)

	Upper Bound Prescriptions (%)	Lower Bound Prescriptions (%)	Upper Bound Prescriptions (n)	Lower Bound Prescriptions (n)
2008	1.0727	0.1061	2,631,243	260,188
2009	0.9414	0.0753	2,378,257	190,174
2010	0.8288	0.0589	2,163,692	153,894
2011	0.7838	0.0520	2,059,699	136,731
2012	0.7770	0.0459	2,064,139	121,989

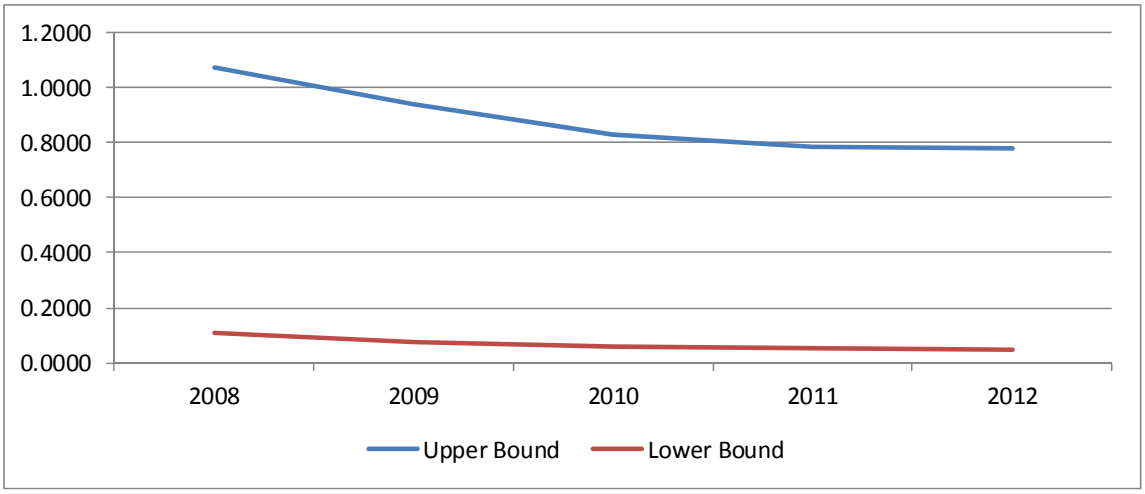
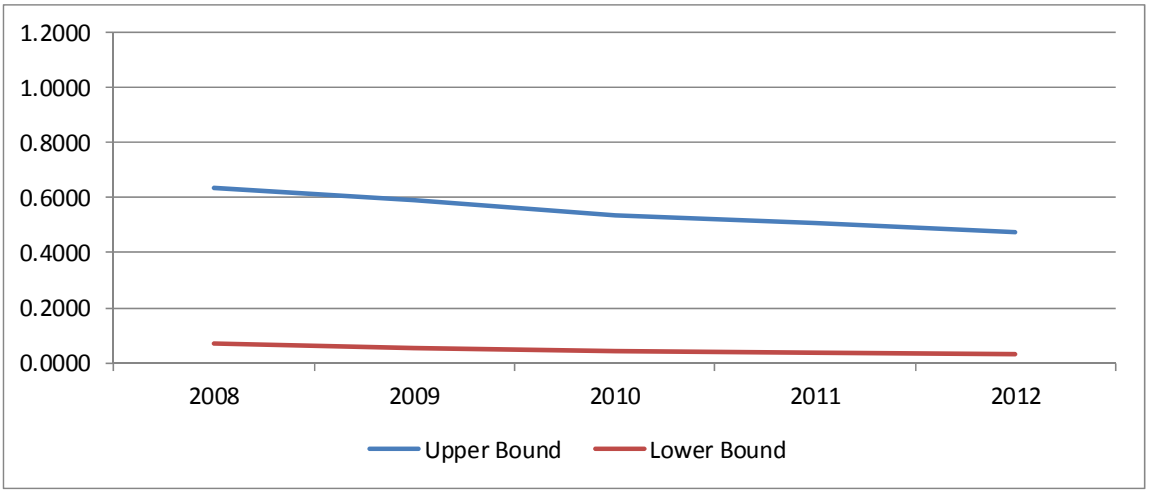


Figure 12. Five-Year Stability Sample Trend (Milligrams)

	Upper Bound Milligrams (%)	Lower Bound Milligrams (%)	Upper Bound Milligrams (n)	Lower Bound Milligrams (n)
2008	0.6374	0.0712	3,426,740,277	382,797,393
2009	0.5928	0.0533	3,187,313,908	286,719,869
2010	0.5361	0.0428	2,882,055,978	230,061,353
2011	0.5056	0.0372	2,718,143,561	200,162,035
2012	0.4739	0.0292	2,547,939,688	156,906,880



Estimates based on the five-year stability sample alone will be biased negatively but we present them above in Figure 11 and Figure 12 to provide a basis of comparison with the projected estimates that follow in the next section. The differences between the upper bound estimates and the lower bound estimates are large but this is to be expected given the manner in which thresholds have been defined.

Comprehensive information on the base year and five-year stability samples is provided in appendices to this document. Because we will attempt to examine patterns of diversion at the state and zip-three level separate sets of tables are provided for each. Given the mechanism of attribution that has been used there will be small differences between the two because not all zip-three areas are represented. There is no back-propagation (use of the base year sample to make estimates for prior years) in the appendices listed below. Thus:

Appendix A: presents material on duplicated prescriptions in which cell attribution has been made at the state level. Data are provided on both percent and number.

Appendix B: presents material on unduplicated prescriptions in which cell attribution has been made at the state level. Data are provided on both percent and number as well as on the distribution of drugs that is associated with each cell.

Appendix C: presents material on duplicated prescriptions in which cell attribution has been made at the zip-three level. Data are provided on both percent and number.

Appendix D: presents material on unduplicated prescriptions in which cell attribution has been made at the zip-three level. Data are provided on both percent and number as well as on the distribution of drugs that is associated with each cell.

Projection. As noted above we make use of information on change over time that is derived from the five-year stability sample which is rescaled using information on the base year sample to make projections for years prior to calendar 2012.[8] In practice the exercise makes use of hundreds of millions of prescription records and this is the level at which our calculations occur. But the principle itself is very simple and the operation can be performed using aggregate-level tables. If the base year sample rate of prescription diversion for the upper bound were 1% and the change in the five-year stability sample between 2012 and 2011 were 20% then the projected value for prescription diversion for 2011 would be .01 X 1.20 X 100 = 1.2%. Estimates made using this approach appear in Figure 13 and Figure 14.

[8] We effectively treat estimates made using the base year sample as unbiased for this purpose. Earlier we demonstrated how the loss of coverage that occurs when a five-year stability sample is drawn affects our ability to detect diversion. In fact the problem may be present in the base year sample as well although we can find no evidence of this (the rate of pharmacy coverage is uncorrelated with the rate of diversion there).

Figure 13. Projected Trend (Prescriptions)

	Upper Bound Prescriptions (%)	Lower Bound Prescriptions (%)	Upper Bound Prescriptions (n)	Lower Bound Prescriptions (n)
2008	1.7512	0.1927	4,295,445	472,782
2009	1.5368	0.1368	3,882,450	345,561
2010	1.3530	0.1071	3,532,179	279,637
2011	1.2795	0.0945	3,362,412	248,451
2012	1.2685	0.0834	3,369,660	221,665

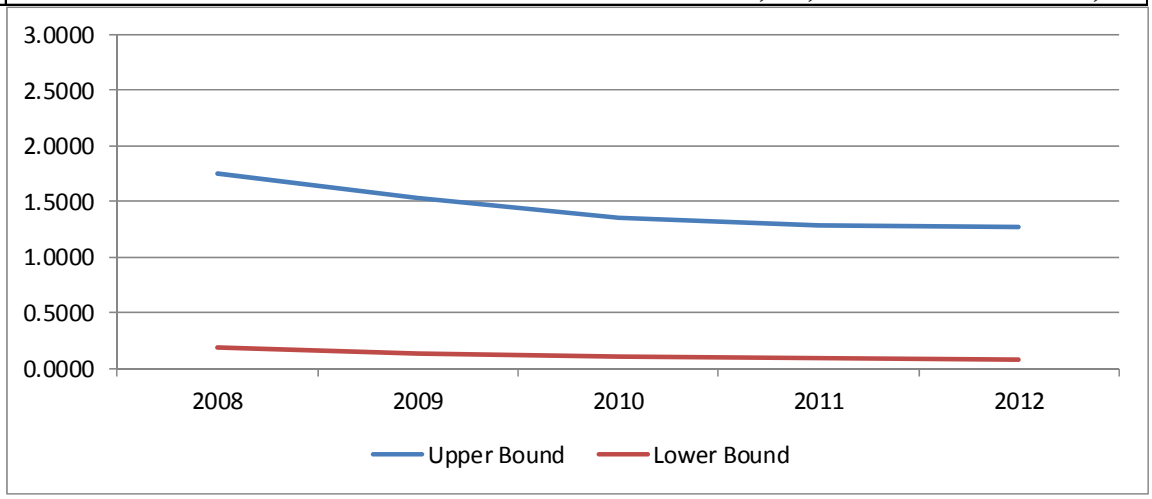


Figure 14. Projected Trend (Milligrams)

	Upper Bound Milligrams (%)	Lower Bound Milligrams (%)	Upper Bound Milligrams (n)	Lower Bound Milligrams (n)
2008	2.9492	0.3825	6,551,225,405	849,599,352
2009	2.7431	0.2865	6,093,491,236	636,360,172
2010	2.4804	0.2299	5,509,900,609	510,609,476
2011	2.3393	0.2000	5,196,533,648	444,249,460
2012	2.1928	0.1568	4,871,138,710	348,246,842

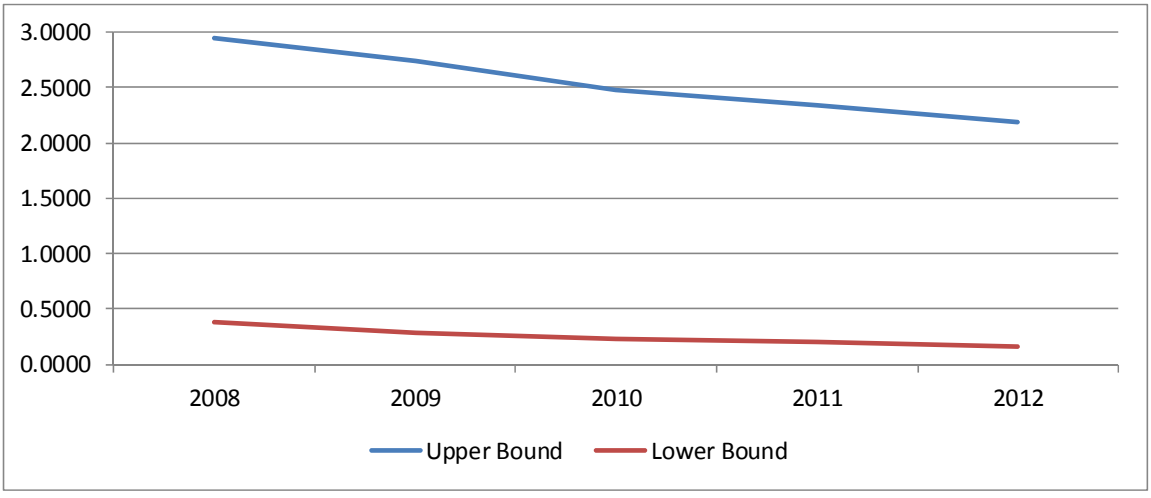


Figure 13 indicates a sustained downward trend in the proportion and number of prescriptions diverted. This trend is evident in Figure 14 for the proportion and number of morphine-equivalent milligrams diverted as well. The differences between the upper bound estimates and the lower bound estimates are large but this is to be expected given the manner in which thresholds have been defined. The upper bound estimates are not inconsistent with other estimates that have been reported in the research literature (Cepeda et al., 2012a, 2012b; Pradel et al., 2004, 2009).

Comprehensive information on projections is provided in appendices to this document. Because we will attempt to examine patterns of diversion at the state and zip-three level separate sets of tables are provided for each. Back-propagation for years prior to 2012 is applied here. Thus:

Appendix E: presents material on duplicated prescriptions in which cell attribution has been made at the state level. Data are provided on both percent and number.

Appendix F: presents material on unduplicated prescriptions in which cell attribution has been made at the state level. Data are provided on both percent and number as well as on the distribution of drugs that is associated with each cell.

Appendix G: presents material on duplicated prescriptions in which cell attribution has been made at the zip-three level. Data are provided on both percent and number.

Appendix H: presents material on unduplicated prescriptions in which cell attribution has been made at the zip-three level. Data are provided on both percent and number as well as on the distribution of drugs that is associated with each cell.

Chapter 6. Estimation of Diversion across Space

Upper bound estimates of percent prescriptions diverted by state in 2008 and 2012 (Figure 15 and Figure 16) and for percent morphine-equivalent milligrams diverted by state in 2008 and 2012 (Figure 17 and Figure 18) are provided below. Corresponding estimates for zip-three areas are provided in Figure 19 and Figure 20, and Figure 21 and Figure 22.

Given the manner in which the estimates have been derived the state level estimates are essentially projections based upon the pharmacies that have reported within the zip-three areas that they comprise. There are cases in which no zip-three level estimates are presented: either because there were no pharmacies represented in a zip-three area for the base year; or because when back-propagating the tables for 2008-2011, no pharmacies were represented for a particular year in the five-year stability sample; or, because of variability in the data, our calculations resulted in values that were judged to be implausible.

Since the estimates do not have formal statistical properties the findings presented in the maps can best be assessed by examining simultaneously information related to pharmacy coverage provided earlier on in the report in Chapter 2: Characteristics of the Data. The fact that the downward trend in doctor shopping that we observe in our national estimates is driven largely by areas with high rates of coverage in the base year as well as high rates of coverage in the five-year stability sample suggests that the finding is both real and widespread. In any case:

Appendix I: presents material on percent prescriptions diverted as measured at the upper bound in which cell attribution has been made for each state for each year (2008-2012).

Appendix J: presents material on percent morphine-equivalent milligrams diverted as measured at the upper bound in which cell attribution has been made for each state for each year (2008-2012).

Appendix K: presents material on percent prescriptions diverted as measured at the upper bound in which cell attribution has been made for each zip-three area for each year (2008-2012).

Appendix L: presents material on percent morphine-equivalent milligrams diverted as measured at the upper bound in which cell attribution has been made for each zip-three area for each year (2008-2012).

Figure 15. Percent Prescriptions Diverted by State (2008)

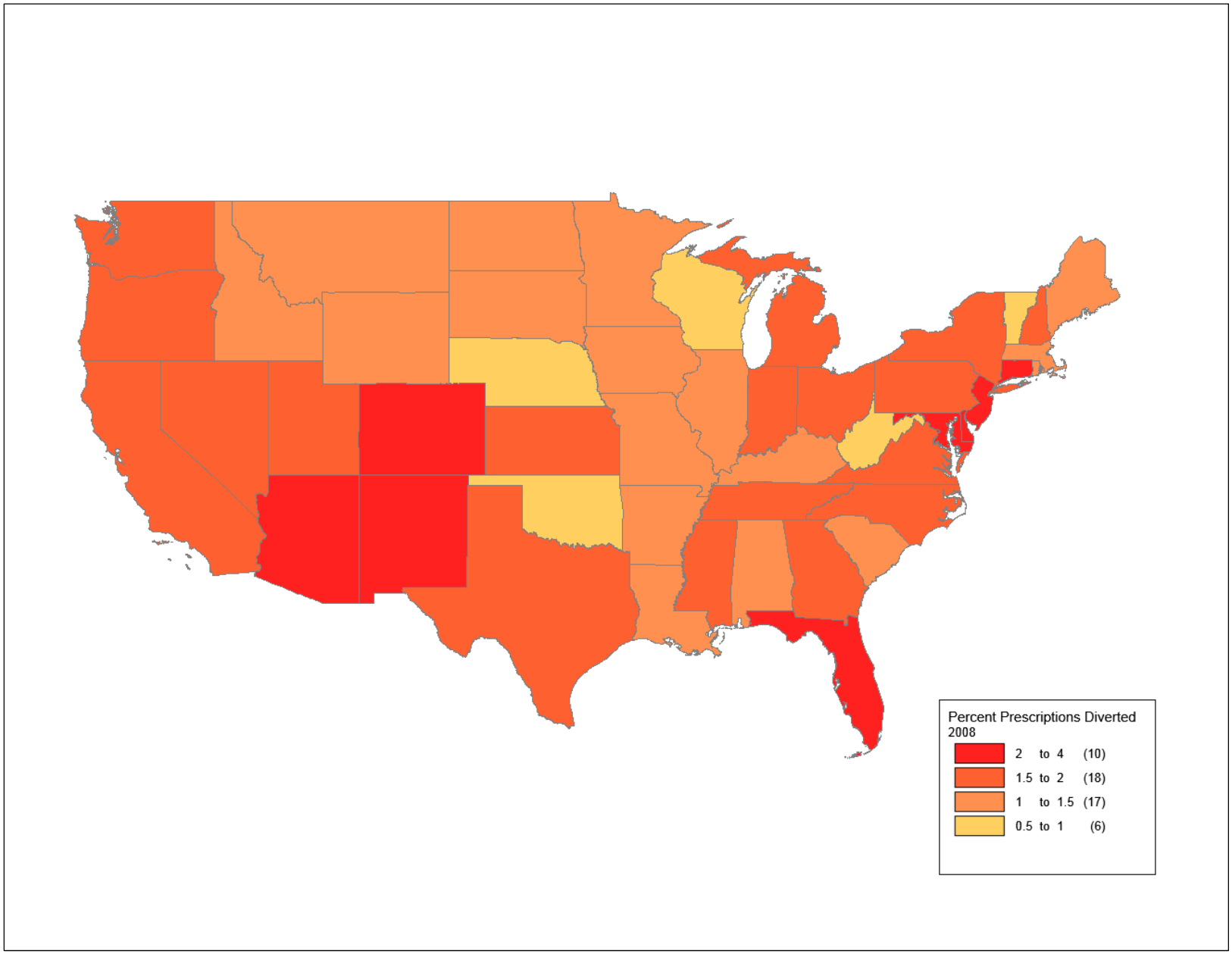
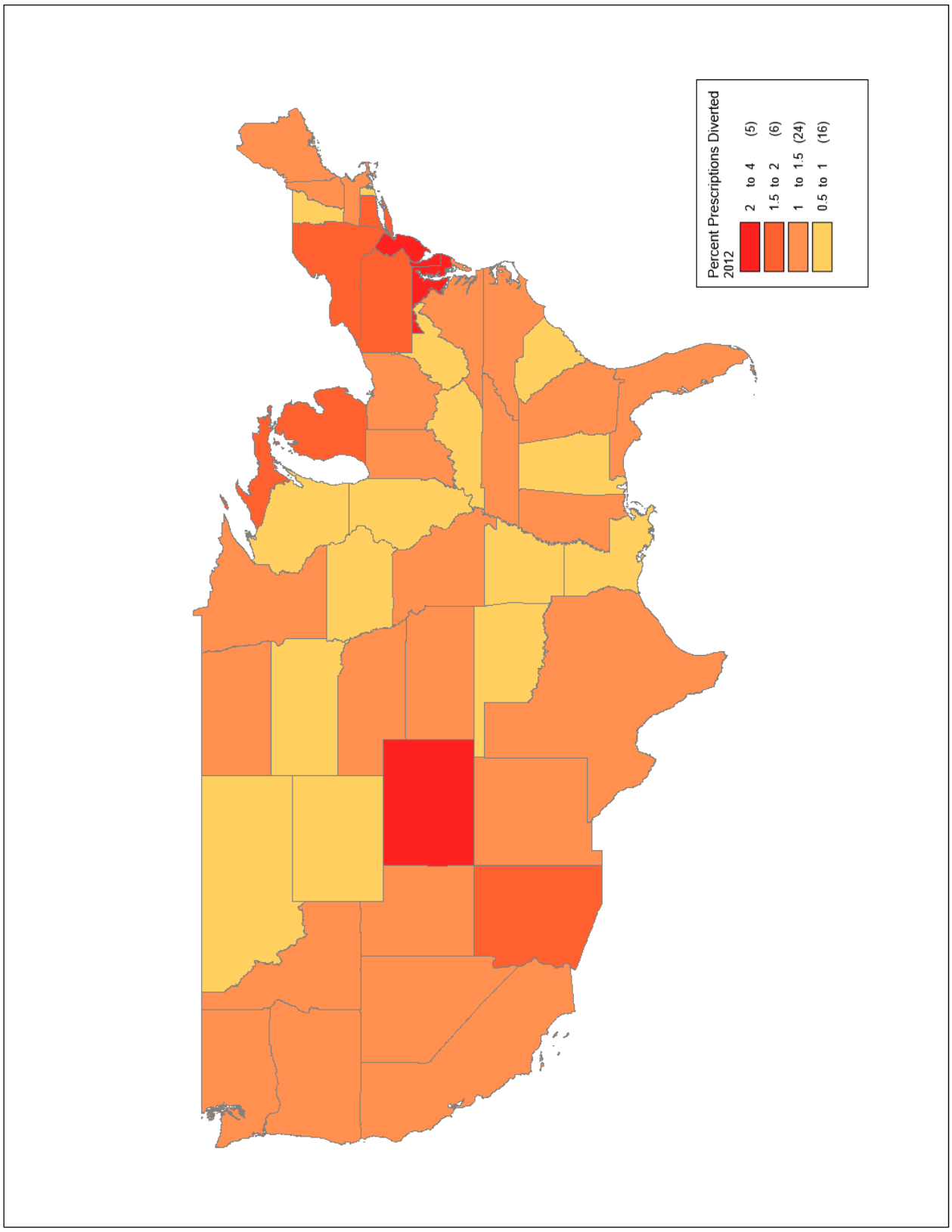


Figure 16. Percent Prescriptions Diverted by State (2012)



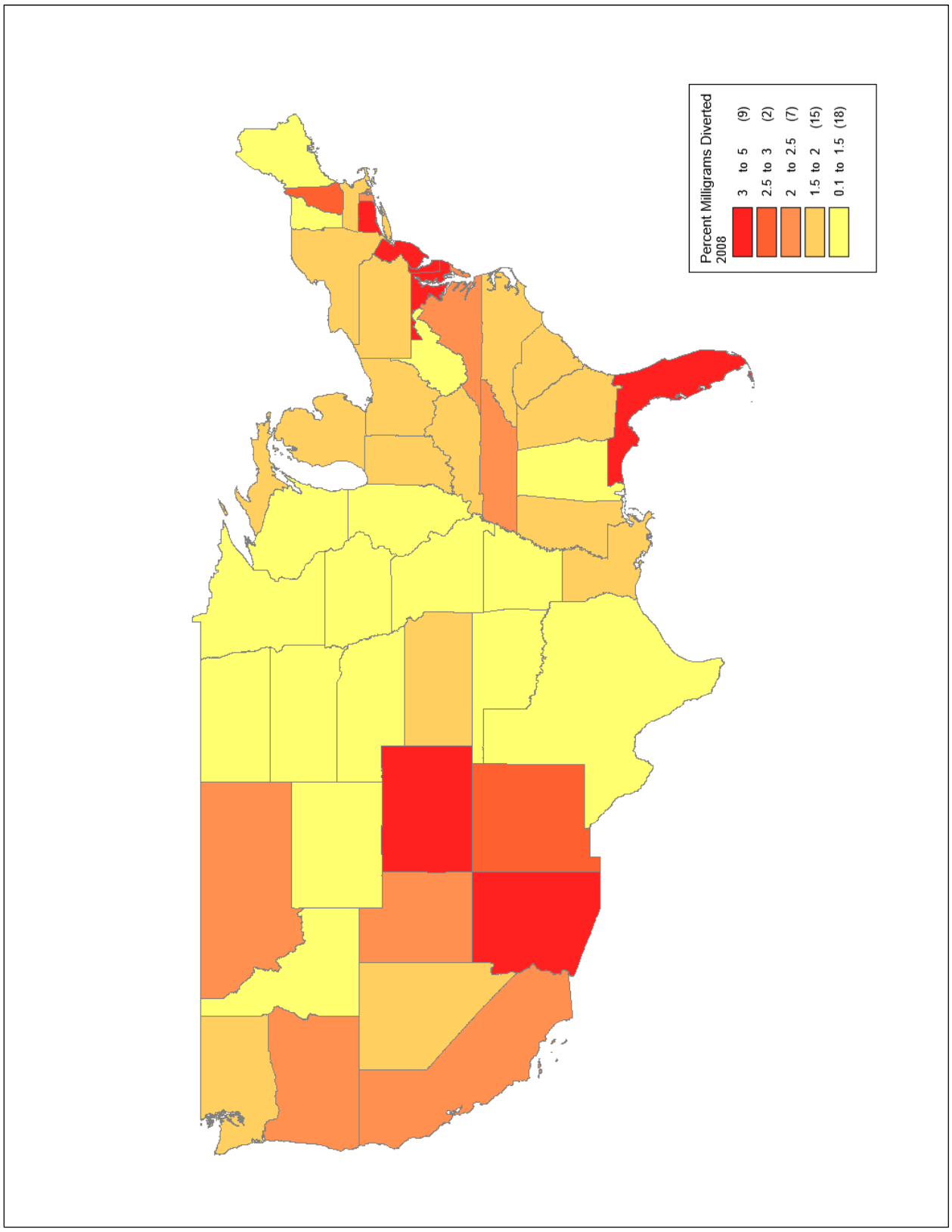


Figure 17. Percent Milligrams Diverted by State (2008)

Figure 18. Percent Milligrams Diverted by State (2012)

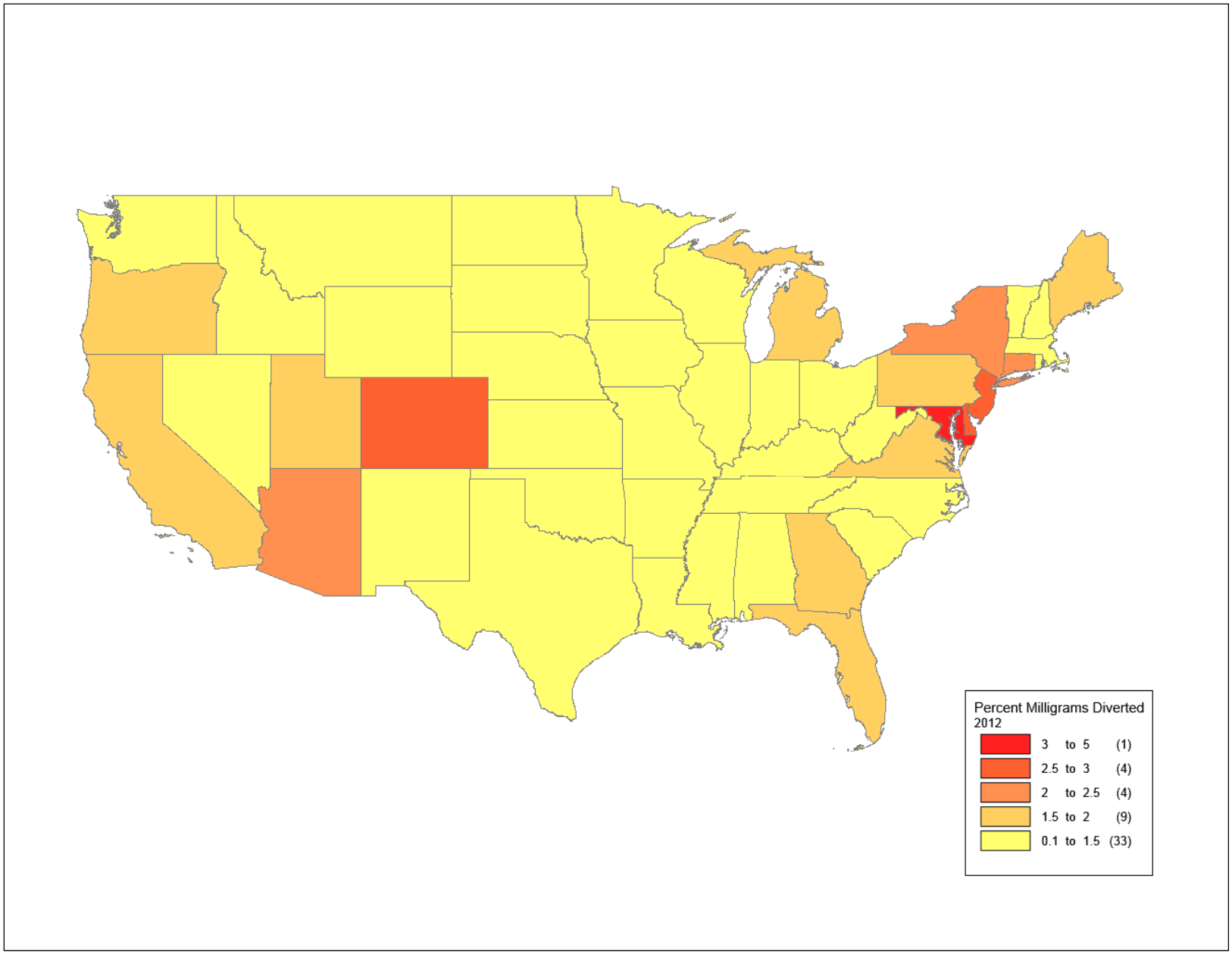


Figure 19. Percent Prescriptions Diverted by Zip-Three (2008)

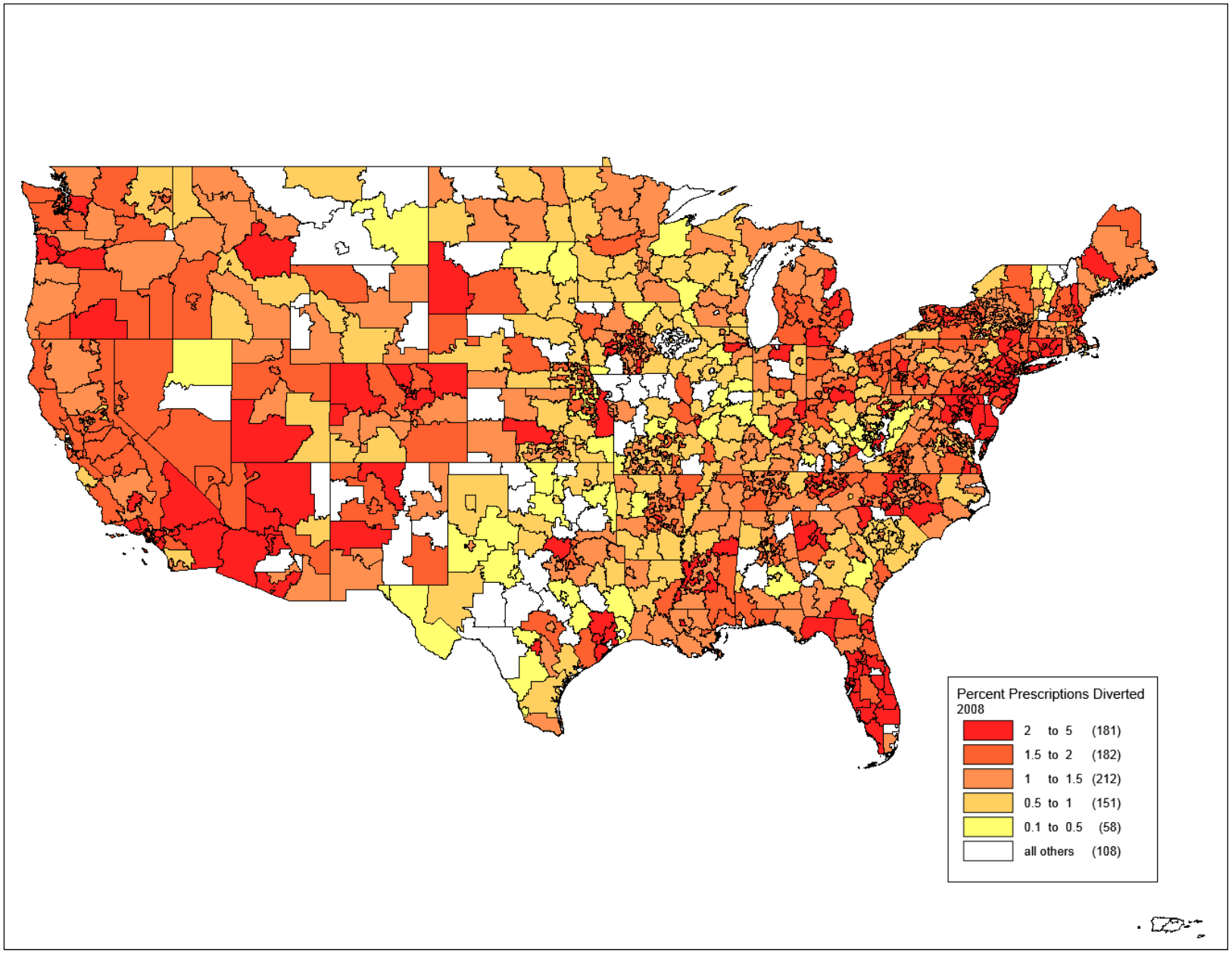


Figure 20. Percent Prescriptions Diverted by Zip-Three (2012)

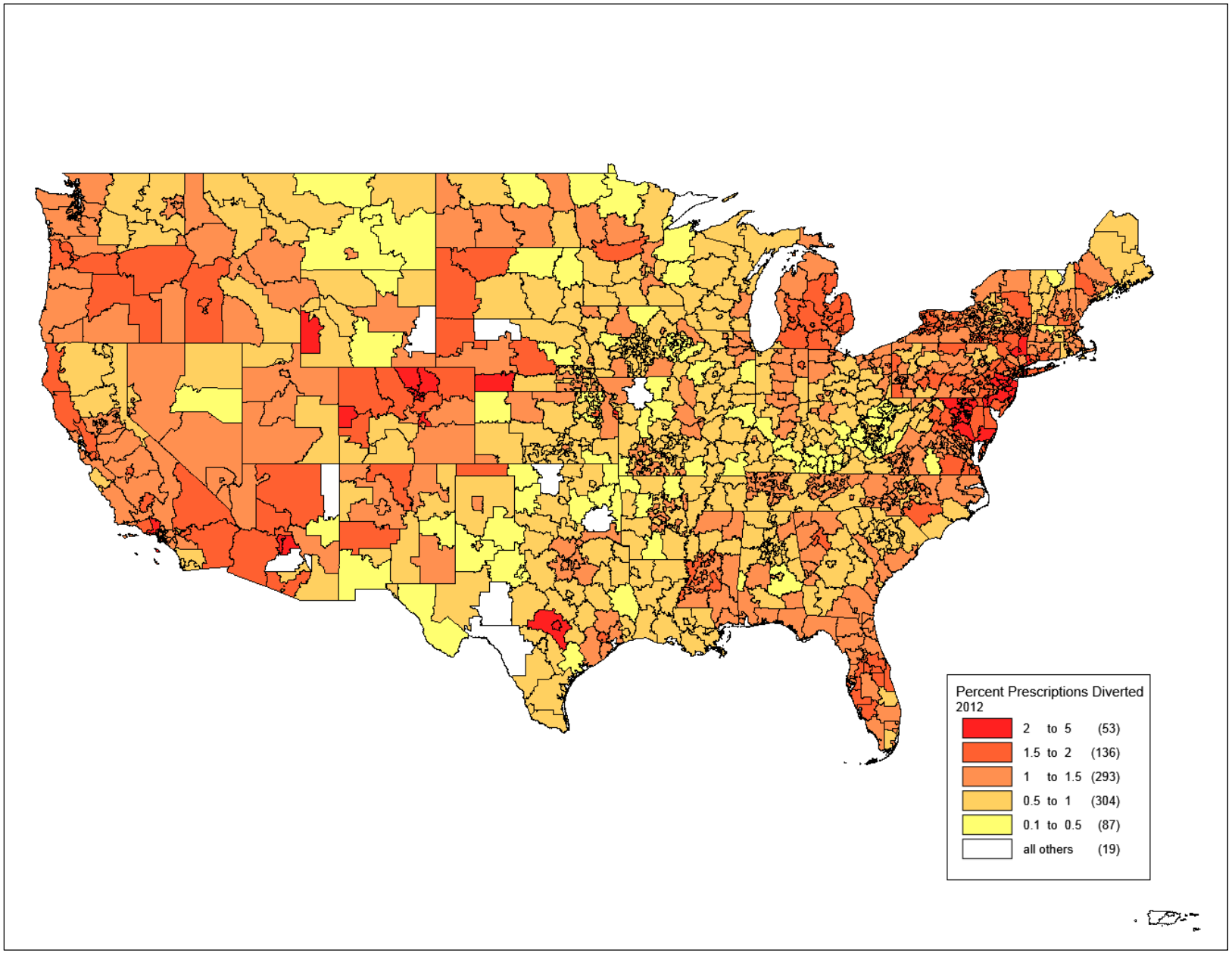


Figure 21. Percent Milligrams Diverted by Zip-Three (2008)

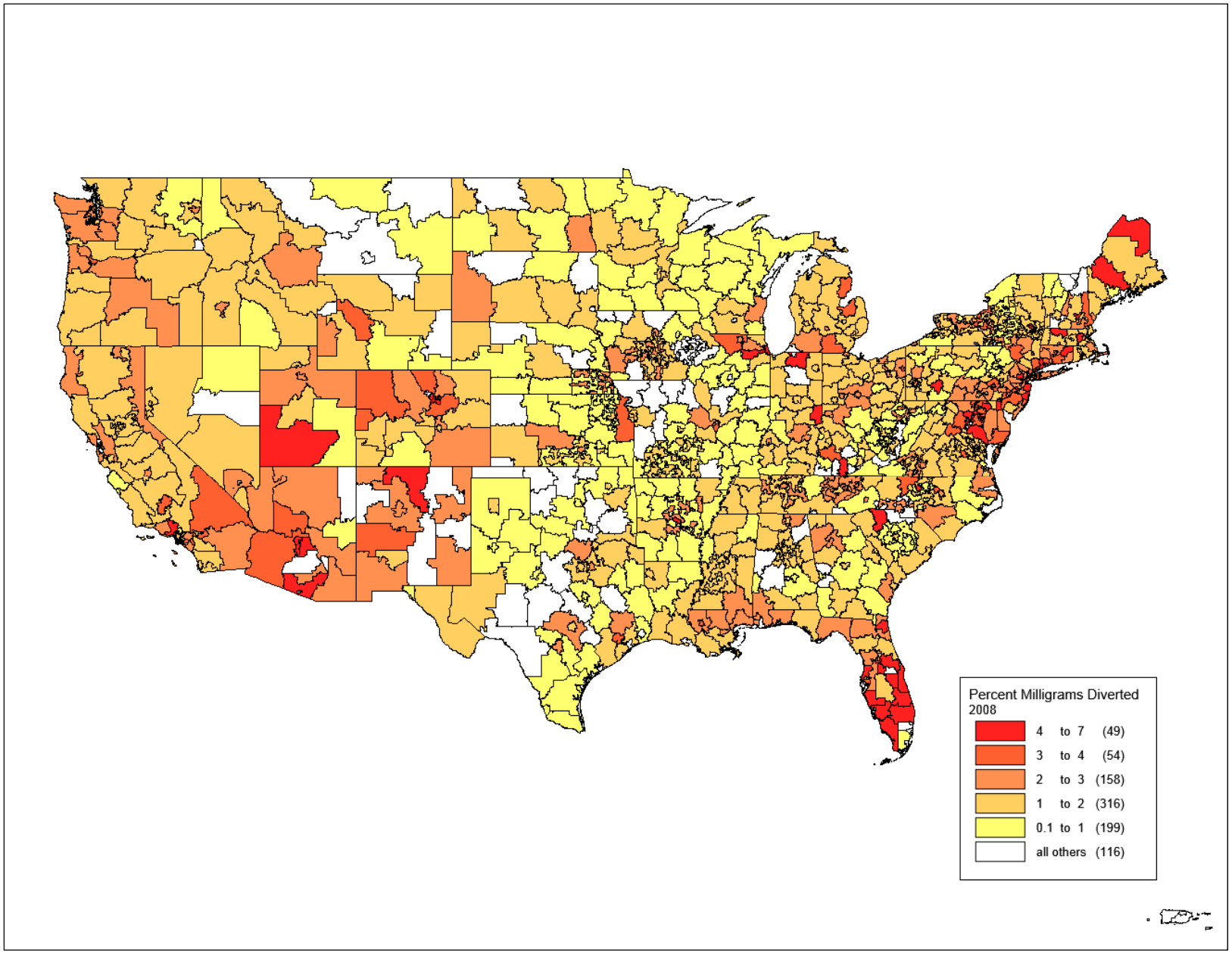
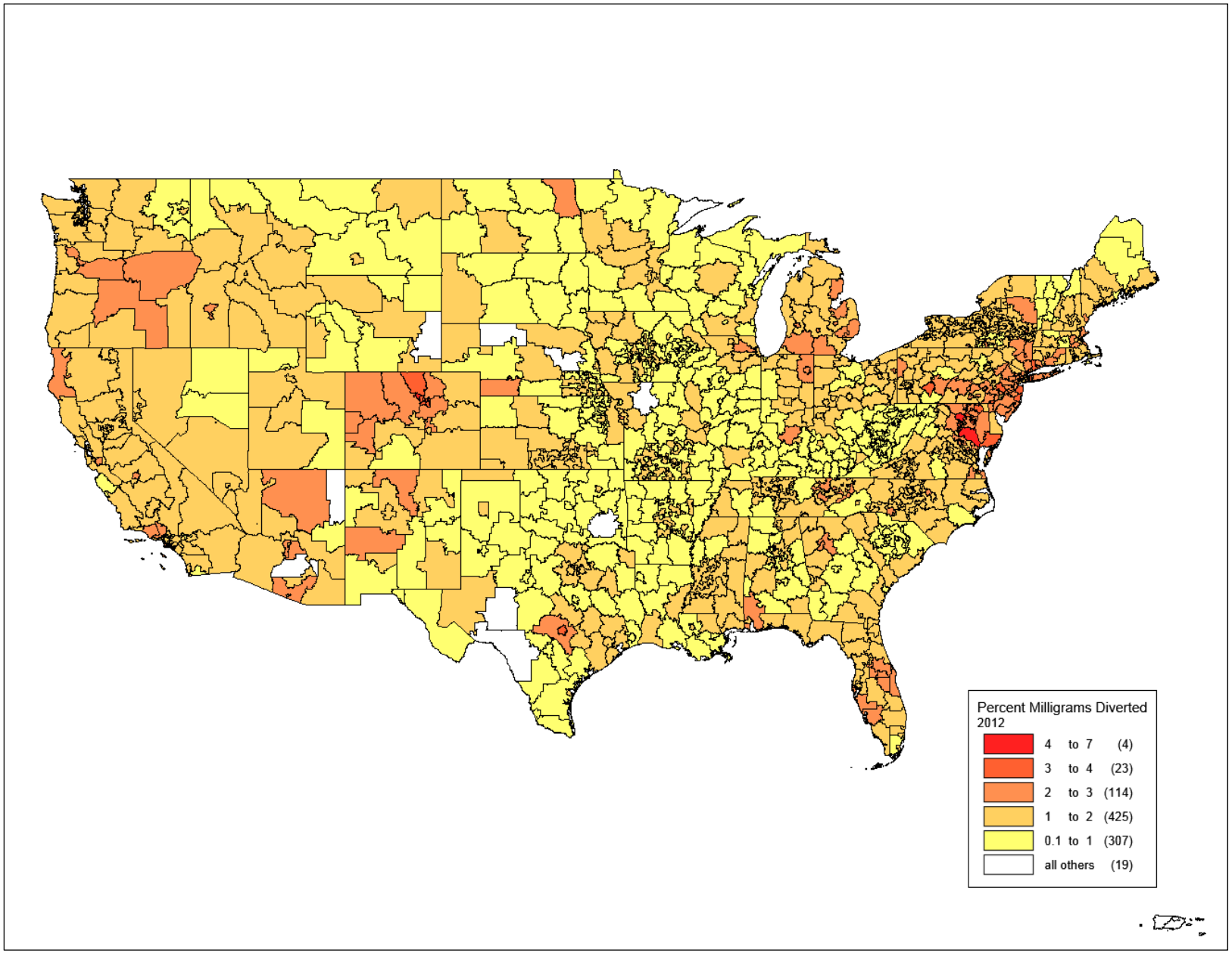


Figure 22. Percent Milligrams Diverted by Zip-Three (2012)



Chapter 7. Discussion

Sustained declines in the proportion and number of prescriptions diverted and in the proportion and number of morphine-equivalent milligrams diverted have been described in preceding chapters. When this information is examined not only over time, but across space (geography) as well, the declines appear to be pervasive and widespread. The results suggest that the efforts of government to stem the tide of prescription opioid diversion may have been effective—at least when diversion is operationally defined as doctor shopping.

The trends described above should be assessed in light of other information that is available regarding the nonmedical use of prescription opioids. Data provided by the NSDUH indicate that both past year and past month nonmedical use of prescription opioids remained relatively stable over the period under study (the former holding constant at about 4.82% and the latter holding constant at about 1.95% during the decade ending 2012) (SAMHSA, 2013a).

But other findings indicate that the consequences of nonmedical use of prescription opioids continue to accumulate. Each year SAMHSA provides estimates of ED visits through DAWN (SAMHSA, 2013b). Findings related to the drugs of interest here are provided in Table 11 below.

Table 11. DAWN ED Visits

Year	2004	2005	2006	2007	2008	2009	2010	2011	%Change
Drug									
Buprenorphine	—	—	4,440	7,136	12,544	14,266	15,778	21,483	—
Codeine	7,176	6,181	6,928	5,648	8,235	7,962	7,928	9,927	—
Fentanyl	9,823	11,211	16,012	15,947	20,179	20,945	21,196	20,034	104
Hydrocodone	39,846	47,194	57,550	65,734	89,052	86,258	95,972	82,480	107
Hydromorphone	3,385	4,714	6,780	9,497	12,142	14,337	17,666	18,224	438
Methadone	36,806	42,684	45,130	53,950	63,629	63,031	65,945	66,870	82
Morphine	14,090	15,762	20,416	29,591	28,818	31,731	29,605	34,593	146
Oxycodone	41,701	52,943	64,891	76,684	105,526	148,974	146,355	151,218	263
Propoxyphene	6,744	7,648	6,220	7,401	13,364	9,526	8,832	1,655	-75
Tramadol	4,849	5,918	6,048	8,039	11,850	15,349	16,251	20,000	312
Total	164,420	194,255	229,975	272,491	352,795	398,113	409,750	405,001	146

Over the period 2004—2011 ED visits involving prescription opioids increased by approximately 146%. There is a fairly steady trend with some leveling off occurring between 2009 and 2011. Increases in all drugs are apparent with the exception of propoxyphene—which the Food and Drug Administration (FDA) withdrew from the market during 2010.

A similar phenomenon is found when admissions to drug treatment programs are examined. During the decade ending in calendar 2010, admissions to treatment in which a non-heroin opioid was indicated as the primary drug of abuse grew from 2.1% to 8.6% —surpassing cocaine as the primary drug of abuse (SAMHSA, 2004, 2012).

These findings, taken as a whole, are likely manifestations of the normal course of a drug use epidemic, in which incidence rises rapidly, reaches a plateau, and then declines; and where prevalence eventually becomes the residual product of long term use, resulting ultimately in contact with the health care and drug treatment systems (Caulkins, 2005; Golub et al., 2012; Rossi, 2002; Simeone et al., 2002). And they reinforce, not surprisingly, the importance of early detection and intervention in minimizing the consequences of drug-using behavior (Caulkins, 2006).

At the same time they highlight the need for further investigation into the sources of supply upon which chronic nonmedical users of prescription opioids depend. If doctor shopping declined even as admission to drug treatment programs increased then it may be that the broad reduction in doctor shopping behavior which occurred was insufficient to affect the relatively small number of people who were persistent users. And they imply that the roles of theft, sponsorship, and more highly organized forms of criminal activity in perpetuating diversion must be addressed (Rigg et al., 2012).

Bibliography

Al-Edwan A, Alghazawi S. Morphine versus tramadol for postoperative pain control after thoracoscopic surgery. Middle East Journal of Age and Aging 2012; 9(1): 9-12.

Anderson R, Saiers JH, Abram S, Schlict C. Accuracy in equianalgesic dosing: conversion dilemmas. Journal of Pain and Symptom Management 2001; 21(5): 397-406.

Beaver WT, Wallerstein SL, Rogers A, Houde RW. Analgesic studies of codeine and oxycodone in patients with cancer II: comparisons of intramuscular oxycodone with intramuscular morphine and codeine. Journal of Pharmacology and Experimental Therapeutics 1978; 207(1): 101-108.

Bruera E, Belzile M, Pitushkin E, Fainsinger R, Darke A, Harsanyi Z, Babul N, Ford I. Randomized, double blind, cross-over trial comparing safety and efficacy of oral controlled-release oxycodone with controlled release morphine in patients with cancer pain. Journal of Clinical Oncology 1998; 16(10): 3222-3229.

Bruera E, Pereira J, Watanabe S, Belzile M, Kuehn N, Hanson J. Opioid rotation in patients with cancer pain. Cancer 1996; 78(4): 852-857.

Cepeda MS, Fife D, Chow W, Mastrogiovanni G, Henderson SC. Assessing opioid shopping behavior: a large cohort study from a medication dispensing database. Drug Safety 2012; 35(4): 325-334.

Cepeda MS, Fife D, Chow W, Mastrogiovanni G, Henderson SC. Opioid shopping behavior: how often, how soon, which drugs, and what payment method. Journal of Clinical Pharmacology 2012; 53(1):112-7. doi:10.1177/0091270012436561.

Cicero TJ, Kurtz SP, Surrett, HL, Ibanez GE, Ellis MA, Levi-Minzi MA, Inciardi JA. Multiple determinants of specific modes of prescription opioid diversion. Journal of Drug Issues 2011; 41(2): 283-304.

Clark RF, Wei EM, Anderson, PO. Meperidine: therapeutic use and toxicity. The Journal of Emergency Medicine 1995; 13(6): 797-802.

Coalition Against Insurance Fraud. Prescription for Peril: How Insurance Finances Theft and Abuse of Addictive Prescription Drugs. 2007.

Compton WM, Volkow ND. Major increases in opioid analgesic abuse in the United States: concerns and strategies. Drug and Alcohol Dependence 2006; 81(2): 103-107.

Davis WR, Johnson BD. Prescription opioid use, misuse, and diversion among street drug users in New York City. Drug and Alcohol Dependency 2008; 92(1-3): 267-276. doi:10.1016/j.drugalcdep.2007.08.008.

Dunbar PJ, Chapman CR, Buckley FP, Garvin JR. Clinical analgesic equivalence for morphine and hydromorphone with prolonged PCA. Pain 1996; 68(2-3): 265-270.

Executive Office of the President of the United States. Epidemic: Responding to America's Prescription Drug Abuse Crisis. 2011. Prescription Drug Abuse | The White House

Foral PA, Ineck JR, Nystrom KK. Oxycodone accumulation in a hemodialysis patient. Southern Medical Journal 2007; 100(2): 212-214.

Fudin J. Opioid pain management: balancing risks and benefits. Drug Topics 2011. 46-54.

Glass PS. Remifentanil: a new opioid. Journal of Clinical Anesthesia 1995; 7(7): 558-563.

Gordon DB, Stevenson KK, Griffie J, Muchka S, Rapp C, Ford-Roberts K. Opioid equianalgesic calculations. Journal of Palliative Medicine 1999; 2(2): 209-218.

Greener M. Co-codamol: safely using an effective analgesic. Nurse Prescribing 2010; 8(8): 369-374.

Hall JA, Logan JE, ToblinRL, Kaplan JA, Kraner JC, Bixler D, Crosby AE, Paulozi LJ. Patterns of abuse among unintentional pharmaceutical overdose fatalities. Journal of the American Medical Association 2008; 300 (22): 2613-2620.

Heiskanen T, Kalso E. Controlled-release oxycodone and morphine in cancer-related pain. Pain 1997; 73(1): 37-45.

Hunt R, Fazekas B, Thorne D, Brooksbank M. A comparison of subcutaneous morphine and fentanyl in hospice cancer patients. Journal of Pain Symptom Management 1999; 18(2): 111-119.

Inciardi JA, Surratt HL, Kurtz SP, Burke AJ. The diversion of prescription drugs by health care workers in Cincinnati, Ohio. Substance Use & Misuse 2006; 41: 255-264. doi:10.1080/10826080500391829.

Inciardi JA, Surrett HL, Kurtz SP, Cicero TJ. Mechanisms of prescription drug diversion among drug-involved club- and street-based populations. Pain Medicine 2007; 8(2): 171-183. doi:10.1111/j.1526-4637.2006.00255.x.

Inciardi JA, Surratt HL, Cicero TJ, Kurtz SP, Martin SS, Parrino MW. The "black box" of prescription drug diversion. Journal of Addictive Diseases 2009; 28(4): 332-347. doi:10.1080/10550880903182986.

Inturrisi CE. Clinical pharmacology of opioids for pain. Clinical Journal of Pain 2002; 18(4): S1-S11.

Kalso E, Vainio A. Morphine and oxycodone hydrochloride in the management of cancer pain. Journal of Clinical Pharmacy and Therapeutics 1990; 47(5): 639-646.

Kuehn BM. Opioid prescriptions soar; Increase in legitimate use as well as abuse. Journal of the American Medical Assocaition 2007; 297 (3): 249-251.

Lawlor PG, Turner KS, Hanson J, Bruera ED. Dose ratio between morphine and methadone in patients with cancer pain: a retrospective study. Cancer 1998; 82(6): 1167-1173.

Lawlor PG, Turner KS, Hanson J, Bruera ED. Dose ratio between morphine and hydromorphone in patients with cancer pain: a retrospective study. Pain 1997; 72(1-2): 79-85.

Leppert W. Dihydrocodeine as an opioid analgesic for the treatment of moderate to severe chronic pain. Current Drug Metabolism 2010; 11(6): 494-506.

Longshore D, Annon J, Anglin MD, Rawson RA. Levo-alpha-acetylmethadol (LAAM) versus methadone: treatment retention and opiate use. Addiction 2005; 100(8): 1131-1139.

McDonald DC, Carlsen, KE. Estimating the prevalence of opioid diversion by "doctor shoppers" in the United States. PLoS ONE 2013; 8(7): e69241. doi:10.1371/journal.pone.0069241.

McLellan AT, Turner BJ. Chronic noncancer pain management and opioid overdose; time to change prescribing practices. Annals of Internal Medicine 2010; 152(2): 123-124.

Mercadante S, Casuccio A, Tirelli W, Giarratano A. Equipotent doses to switch from high doses of opioids to transdermal buprenorphine. Support Care Cancer 2009; 17(6): 715-718.

Michna E, Duh MS, Korves C, Dahl JL. Removal of opioid.acetaminophen combination prescription pain medications: assessing the evidence for hepatotoxicity and consequences of removal of these medications. Pain Medicine 2010; 11(3): 369-378.

Morrison RS, Wallenstein S, Natale Dk, Senzel RS, Huang LI. "We don't carry that"-- Failure of pharmacies in predominantly nonwhite neighborhoods to stock opioid analgesics. New England Journal of Medicine 2000; 342(14): 1023-1026.

Newcombe DA, Bochner F, White JM. Evaluation of levo-alpha-acetylmethadol (LAAM) as an alternative treatment for methadone maintenance patients who regularly experience withdrawal; a pharmacokinetic and pharmacodynamics analysis. Drug and Alcohol Dependence 2004; 76(1): 63-72.

Noble M, Tregear SJ, Treadwell JR, Scholles K. Long-term opioid therapy for chronic noncancer pain: a systematic review and meta-analysis of efficacy and safety. Journal of Pain and Symptom Management 2008; 35(2); 214-228.

Paix A, Coleman A, Lees J, Grigson J, Brooksbank M, Thorne D, Ashby M. Subcutaneous fentanyl and sufentanyl infusion substitution for morphine intolerance in cancer pain management. Pain 1995; 63(2): 263-269.

Paulozzi LJ, Budnitz DS, Xi Y. Increasing deaths from opioid analgesics in the United States. Pharmacoepidemiology and Drug Safety 2006; 15(9): 618-627.

Parente ST, Kim SS, Finch MD, Schloff LA, Thomas RS, Seifeldin R, Haddox JD. Identifying controlled substance patterns of utilization requiring evaluation using administrative claims data. The American Journal of Managed Care 2004; 10(11): 783-790.

Pereira J, Lawlor P, Vigano A, Dorgan M, Bruera E. Equianalgesic dose ratios for opioids: a critical review and proposals for long-term dosing. Journal of Pain and Symptom Management 2001; 22(2): 672-687.

Philip BK, PE. Scuderi Chung F, Conahan TJ, Maurer W, Angel JJ, Kallar SK, Skinner EP, Jamerson BD. Remifentanyl compared with afentanil for ambulatory surgery using total intravenous anesthesia. Anesthesia & Analgesia 1997; 84: 515-521.

Pradel V, Frauger E, Thirion X, Ronfle E, Lapierre V, Masut A, Coudert C, Blin O, Micallef J. Impact of a prescription monitoring program on doctor-shopping for high dosage buprenorphine. Pharmacoepidimiology and Drug Safety 2009; 18(1); 36-43.

Pradel V, Thirion X, Ronfle E, Masut A, Micallef J, Begaud B. Assessment of doctor-shopping for high dosage buprenorphine maintenance treatment in French region: development of a new method for prescription database. Pharmacoepidimiology and Drug Safety 2004; 13(7): 473-481.

Prommer E. Levorphanol: the forgotten opioid. Support Care Cancer 2007; 15(3): 259-264.

Ripamonti C, Groff L, Brunelli C, Polastri D, Stravakis A, DeConno F. Switching from morphine to oral methadone in treating cancer pain: what is the equianalgesic dose ratio? Journal of Clinical Oncology 1998; 16(10): 3216-3221.

Rigg KK, Kurtz SP, Surrett HL. Patterns of prescription medication diversion among drug dealers. Drugs (Abingdon Engl) 2012; 19(2): 144-155. doi:10.3109/09687637.2011.631197

Rigg KK, March SJ, and Inciardi JA. Prescription drug abuse & diversion: role of the pain clinic. Journal of Drug Issues 2010; 40(3): 681-702.

Schneider MF, Bailey JE, Cicero TJ, Dart RC, Inciardi JA, Parrino M, Munoz A. Integrating nine prescription opioid analgesics and/or four signal detection systems to summarize statewide prescription drug abuse in the United States in 2007. Pharmacoepidimiology and Drug Safety 2009; 18(9): 778-790.

Schobelock Mj. Product Discontinue Notice (Orlaam). Boehringer Ingelheim, Roxane Laboratories. 2003 August 23. http://dpt.samhsa.gov/pdf/RLI_ORLAAM.pdf

Schulte H, Segerdahl M, Graven-Nielson T, Grass S. Reduction of human experimental muscle pain by alfentanil and morphine. European Journal of Pain 2006; 10(8): 731-741.

Shaiova L. Update to demystifying opioid conversion calculations; a guide for effective dosing. Journal of Palliative Medicine 2011; 14(5): 668-668.

Simeone R, Holland L, Viveros-Aguelara R. Estimating the size of an illicit drug-using population. Statistics in Medicine 2003; 22(19): 2969-2993.

Stevenson JG, Mitchell JF. Reducing the use of meperidine in hospital practice. Pharmacy Practice News. 2007; 1-8.

Sullivan MD, Edlund MJ, Fan MY, Devries A, Brennan BJ, Martin BC. Risks for possible and probable opioid misuse among recipients of chronic opioid therapy in commercial and Medicaid insurance plans; the TROUP Study. Pain 2010; 150(2): 332-339.

Sullivan MD, Edlund MJ, Steffick D, Unutzer J. Regular use of prescribed opioids: Association with common psychiatric disorders. Pain 2005; 119(1-3): 95-103.

Substance Abuse and Mental Health Services Administration, Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings (Detailed Tables), NSDUH Series H-46, HHS Publication No. (SMA) 13-4795. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2013a.
2012 Tables: Trend - 7.1 to 7.45 (PE), SAMHSA, CBHSQ

Substance Abuse and Mental Health Services Administration, Drug Abuse Warning Network, 2011: National Estimates of Drug-Related Emergency Department Visits. HHS Publication No. (SMA) 13-4760, DAWN Series D-39. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2013b.
Drug Abuse Warning Network, 2011: National Estimates of Drug-Related Emergency Department Visits

Teachman J, Duncan GJ, Yeung WJ, Levy D. Covariance structure models for fixed and random effects. Sociological Methods and Research 2001; 30(2): 271-288.

Trescot AM, Datta S, Lee M, Hansen H. Opioid pharmacology. Pain Physician 2008: Opioid Special Issue 2008; 11(2S): S133-S153.

Treatment Episode Data Set – Admissions (TEDS-A), 2001. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. U.S. Department of Health and Human Services. ICPSR 3884. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2004-02-05.
Treatment Episode Data Set -- Admissions (TEDS-A), 2001

Treatment Episode Data Set – Admissions (TEDS-A), 2010. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. U.S. Department of Health and Human Services. ICPSR 33261. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2012-07-17. Treatment Episode Data Set -- Admissions (TEDS-A), 2010

United States Department of Justice. The Economic Impact of Illicit Drug Use on American Society. 2011.

Vallejo M, Barkin RL, Wang VC. Pharmacology of opioids in the treatment of chronic pain syndromes. Pain Physician Journal 2011; 14: E343-E360.

Warra-Wolleat KL, Hildebrand KR, Stewart GR. A review of intrathecal fentanyl and sufentanil. Pain Medicine 2006; 7(3): 251-259.

Watanabe S, Pereira J, Hanson J, Bruera E. Fentanyl by continuous subcutaneous infusion for the management of cancer pain: a retrospective study. Journal of Pain Symptom Management 1998; 16(5): 323-326.

White AG, Birnbaum HG, Schiller M, Tang J, Katz NP. Analytic models to identify patients at risk for prescription opioid abuse. American Journal of Managed Care 2009; 15(12): 897-906.

Appendix A

Five-Year Stability Sample, State Attribution, Duplicated:

2008-2012

Table A.1a Base Year Sample, State Attribution, Duplicated (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	35.6299%	3.4808%	0.1678%	0.0088%	0.0009%	0.0001%
Milligrams		57.4543%	7.2671%	0.4861%	0.0285%	0.0025%	0.0004%
Cash		56.1081%	6.7304%	0.5224%	0.0506%	0.0098%	0.0023%
Cash/Total | Contingency		6.8246%	6.5808%	7.1465%	11.8680%	31.9071%	40.6688%
Prescriptions	2	10.5696%	2.9625%	0.1732%	0.0105%	0.0009%	0.0002%
Milligrams		12.3341%	3.6239%	0.3146%	0.0222%	0.0020%	0.0006%
Cash		9.7258%	5.9662%	0.6268%	0.0600%	0.0087%	0.0044%
Cash/Total | Contingency		5.5213%	11.7571%	13.4774%	17.4453%	31.8414%	71.1948%
Prescriptions	3	0.5629%	0.2934%	0.0990%	0.0095%	0.0009%	0.0002%
Milligrams		0.6558%	0.3569%	0.1237%	0.0149%	0.0017%	0.0003%
Cash		0.7040%	0.6469%	0.4496%	0.0590%	0.0087%	0.0017%
Cash/Total | Contingency		6.6738%	12.1341%	25.4383%	27.4920%	34.7532%	40.0214%
Prescriptions	4	0.0222%	0.0180%	0.0108%	0.0061%	0.0012%	0.0002%
Milligrams		0.0285%	0.0235%	0.0132%	0.0075%	0.0018%	0.0003%
Cash		0.0379%	0.0724%	0.0474%	0.0459%	0.0086%	0.0043%
Cash/Total | Contingency		7.7119%	19.3462%	24.3492%	32.7986%	29.7655%	51.4998%
Prescriptions	5	0.0009%	0.0008%	0.0009%	0.0009%	0.0009%	0.0003%
Milligrams		0.0026%	0.0013%	0.0010%	0.0009%	0.0012%	0.0004%
Cash		0.0027%	0.0033%	0.0019%	0.0072%	0.0079%	0.0024%
Cash/Total | Contingency		8.8174%	16.2750%	17.9575%	38.8045%	29.2235%	31.0807%
Prescriptions	6	0.0001%	0.0000%	0.0001%	0.0001%	0.0002%	0.0002%
Milligrams		0.0008%	0.0000%	0.0001%	0.0001%	0.0002%	0.0002%
Cash		0.0006%	0.0000%	0.0001%	0.0006%	0.0017%	0.0024%
Cash/Total | Contingency		18.5197%	0.0000%	25.0238%	51.2582%	35.7184%	42.5517%

Table A.1b Base Year Sample, State Attribution, Duplicated (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	94,648,643	9,246,668	445,688	23,309	2,268	338
Milligrams		149,019,746,812	18,848,832,237	1,260,893,533	73,894,403	6,538,954	991,172
Cash		$516,980,359	$62,014,227	$4,813,432	$466,086	$90,462	$21,430
Cash/Prescription		$5	$7	$11	$20	$40	$63
Prescriptions	2	28,077,485	7,869,702	460,096	27,953	2,312	614
Milligrams		31,991,039,307	9,399,384,448	815,991,206	57,696,969	5,074,714	1,506,547
Cash		$89,613,180	$54,972,477	$5,775,513	$552,576	$80,162	$40,870
Cash/Prescription		$3	$7	$13	$20	$35	$67
Prescriptions	3	1,495,298	779,361	263,110	25,282	2,310	484
Milligrams		1,701,015,918	925,646,149	320,947,904	38,758,219	4,491,582	712,025
Cash		$6,486,331	$5,960,276	$4,142,218	$544,023	$80,017	$15,829
Cash/Prescription		$4	$8	$16	$22	$35	$33
Prescriptions	4	58,960	47,778	28,619	16,311	3,117	545
Milligrams		73,864,381	60,977,611	34,335,763	19,467,073	4,712,487	811,365
Cash		$349,037	$667,158	$437,103	$422,516	$78,864	$39,844
Cash/Prescription		$6	$14	$15	$26	$25	$73
Prescriptions	5	2,493	2,232	2,323	2,344	2,305	767
Milligrams		6,819,231	3,400,855	2,543,575	2,320,577	3,157,166	1,109,400
Cash		$24,717	$30,804	$17,511	$66,739	$72,488	$22,168
Cash/Prescription		$10	$14	$8	$28	$31	$29
Prescriptions	6	335	56	223	331	605	640
Milligrams		2,093,366	32,998	146,958	254,162	394,862	478,457
Cash		$5,576	$0	$962	$5,878	$15,791	$22,516
Cash/Prescription		$17	$0	$4	$18	$26	$35

Table A.2a Five-Year Stability Sample, State Attribution, Duplicated, 2008 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	32.4692%	1.4101%	0.0527%	0.0060%	0.0017%	0.0010%
Milligrams		34.1604%	1.6719%	0.0809%	0.0100%	0.0028%	0.0010%
Cash		30.2788%	2.6012%	0.2357%	0.0404%	0.0135%	0.0073%
Cash/Total | Contingency		10.5351%	18.6488%	32.7161%	54.1223%	67.8710%	79.6422%
Prescriptions	2	9.7298%	1.8486%	0.0854%	0.0066%	0.0010%	0.0005%
Milligrams		7.6922%	1.5504%	0.0946%	0.0093%	0.0022%	0.0010%
Cash		5.4134%	3.7074%	0.2722%	0.0348%	0.0078%	0.0043%
Cash/Total | Contingency		8.1014%	29.9821%	34.7485%	49.1924%	49.1292%	67.2003%
Prescriptions	3	0.6168%	0.2033%	0.1104%	0.0109%	0.0016%	0.0004%
Milligrams		0.5255%	0.1952%	0.1000%	0.0127%	0.0030%	0.0016%
Cash		0.4025%	0.4070%	0.4246%	0.0478%	0.0076%	0.0028%
Cash/Total | Contingency		7.7059%	25.3786%	52.9406%	49.0565%	46.9443%	55.8122%
Prescriptions	4	0.0362%	0.0154%	0.0138%	0.0160%	0.0025%	0.0006%
Milligrams		0.0332%	0.0154%	0.0164%	0.0144%	0.0028%	0.0005%
Cash		0.0328%	0.0297%	0.0695%	0.0714%	0.0107%	0.0018%
Cash/Total | Contingency		9.8345%	23.1646%	51.1635%	60.6896%	55.0397%	41.0897%
Prescriptions	5	0.0027%	0.0016%	0.0015%	0.0025%	0.0035%	0.0011%
Milligrams		0.0024%	0.0020%	0.0019%	0.0030%	0.0029%	0.0011%
Cash		0.0024%	0.0054%	0.0067%	0.0154%	0.0192%	0.0059%
Cash/Total | Contingency		8.3053%	33.9297%	35.0546%	64.3226%	69.3974%	78.6608%
Prescriptions	6	0.0002%	0.0002%	0.0004%	0.0005%	0.0008%	0.0023%
Milligrams		0.0002%	0.0002%	0.0004%	0.0005%	0.0007%	0.0016%
Cash		0.0002%	0.0003%	0.0014%	0.0024%	0.0048%	0.0092%
Cash/Total | Contingency		8.7409%	15.1889%	35.1010%	46.7328%	60.3090%	79.1057%

Table A.2b Five-Year Stability Sample, State Attribution, Duplicated, 2008 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	79,643,153	3,458,806	129,318	14,755	4,070	2,382
Milligrams		117,882,968,865	5,769,481,979	279,212,976	34,377,751	9,531,705	3,494,910
Cash		$702,665,397	$60,363,887	$5,470,611	$936,565	$313,420	$170,219
Cash/Prescription		$9	$17	$42	$63	$77	$71
Prescriptions	2	23,866,060	4,534,423	209,474	16,111	2,530	1,129
Milligrams		26,544,711,604	5,350,352,092	326,399,536	32,143,450	7,421,922	3,472,241
Cash		$125,626,871	$86,035,338	$6,317,050	$807,739	$180,063	$98,679
Cash/Prescription		$5	$19	$30	$50	$71	$87
Prescriptions	3	1,512,907	498,762	270,777	26,823	3,945	1,070
Milligrams		1,813,341,615	673,509,257	345,006,350	43,751,446	10,360,404	5,361,727
Cash		$9,339,739	$9,444,740	$9,853,465	$1,109,864	$176,953	$65,775
Cash/Prescription		$6	$19	$36	$41	$45	$61
Prescriptions	4	88,791	37,834	33,784	39,247	6,141	1,482
Milligrams		114,545,314	53,287,055	56,553,562	49,592,463	9,609,821	1,821,698
Cash		$760,242	$690,052	$1,613,187	$1,657,081	$249,065	$40,756
Cash/Prescription		$9	$18	$48	$42	$41	$28
Prescriptions	5	6,500	4,027	3,602	6,143	8,657	2,605
Milligrams		8,221,502	7,043,007	6,530,727	10,356,408	10,014,382	3,787,744
Cash		$55,101	$125,824	$155,908	$358,413	$446,687	$137,602
Cash/Prescription		$8	$31	$43	$58	$52	$53
Prescriptions	6	502	376	860	1,111	1,887	5,545
Milligrams		684,116	805,891	1,461,521	1,677,504	2,481,090	5,593,450
Cash		$4,806	$7,726	$33,205	$56,648	$111,083	$214,426
Cash/Prescription		$10	$21	$39	$51	$59	$39

Table A.3a Five-Year Stability Sample, State Attribution, Duplicated, 2009 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	32.9740%	1.3674%	0.0473%	0.0052%	0.0012%	0.0003%
Milligrams		34.4418%	1.7056%	0.0738%	0.0085%	0.0026%	0.0005%
Cash		30.7392%	2.1648%	0.1566%	0.0308%	0.0095%	0.0010%
Cash/Total | Contingency		10.6777%	15.2336%	23.9961%	42.0443%	56.7373%	35.1188%
Prescriptions	2	9.6021%	1.6477%	0.0698%	0.0046%	0.0008%	0.0003%
Milligrams		7.4841%	1.3759%	0.0823%	0.0061%	0.0014%	0.0004%
Cash		5.6175%	2.9396%	0.2125%	0.0177%	0.0039%	0.0007%
Cash/Total | Contingency		8.7574%	26.1369%	29.0629%	33.1269%	42.9549%	31.9138%
Prescriptions	3	0.5768%	0.1754%	0.0732%	0.0063%	0.0008%	0.0003%
Milligrams		0.4793%	0.1615%	0.0661%	0.0072%	0.0011%	0.0009%
Cash		0.4037%	0.3247%	0.2571%	0.0271%	0.0043%	0.0015%
Cash/Total | Contingency		8.6170%	23.1545%	44.9935%	42.9752%	45.1102%	65.3003%
Prescriptions	4	0.0301%	0.0126%	0.0090%	0.0075%	0.0011%	0.0003%
Milligrams		0.0271%	0.0121%	0.0094%	0.0068%	0.0011%	0.0006%
Cash		0.0315%	0.0250%	0.0342%	0.0323%	0.0041%	0.0015%
Cash/Total | Contingency		9.8932%	21.7124%	42.0650%	53.3474%	52.2075%	88.8356%
Prescriptions	5	0.0021%	0.0009%	0.0009%	0.0012%	0.0016%	0.0004%
Milligrams		0.0020%	0.0009%	0.0007%	0.0017%	0.0013%	0.0003%
Cash		0.0029%	0.0021%	0.0026%	0.0094%	0.0080%	0.0013%
Cash/Total | Contingency		7.6578%	25.3594%	34.0603%	54.1849%	75.1140%	80.3211%
Prescriptions	6	0.0005%	0.0001%	0.0002%	0.0002%	0.0002%	0.0008%
Milligrams		0.0006%	0.0002%	0.0001%	0.0003%	0.0002%	0.0009%
Cash		0.0001%	0.0006%	0.0003%	0.0012%	0.0007%	0.0052%
Cash/Total | Contingency		2.2568%	37.2503%	25.8762%	34.8993%	60.3503%	84.0222%

Table A.3b Five-Year Stability Sample, State Attribution, Duplicated, 2009 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	83,300,304	3,454,504	119,418	13,222	2,928	812
Milligrams		128,344,402,831	6,355,743,025	274,970,440	31,697,600	9,506,119	1,799,942
Cash		$743,506,684	$52,360,610	$3,786,677	$745,656	$230,505	$23,344
Cash/Prescription		$9	$15	$32	$56	$79	$29
Prescriptions	2	24,257,323	4,162,588	176,212	11,669	2,128	765
Milligrams		27,888,732,984	5,127,257,602	306,723,179	22,614,400	5,301,780	1,416,870
Cash		$135,874,822	$71,102,425	$5,139,706	$428,102	$94,358	$16,304
Cash/Prescription		$6	$17	$29	$37	$44	$21
Prescriptions	3	1,457,080	443,146	185,007	15,822	2,140	679
Milligrams		1,786,022,265	601,697,476	246,221,678	26,814,876	4,034,713	3,281,923
Cash		$9,764,450	$7,854,859	$6,219,157	$656,284	$103,970	$36,541
Cash/Prescription		$7	$18	$34	$41	$49	$54
Prescriptions	4	76,049	31,934	22,714	18,880	2,829	655
Milligrams		101,070,071	45,185,736	34,942,881	25,396,530	3,959,020	2,112,626
Cash		$763,025	$603,574	$827,011	$780,304	$98,410	$36,068
Cash/Prescription		$10	$19	$36	$41	$35	$55
Prescriptions	5	5,207	2,219	2,361	3,010	4,037	1,001
Milligrams		7,445,143	3,450,819	2,794,677	6,289,928	4,755,670	1,303,005
Cash		$70,017	$51,665	$62,664	$226,844	$193,060	$32,235
Cash/Prescription		$13	$23	$27	$75	$48	$32
Prescriptions	6	1,232	227	444	512	487	2,020
Milligrams		2,060,504	561,387	491,034	1,159,364	726,604	3,224,852
Cash		$3,054	$15,554	$8,290	$28,171	$17,548	$126,345
Cash/Prescription		$2	$69	$19	$55	$36	$63

Table A.4a Five-Year Stability Sample, State Attribution, Duplicated, 2010 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	33.0371%	1.2653%	0.0371%	0.0033%	0.0007%	0.0003%
Milligrams		34.8637%	1.5541%	0.0578%	0.0049%	0.0019%	0.0014%
Cash		31.4208%	1.6929%	0.1059%	0.0194%	0.0079%	0.0076%
Cash/Total | Contingency		13.0145%	15.7350%	25.2835%	53.0587%	70.3244%	89.7385%
Prescriptions	2	9.3842%	1.4291%	0.0544%	0.0036%	0.0005%	0.0002%
Milligrams		7.1913%	1.1780%	0.0609%	0.0055%	0.0013%	0.0005%
Cash		5.1359%	2.5868%	0.1681%	0.0182%	0.0060%	0.0024%
Cash/Total | Contingency		10.3243%	31.0125%	36.3251%	48.1640%	71.7972%	68.5106%
Prescriptions	3	0.5379%	0.1459%	0.0540%	0.0042%	0.0004%	0.0001%
Milligrams		0.4299%	0.1272%	0.0482%	0.0041%	0.0006%	0.0000%
Cash		0.3400%	0.2935%	0.2116%	0.0144%	0.0013%	0.0001%
Cash/Total | Contingency		10.4570%	30.0019%	55.3143%	42.7434%	33.2963%	67.9817%
Prescriptions	4	0.0269%	0.0100%	0.0063%	0.0051%	0.0006%	0.0000%
Milligrams		0.0245%	0.0087%	0.0059%	0.0038%	0.0005%	0.0000%
Cash		0.0204%	0.0215%	0.0272%	0.0163%	0.0019%	0.0001%
Cash/Total | Contingency		9.7483%	29.2157%	56.4427%	52.6465%	45.6674%	95.8443%
Prescriptions	5	0.0016%	0.0006%	0.0007%	0.0008%	0.0011%	0.0001%
Milligrams		0.0018%	0.0006%	0.0007%	0.0006%	0.0007%	0.0001%
Cash		0.0008%	0.0016%	0.0038%	0.0018%	0.0028%	0.0003%
Cash/Total | Contingency		4.5223%	23.5268%	61.2764%	45.4724%	42.6183%	33.6851%
Prescriptions	6	0.0003%	0.0000%	0.0000%	0.0000%	0.0002%	0.0003%
Milligrams		0.0006%	0.0000%	0.0000%	0.0001%	0.0001%	0.0003%
Cash		0.0015%	0.0000%	0.0001%	0.0000%	0.0005%	0.0014%
Cash/Total | Contingency		26.4917%	0.0000%	51.3149%	3.7257%	47.6451%	44.1807%

Table A.4b Five-Year Stability Sample, State Attribution, Duplicated, 2010 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	86,249,540	3,303,272	96,848	8,612	1,926	825
Milligrams		139,669,075,020	6,226,023,955	231,705,562	19,825,753	7,617,957	5,796,024
Cash		$953,810,502	$51,389,519	$3,214,843	$589,978	$239,527	$230,217
Cash/Prescription		$11	$16	$33	$69	$124	$279
Prescriptions	2	24,499,105	3,731,048	141,920	9,416	1,399	397
Milligrams		28,809,310,655	4,719,218,571	243,895,092	22,004,110	5,140,395	1,961,382
Cash		$155,906,310	$78,523,776	$5,103,098	$553,535	$183,190	$71,894
Cash/Prescription		$6	$21	$36	$59	$131	$181
Prescriptions	3	1,404,315	380,770	141,088	10,952	1,146	166
Milligrams		1,722,210,205	509,519,159	193,259,227	16,330,903	2,396,506	108,818
Cash		$10,319,749	$8,910,662	$6,424,550	$438,217	$38,247	$2,141
Cash/Prescription		$7	$23	$46	$40	$33	$13
Prescriptions	4	70,238	25,995	16,474	13,434	1,575	88
Milligrams		97,975,877	35,028,953	23,515,475	15,258,877	1,856,460	45,572
Cash		$618,555	$653,569	$825,948	$494,502	$56,209	$1,566
Cash/Prescription		$9	$25	$50	$37	$36	$18
Prescriptions	5	4,129	1,531	1,725	2,034	2,905	161
Milligrams		7,400,990	2,408,707	2,730,396	2,283,503	2,736,306	282,842
Cash		$24,112	$47,730	$116,836	$56,014	$86,512	$9,396
Cash/Prescription		$6	$31	$68	$28	$30	$58
Prescriptions	6	702	26	92	113	465	666
Milligrams		2,498,053	78,481	42,103	223,660	599,943	1,074,493
Cash		$46,743	$0	$3,661	$291	$16,185	$43,229
Cash/Prescription		$67	$0	$40	$3	$35	$65

Table A.5a Five-Year Stability Sample, State Attribution, Duplicated, 2011 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	33.3749%	1.2872%	0.0372%	0.0026%	0.0005%	0.0005%
Milligrams		35.1310%	1.6102%	0.0597%	0.0041%	0.0003%	0.0003%
Cash		31.4947%	1.5721%	0.0820%	0.0096%	0.0014%	0.0010%
Cash/Total | Contingency		12.6252%	14.7339%	19.8779%	32.0931%	50.3438%	41.9906%
Prescriptions	2	9.3639%	1.3431%	0.0483%	0.0029%	0.0005%	0.0001%
Milligrams		7.1571%	1.0727%	0.0541%	0.0047%	0.0008%	0.0001%
Cash		5.1485%	2.3009%	0.1249%	0.0205%	0.0066%	0.0003%
Cash/Total | Contingency		10.0008%	29.9646%	31.6536%	57.7778%	82.2458%	51.9722%
Prescriptions	3	0.5180%	0.1335%	0.0482%	0.0035%	0.0004%	0.0000%
Milligrams		0.4129%	0.1136%	0.0405%	0.0038%	0.0005%	0.0000%
Cash		0.3017%	0.2327%	0.1749%	0.0152%	0.0018%	0.0000%
Cash/Total | Contingency		9.2839%	27.1033%	52.0544%	56.1796%	48.1342%	56.2821%
Prescriptions	4	0.0239%	0.0090%	0.0055%	0.0048%	0.0007%	0.0001%
Milligrams		0.0218%	0.0072%	0.0050%	0.0038%	0.0006%	0.0001%
Cash		0.0166%	0.0138%	0.0176%	0.0160%	0.0015%	0.0002%
Cash/Total | Contingency		9.4085%	25.9389%	49.7152%	61.4107%	49.3066%	59.9587%
Prescriptions	5	0.0010%	0.0004%	0.0004%	0.0008%	0.0010%	0.0003%
Milligrams		0.0012%	0.0003%	0.0003%	0.0009%	0.0009%	0.0003%
Cash		0.0009%	0.0007%	0.0010%	0.0034%	0.0020%	0.0008%
Cash/Total | Contingency		10.0174%	37.0828%	48.9836%	66.7748%	48.1226%	50.4909%
Prescriptions	6	0.0001%		0.0000%	0.0001%	0.0002%	0.0003%
Milligrams		0.0001%		0.0000%	0.0001%	0.0001%	0.0001%
Cash		0.0001%		0.0001%	0.0002%	0.0002%	0.0004%
Cash/Total | Contingency		17.8488%		84.0201%	41.0554%	33.5827%	40.2355%

Table A.5b Five-Year Stability Sample, State Attribution, Duplicated, 2011 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	87,706,892	3,382,656	97,830	6,893	1,237	1,324
Milligrams		141,493,634,701	6,485,231,141	240,418,176	16,600,328	1,342,477	1,185,354
Cash		$917,579,440	$45,802,416	$2,390,433	$278,537	$39,366	$28,691
Cash/Prescription		$10	$14	$24	$40	$32	$22
Prescriptions	2	24,607,618	3,529,515	126,995	7,555	1,255	344
Milligrams		28,825,855,361	4,320,273,669	218,000,828	18,980,453	3,204,450	361,185
Cash		$149,998,282	$67,034,991	$3,640,174	$597,743	$193,381	$8,223
Cash/Prescription		$6	$19	$29	$79	$154	$24
Prescriptions	3	1,361,192	350,828	126,604	9,068	1,088	66
Milligrams		1,662,854,194	457,405,676	163,286,251	15,291,043	2,176,935	36,904
Cash		$8,790,698	$6,778,728	$5,095,976	$442,290	$53,139	$585
Cash/Prescription		$6	$19	$40	$49	$49	$9
Prescriptions	4	62,691	23,776	14,490	12,572	1,761	146
Milligrams		87,979,047	28,806,006	20,056,131	15,462,466	2,345,401	235,583
Cash		$483,204	$401,696	$512,531	$465,743	$44,610	$6,265
Cash/Prescription		$8	$17	$35	$37	$25	$43
Prescriptions	5	2,698	1,182	1,078	2,050	2,539	675
Milligrams		4,648,373	1,205,256	1,188,951	3,510,105	3,647,364	1,286,049
Cash		$26,122	$21,707	$28,951	$99,402	$58,932	$23,258
Cash/Prescription		$10	$18	$27	$48	$23	$34
Prescriptions	6	255		64	223	505	750
Milligrams		246,315		54,149	323,976	501,373	480,109
Cash		$3,189		$2,115	$5,712	$6,480	$10,960
Cash/Prescription		$12		$33	$26	$13	$15

Table A.6a Five-Year Stability Sample, State Attribution, Duplicated, 2012 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	34.0354%	1.3194%	0.0346%	0.0018%	0.0003%	0.0001%
Milligrams		35.0356%	1.6873%	0.0583%	0.0030%	0.0004%	0.0001%
Cash		32.4579%	1.3084%	0.0509%	0.0050%	0.0006%	0.0001%
Cash/Total | Contingency		11.7295%	10.6330%	11.3298%	22.9902%	27.7873%	19.4033%
Prescriptions	2	9.7466%	1.2393%	0.0405%	0.0019%	0.0002%	0.0000%
Milligrams		7.2846%	0.9455%	0.0438%	0.0024%	0.0002%	0.0000%
Cash		5.5193%	1.3406%	0.0695%	0.0050%	0.0004%	0.0001%
Cash/Total | Contingency		9.5150%	18.7681%	20.5753%	25.0591%	22.2969%	81.1707%
Prescriptions	3	0.5398%	0.1261%	0.0363%	0.0025%	0.0003%	0.0001%
Milligrams		0.4107%	0.0984%	0.0259%	0.0023%	0.0004%	0.0001%
Cash		0.4084%	0.1406%	0.0786%	0.0066%	0.0013%	0.0006%
Cash/Total | Contingency		10.7545%	17.8066%	38.0391%	38.0202%	45.9020%	91.6927%
Prescriptions	4	0.0238%	0.0083%	0.0048%	0.0030%	0.0003%	0.0000%
Milligrams		0.0195%	0.0068%	0.0035%	0.0022%	0.0003%	0.0000%
Cash		0.0258%	0.0277%	0.0106%	0.0099%	0.0006%	0.0002%
Cash/Total | Contingency		12.6511%	37.1374%	38.1307%	49.2931%	34.3462%	85.3233%
Prescriptions	5	0.0008%	0.0004%	0.0006%	0.0005%	0.0006%	0.0001%
Milligrams		0.0008%	0.0004%	0.0005%	0.0003%	0.0004%	0.0000%
Cash		0.0017%	0.0017%	0.0025%	0.0006%	0.0026%	0.0000%
Cash/Total | Contingency		24.6534%	42.0735%	59.1882%	29.6618%	68.3544%	18.6535%
Prescriptions	6	0.0001%	0.0000%	0.0000%	0.0001%	0.0002%	0.0004%
Milligrams		0.0001%	0.0000%	0.0000%	0.0000%	0.0001%	0.0002%
Cash		0.0000%	0.0000%	0.0001%	0.0001%	0.0003%	0.0004%
Cash/Total | Contingency		4.6062%	14.7382%	56.5384%	29.0645%	45.0769%	47.5299%

Table A.6b Five-Year Stability Sample, State Attribution, Duplicated, 2012 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	90,412,848	3,504,990	91,985	4,712	793	276
Milligrams		141,168,379,211	6,798,656,877	235,087,330	12,013,615	1,584,506	279,232
Cash		$848,280,507	$34,195,113	$1,330,430	$131,439	$14,654	$2,326
Cash/Prescription		$9	$10	$14	$28	$18	$8
Prescriptions	2	25,891,160	3,292,046	107,653	5,019	402	47
Milligrams		29,351,600,926	3,809,829,124	176,332,391	9,648,294	869,261	89,343
Cash		$144,246,713	$35,036,027	$1,817,542	$130,488	$11,298	$3,173
Cash/Prescription		$6	$11	$17	$26	$28	$68
Prescriptions	3	1,433,835	335,061	96,481	6,577	804	158
Milligrams		1,654,880,604	396,300,498	104,357,521	9,357,737	1,567,831	397,395
Cash		$10,673,913	$3,673,869	$2,054,509	$173,481	$33,049	$15,795
Cash/Prescription		$7	$11	$21	$26	$41	$100
Prescriptions	4	63,111	21,994	12,874	8,043	817	99
Milligrams		78,514,288	27,538,797	14,097,504	8,704,527	1,184,766	129,974
Cash		$673,638	$724,953	$276,882	$259,301	$16,164	$4,349
Cash/Prescription		$11	$33	$22	$32	$20	$44
Prescriptions	5	2,228	1,160	1,559	1,241	1,666	332
Milligrams		3,037,770	1,732,895	1,853,635	1,171,153	1,530,427	187,107
Cash		$45,581	$45,528	$65,784	$15,340	$68,953	$895
Cash/Prescription		$20	$39	$42	$12	$41	$3
Prescriptions	6	149	113	121	385	451	1,010
Milligrams		283,551	116,413	62,750	167,638	559,296	774,831
Cash		$844	$1,187	$1,426	$2,920	$7,261	$9,866
Cash/Prescription		$6	$10	$12	$8	$16	$10

Appendix B

Five-Year Stability Sample, State Attribution, Unduplicated:

2008-2012

Table B.1a Base Year Sample, State Attribution, Unduplicated (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0834%	1.2685%	48.3508%
Milligrams		0.1343%	1.8781%	72.2978%
Cash		0.3651%	2.8757%	72.2960%
Cash/Total | Contingency		17.2676%	10.0123%	7.0352%

		Lower	Upper	All
Prescriptions		221,665	3,369,660	128,441,156
Milligrams		348,246,842	4,871,138,710	187,519,579,271
Cash		$3,364,138	$26,497,104	$666,136,384
Cash/Prescription		$15	$8	$5

Table B.1b Base Year Sample, State Attribution, Unduplicated (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	39	1,657
BUPRENORPHINE	3,370	7,111,462	61,634	126,561,457	5,570,225	13,262,936,250
BUTORPHANOL_TARTRATE	1,027	338,941	8,848	2,511,525	227,428	68,166,282
CODEINE	5,755	2,106,588	96,409	31,953,082	3,565,265	1,376,685,426
DIHYDROCODONE	6	1,331	403	136,916	20,193	8,617,514
FENTANYL	10,724	1,163,408	161,335	17,493,051	4,677,052	555,750,612
HYDROCODONE	68,514	45,708,912	1,101,927	692,172,474	52,258,003	37,426,271,044
HYDROMORPHONE	7,405	13,210,278	102,285	165,620,332	2,343,852	4,614,642,144
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	45	182,729	2,960	10,979,696
MEPERIDINE	340	91,672	5,665	1,626,437	210,335	71,006,781
METHADONE_HCL	4,237	19,202,837	72,307	307,996,007	3,123,052	14,239,030,643
MORPHINE	12,667	36,971,740	210,987	597,962,265	7,568,627	23,497,688,887
OXYCODONE	76,127	183,998,065	1,096,993	2,409,421,705	32,745,973	78,148,938,758
OXYMORPHONE_HCL	4,302	21,642,261	56,273	264,614,106	1,075,432	5,007,469,152
PENTAZOCINE	111	112,959	1,836	2,091,962	99,503	135,914,463
PROPOXYPHENE	0	0	2	1,890	30	33,879
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	0	0	0	0	1	8
TAPENTADOL_HCL	1,390	3,656,277	26,248	67,156,451	698,135	1,863,751,047
TRAMADOL_HCL	25,691	12,930,112	366,466	183,636,320	14,255,051	7,231,695,030
Sum	221,665	348,246,842	3,369,660	4,871,138,710	128,441,156	187,519,579,272
Checksum	221,665	348,246,842	3,369,660	4,871,138,710	128,441,156	187,519,579,271

Table B.2a Five-Year Stability Sample, State Attribution, Unduplicated, 2008 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.1061%	1.0727%	42.5251%
Milligrams		0.1109%	0.9930%	41.2453%
Cash		0.3305%	1.7594%	39.1241%
Cash/Total | Contingency		34.9873%	19.3703%	11.3218%
		Check (11)	2008	0.001061
			2012	0.000459
				1.3099
			Projection	0.1927%

		Lower	Upper	All
Prescriptions		260,188	2,631,243	104,308,911
Milligrams		382,797,393	3,426,740,277	142,332,056,213
Cash		$7,669,277	$40,830,169	$907,933,470
Cash/Prescription		$29	$16	$9

Table B.2b Five-Year Stability Sample, State Attribution, Unduplicated, 2008 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	.	.
BUPRENORPHINE	1,522	4,729,799	16,855	55,962,126	2,000,294	5,282,140,242
BUTORPHANOL_TARTRATE	1,459	334,111	9,857	2,583,274	292,634	89,088,387
CODEINE	6,887	3,187,286	76,182	27,173,680	3,580,771	1,339,913,105
DIHYDROCODONE	52	30,022	829	325,244	37,424	15,930,645
FENTANYL	12,020	1,362,627	152,038	17,020,664	4,523,687	547,212,459
HYDROCODONE	96,351	63,381,291	953,670	566,184,342	43,715,747	27,947,241,192
HYDROMORPHONE	4,796	6,508,963	57,260	80,071,462	1,334,724	2,489,645,023
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	7	6,789	299	944,516	7,813	26,487,738
MEPERIDINE	868	295,525	11,828	2,955,097	451,719	129,334,983
METHADONE_HCL	4,934	22,693,811	61,859	276,218,197	2,938,205	14,601,691,224
MORPHINE	10,267	27,115,179	137,327	385,294,239	5,162,021	16,723,067,129
OXYCODONE	90,192	232,881,542	802,583	1,755,735,183	24,683,634	60,810,099,369
OXYMORPHONE_HCL	812	2,977,872	12,910	47,700,363	451,442	1,903,658,402
PENTAZOCINE	229	312,709	2,464	3,010,901	136,195	182,765,892
PROPOXYPHENE	6,729	6,213,358	98,126	89,737,300	5,628,395	5,570,846,347
REMIFENTANIL_HCL	0	0	0	0	1	20
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	.	.	.	.	.	.
TRAMADOL_HCL	23,064	10,766,510	237,155	115,823,691	9,364,206	4,672,934,058
Sum	260,188	382,797,393	2,631,243	3,426,740,277	104,308,911	142,332,056,213
Checksum	260,188	382,797,393	2,631,243	3,426,740,277	104,308,911	142,332,056,213

Table B.3a Five-Year Stability Sample, State Attribution, Unduplicated, 2009 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0753%	0.9414%	42.6754%
Milligrams		0.0769%	0.8553%	41.2523%
Cash		0.1977%	1.3547%	38.7501%
Cash/Total | Contingency		25.9561%	16.9808%	11.2660%

		Lower	Upper	All
Prescriptions		190,174	2,378,257	107,808,365
Milligrams		286,719,869	3,187,313,908	153,723,010,607
Cash		$4,781,948	$32,766,505	$937,270,157
Cash/Prescription		$25	$14	$9

Table B.3b Five-Year Stability Sample, State Attribution, Unduplicated, 2009 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	1	10
BUPRENORPHINE	1,502	4,507,388	19,129	63,098,633	2,784,121	7,052,973,232
BUTORPHANOL_TARTRATE	1,237	281,827	9,279	2,509,207	272,745	85,282,902
CODEINE	4,289	1,704,376	65,147	23,627,359	3,287,220	1,236,119,625
DIHYDROCODONE	54	41,276	578	299,079	27,843	12,909,506
FENTANYL	11,015	1,269,328	136,016	15,214,987	4,393,397	532,771,747
HYDROCODONE	60,565	36,925,384	804,833	469,499,404	44,780,345	29,507,180,033
HYDROMORPHONE	5,285	7,689,308	60,910	89,842,215	1,530,076	2,894,806,504
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	28	68,253	7,590	29,901,033
MEPERIDINE	522	151,772	8,347	2,356,959	308,615	101,364,047
METHADONE_HCL	3,988	17,769,923	55,764	237,812,450	3,020,697	14,875,061,641
MORPHINE	9,849	26,089,313	139,365	384,738,819	5,683,367	18,232,588,891
OXYCODONE	67,602	173,334,413	746,988	1,629,152,682	25,887,793	65,861,747,722
OXYMORPHONE_HCL	981	3,626,183	18,036	73,667,670	661,582	2,891,724,568
PENTAZOCINE	72	82,129	1,615	1,748,944	103,092	139,057,059
PROPOXYPHENE	4,228	3,758,283	77,961	71,603,744	4,894,866	4,955,473,865
REMIFENTANIL_HCL	0	0	0	0	7	63
SUFENTANIL_CITRATE	0	0	0	0	1	1
TAPENTADOL_HCL	121	250,044	2,428	5,555,141	79,199	174,326,413
TRAMADOL_HCL	18,863	9,238,922	231,834	116,518,362	10,085,809	5,139,721,744
Sum	190,174	286,719,869	2,378,257	3,187,313,908	107,808,365	153,723,010,606
Checksum	190,174	286,719,869	2,378,257	3,187,313,908	107,808,365	153,723,010,607

Table B.4a Five-Year Stability Sample, State Attribution, Unduplicated, 2010 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0589%	0.8288%	42.3072%
Milligrams		0.0574%	0.7194%	41.2579%
Cash		0.1415%	1.0991%	38.4097%
Cash/Total | Contingency		30.1149%	20.1437%	13.4882%

		Lower	Upper	All
Prescriptions		153,894	2,163,692	110,450,806
Milligrams		230,061,353	2,882,055,978	165,285,056,217
Cash		$4,296,248	$33,364,214	$1,165,965,038
Cash/Prescription		$28	$15	$11

Table B.4b Five-Year Stability Sample, State Attribution, Unduplicated, 2010 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	25	466
BUPRENORPHINE	1,333	4,323,595	18,577	58,980,998	3,303,940	8,375,878,357
BUTORPHANOL_TARTRATE	450	101,074	6,869	1,711,843	253,605	79,449,759
CODEINE	3,379	1,171,091	55,420	19,487,662	2,985,925	1,137,699,798
DIHYDROCODONE	21	7,961	364	155,529	23,816	11,138,000
FENTANYL	8,799	936,710	119,975	12,731,011	4,385,916	525,322,538
HYDROCODONE	48,812	29,971,729	713,459	416,615,784	44,363,199	30,411,286,845
HYDROMORPHONE	4,658	7,220,272	58,630	84,488,172	1,665,260	3,229,500,030
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	7	14,702	11	22,274	1,481	5,885,281
MEPERIDINE	167	73,379	5,864	1,746,500	259,555	87,440,803
METHADONE_HCL	2,988	11,391,139	48,768	201,387,271	3,077,461	14,905,524,846
MORPHINE	8,299	22,635,075	130,533	338,828,532	6,143,195	19,542,340,244
OXYCODONE	54,730	135,097,303	698,072	1,482,846,566	28,138,072	72,755,895,397
OXYMORPHONE_HCL	1,448	5,741,451	20,000	80,396,749	852,168	3,855,202,486
PENTAZOCINE	121	84,719	1,335	1,468,921	93,374	131,319,127
PROPOXYPHENE	2,774	2,626,681	56,540	52,176,122	3,905,856	4,026,947,995
REMIFENTANIL_HCL	0	0	0	0	8	62
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	330	862,581	7,047	15,698,808	293,123	697,555,507
TRAMADOL_HCL	15,577	7,801,891	222,229	113,313,236	10,704,828	5,506,668,675
Sum	153,894	230,061,353	2,163,692	2,882,055,978	110,450,806	165,285,056,219
Checksum	153,894	230,061,353	2,163,692	2,882,055,978	110,450,806	165,285,056,217

Table B.5a Five-Year Stability Sample, State Attribution, Unduplicated, 2011 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0520%	0.7838%	42.5169%
Milligrams		0.0497%	0.6749%	41.4206%
Cash		0.1094%	0.9115%	38.1384%
Cash/Total | Contingency		28.7806%	17.5463%	13.0094%

		Lower	Upper	All
Prescriptions		136,731	2,059,699	111,731,428
Milligrams		200,162,035	2,718,143,561	166,825,356,673
Cash		$3,186,330	$26,556,803	$1,111,138,056
Cash/Prescription		$23	$13	$10

Table B.5b Five-Year Stability Sample, State Attribution, Unduplicated, 2011 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	32	568
BUPRENORPHINE	1,070	2,362,809	23,077	57,637,916	4,156,469	9,885,710,871
BUTORPHANOL_TARTRATE	618	150,960	6,638	1,817,560	233,583	70,612,922
CODEINE	3,097	1,240,111	53,403	18,507,295	3,044,594	1,149,557,842
DIHYDROCODONE	54	22,927	385	159,248	26,873	11,533,835
FENTANYL	7,939	730,696	119,820	12,309,842	4,456,298	523,313,741
HYDROCODONE	43,512	27,106,735	681,743	404,408,484	45,282,191	31,456,638,115
HYDROMORPHONE	4,503	7,808,458	62,198	95,714,837	1,923,978	3,813,140,922
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	0	0	340	1,446,861
MEPERIDINE	108	23,644	4,820	1,486,133	219,510	76,569,203
METHADONE_HCL	2,688	10,135,514	46,449	181,640,634	3,100,845	14,619,372,346
MORPHINE	8,130	22,720,594	134,843	349,958,714	6,609,034	20,568,525,877
OXYCODONE	46,761	110,116,731	649,486	1,318,694,855	28,592,610	70,896,213,659
OXYMORPHONE_HCL	1,790	8,479,857	29,247	130,557,515	1,273,053	6,234,195,935
PENTAZOCINE	60	72,525	1,519	1,829,747	110,790	149,004,214
PROPOXYPHENE	0	0	48	100,956	3,272	7,347,814
REMIFENTANIL_HCL	0	0	0	0	1	10
SUFENTANIL_CITRATE	0	0	0	0	2	2
TAPENTADOL_HCL	593	1,399,853	11,093	25,980,401	497,581	1,200,589,758
TRAMADOL_HCL	15,808	7,790,619	234,930	117,339,425	12,200,374	6,161,582,177
Sum	136,731	200,162,035	2,059,699	2,718,143,561	111,731,428	166,825,356,673
Checksum	136,731	200,162,035	2,059,699	2,718,143,561	111,731,428	166,825,356,673

Table B.6a Five-Year Stability Sample, State Attribution, Unduplicated, 2012 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0459%	0.7770%	43.3647%
Milligrams		0.0389%	0.6324%	41.3748%
Cash		0.0887%	0.7460%	38.3471%
Cash/Total | Contingency		23.4207%	13.4197%	11.8016%

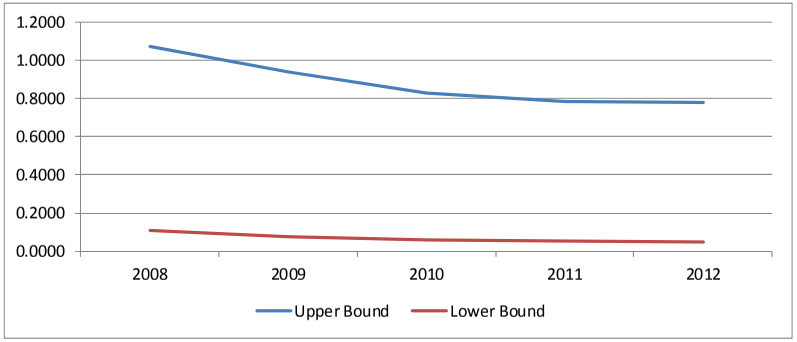
		Lower	Upper	All
Prescriptions		121,989	2,064,139	115,195,588
Milligrams		156,906,880	2,547,939,688	166,710,748,429
Cash		$2,317,299	$19,496,181	$1,002,192,287
Cash/Prescription		$19	$9	$9

Table B.6b Five-Year Stability Sample, State Attribution, Unduplicated, 2012 (Prescriptions, Milligrams X Drug)

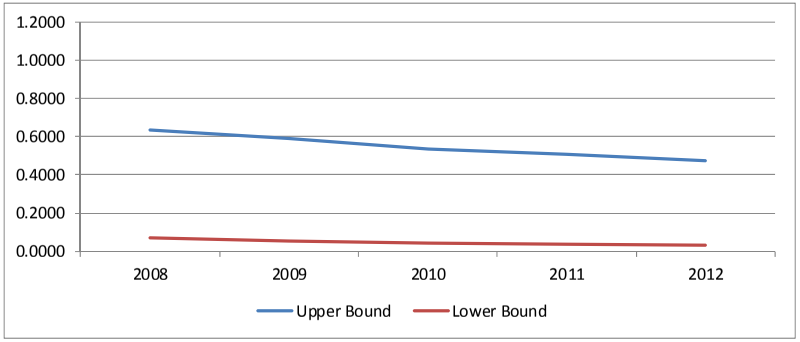
	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	39	1,349
BUPRENORPHINE	1,510	2,831,063	28,471	53,222,816	5,196,970	11,798,743,406
BUTORPHANOL_TARTRATE	832	180,712	7,157	2,082,141	218,473	66,487,351
CODEINE	2,575	963,372	50,385	16,160,936	2,797,276	1,044,222,378
DIHYDROCODONE	21	6,030	254	84,716	20,530	8,801,983
FENTANYL	8,073	840,537	125,618	12,668,167	4,534,122	520,289,535
HYDROCODONE	36,112	23,019,392	668,246	402,272,812	45,791,404	32,037,075,853
HYDROMORPHONE	4,683	7,084,488	68,066	97,619,878	2,206,796	4,472,465,038
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	18	36,747	2,642	9,754,336
MEPERIDINE	125	27,912	3,131	915,927	184,786	62,513,302
METHADONE_HCL	2,428	9,286,743	45,785	168,903,998	3,019,792	13,540,488,323
MORPHINE	7,852	17,762,989	144,162	353,077,836	7,144,992	21,334,719,415
OXYCODONE	40,049	77,806,711	626,013	1,176,334,258	28,842,630	68,674,739,957
OXYMORPHONE_HCL	1,257	7,513,457	22,889	104,465,311	994,325	4,652,056,372
PENTAZOCINE	34	18,728	1,192	1,207,223	96,691	128,365,328
PROPOXYPHENE	0	0	0	0	43	39,418
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	0	0	0	0	1	8
TAPENTADOL_HCL	762	2,195,862	14,429	35,446,264	647,498	1,718,473,384
TRAMADOL_HCL	15,677	7,368,882	258,323	123,440,659	13,496,579	6,641,511,692
Sum	121,989	156,906,880	2,064,139	2,547,939,688	115,195,588	166,710,748,428
Checksum	121,989	156,906,880	2,064,139	2,547,939,688	115,195,588	166,710,748,429

Table B.7 Five-Year Stability Sample, State Attribution, Unduplicated Trend

	Upper Bound Prescriptions (%)	Lower Bound Prescriptions (%)	Upper Bound Prescriptions (n)	Lower Bound Prescriptions (n)
2008	1.0727	0.1061	2,631,243	260,188
2009	0.9414	0.0753	2,378,257	190,174
2010	0.8288	0.0589	2,163,692	153,894
2011	0.7838	0.0520	2,059,699	136,731
2012	0.7770	0.0459	2,064,139	121,989



	Upper Bound Milligrams (%)	Lower Bound Milligrams (%)	Upper Bound Milligrams (n)	Lower Bound Milligrams (n)
2008	0.6374	0.0712	3,426,740,277	382,797,393
2009	0.5928	0.0533	3,187,313,908	286,719,869
2010	0.5361	0.0428	2,882,055,978	230,061,353
2011	0.5056	0.0372	2,718,143,561	200,162,035
2012	0.4739	0.0292	2,547,939,688	156,906,880



Appendix C

Five-Year Stability Sample, Zip-Three Attribution, Duplicated:

2008-2012

Table C.1a Base Year Sample, Zip-Three Attribution, Duplicated (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	35.6857%	3.3556%	0.1579%	0.0083%	0.0008%	0.0001%
Milligrams		57.4378%	6.9987%	0.4542%	0.0262%	0.0022%	0.0004%
Cash		56.1395%	6.6269%	0.5055%	0.0517%	0.0089%	0.0020%
Cash/Total | Contingency		6.9039%	6.8144%	7.4839%	13.1016%	33.3530%	40.6794%
Prescriptions	2	10.5538%	2.8561%	0.1640%	0.0100%	0.0008%	0.0002%
Milligrams		12.2772%	3.5201%	0.3002%	0.0210%	0.0019%	0.0006%
Cash		9.6853%	5.8804%	0.6115%	0.0590%	0.0088%	0.0047%
Cash/Total | Contingency		5.5857%	12.0574%	13.9004%	18.2681%	32.9770%	70.3840%
Prescriptions	3	0.5595%	0.2826%	0.0943%	0.0090%	0.0008%	0.0002%
Milligrams		0.6498%	0.3479%	0.1196%	0.0140%	0.0015%	0.0003%
Cash		0.6982%	0.6401%	0.4415%	0.0579%	0.0080%	0.0018%
Cash/Total | Contingency		6.7185%	12.4745%	26.0470%	28.7984%	36.1415%	40.6873%
Prescriptions	4	0.0224%	0.0174%	0.0103%	0.0059%	0.0011%	0.0002%
Milligrams		0.0289%	0.0227%	0.0128%	0.0072%	0.0017%	0.0003%
Cash		0.0379%	0.0662%	0.0483%	0.0454%	0.0087%	0.0042%
Cash/Total | Contingency		7.6545%	18.8789%	25.4744%	34.1562%	32.0377%	56.4028%
Prescriptions	5	0.0009%	0.0008%	0.0008%	0.0008%	0.0008%	0.0003%
Milligrams		0.0027%	0.0013%	0.0009%	0.0008%	0.0011%	0.0004%
Cash		0.0028%	0.0031%	0.0017%	0.0067%	0.0072%	0.0024%
Cash/Total | Contingency		9.2603%	15.3344%	17.9511%	39.5830%	30.5168%	34.7439%
Prescriptions	6	0.0001%	0.0000%	0.0001%	0.0001%	0.0002%	0.0002%
Milligrams		0.0008%	0.0000%	0.0001%	0.0001%	0.0001%	0.0002%
Cash		0.0005%	0.0000%	0.0001%	0.0006%	0.0014%	0.0023%
Cash/Total | Contingency		14.8992%	0.0000%	23.6311%	51.8375%	33.2069%	45.0432%

Table C.1b Base Year Sample, Zip-Three Attribution, Duplicated (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	94,488,051	8,884,902	418,000	21,858	2,091	323
Milligrams		148,054,526,549	18,040,179,263	1,170,667,670	67,603,042	5,613,845	935,668
Cash		$517,683,141	$61,109,256	$4,661,147	$477,138	$81,894	$18,493
Cash/Prescription		$5	$7	$11	$22	$39	$57
Prescriptions	2	27,944,216	7,562,375	434,119	26,460	2,211	639
Milligrams		31,646,266,847	9,073,513,394	773,864,583	54,100,031	4,869,236	1,581,045
Cash		$89,311,529	$54,225,407	$5,638,767	$543,843	$81,205	$43,665
Cash/Prescription		$3	$7	$13	$21	$37	$68
Prescriptions	3	1,481,485	748,294	249,694	23,871	2,130	508
Milligrams		1,674,876,159	896,871,159	308,218,831	36,206,093	3,971,703	719,755
Cash		$6,438,325	$5,902,267	$4,071,290	$533,502	$73,705	$16,226
Cash/Prescription		$4	$8	$16	$22	$35	$32
Prescriptions	4	59,400	45,997	27,209	15,576	2,818	454
Milligrams		74,523,819	58,542,430	33,026,487	18,478,988	4,281,707	647,615
Cash		$349,661	$610,682	$445,269	$418,599	$79,840	$39,160
Cash/Prescription		$6	$13	$16	$27	$28	$86
Prescriptions	5	2,468	2,232	2,171	2,110	2,076	663
Milligrams		6,865,748	3,356,737	2,250,642	2,175,386	2,817,876	980,202
Cash		$25,451	$28,882	$15,689	$62,181	$66,401	$22,538
Cash/Prescription		$10	$13	$7	$29	$32	$34
Prescriptions	6	359	61	232	309	498	538
Milligrams		2,121,797	38,107	149,315	242,051	347,243	421,139
Cash		$4,366	$0	$895	$5,561	$12,778	$20,760
Cash/Prescription		$12	$0	$4	$18	$26	$39

Table C.2a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2008 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	32.0063%	1.2955%	0.0478%	0.0053%	0.0014%	0.0008%
Milligrams		33.9561%	1.5474%	0.0740%	0.0090%	0.0025%	0.0008%
Cash		29.9493%	2.4440%	0.2234%	0.0358%	0.0108%	0.0050%
Cash/Total | Contingency		10.7512%	19.5492%	34.7896%	55.1808%	70.4650%	78.2679%
Prescriptions	2	9.5568%	1.7385%	0.0783%	0.0060%	0.0010%	0.0004%
Milligrams		7.6690%	1.4490%	0.0866%	0.0086%	0.0021%	0.0010%
Cash		5.4659%	3.5058%	0.2523%	0.0318%	0.0074%	0.0041%
Cash/Total | Contingency		8.4477%	31.1470%	36.0754%	49.6382%	50.2816%	72.5276%
Prescriptions	3	0.6090%	0.1879%	0.1065%	0.0100%	0.0015%	0.0004%
Milligrams		0.5262%	0.1787%	0.0926%	0.0115%	0.0028%	0.0015%
Cash		0.4000%	0.3687%	0.3859%	0.0438%	0.0071%	0.0027%
Cash/Total | Contingency		7.9089%	25.3731%	54.1511%	50.9411%	46.0734%	55.8285%
Prescriptions	4	0.0358%	0.0143%	0.0129%	0.0158%	0.0025%	0.0006%
Milligrams		0.0337%	0.0145%	0.0147%	0.0139%	0.0027%	0.0005%
Cash		0.0340%	0.0279%	0.0612%	0.0689%	0.0102%	0.0018%
Cash/Total | Contingency		10.5171%	24.0436%	51.2013%	62.3785%	55.7356%	38.5958%
Prescriptions	5	0.0028%	0.0017%	0.0014%	0.0025%	0.0035%	0.0011%
Milligrams		0.0024%	0.0025%	0.0018%	0.0031%	0.0030%	0.0012%
Cash		0.0026%	0.0057%	0.0065%	0.0171%	0.0181%	0.0062%
Cash/Total | Contingency		9.9955%	31.3782%	35.1154%	65.4669%	67.1363%	79.9874%
Prescriptions	6	0.0002%	0.0001%	0.0004%	0.0005%	0.0008%	0.0023%
Milligrams		0.0002%	0.0003%	0.0004%	0.0006%	0.0008%	0.0017%
Cash		0.0002%	0.0005%	0.0015%	0.0025%	0.0048%	0.0097%
Cash/Total | Contingency		9.3775%	20.1794%	38.2029%	39.8133%	52.4526%	79.5669%

Table C.2b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2008 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	77,040,045	3,118,266	115,154	12,679	3,445	1,959
Milligrams		113,394,855,279	5,167,526,463	246,972,731	30,072,562	8,408,519	2,812,830
Cash		$687,257,421	$56,084,215	$5,126,705	$822,262	$248,662	$114,227
Cash/Prescription		$9	$18	$45	$65	$72	$58
Prescriptions	2	23,003,507	4,184,520	188,571	14,495	2,358	1,038
Milligrams		25,610,271,431	4,838,895,944	289,204,441	28,736,526	6,929,170	3,206,744
Cash		$125,427,369	$80,449,595	$5,790,326	$729,946	$169,753	$93,836
Cash/Prescription		$5	$19	$31	$50	$72	$90
Prescriptions	3	1,465,968	452,248	256,445	24,138	3,654	985
Milligrams		1,757,238,877	596,690,881	309,117,545	38,423,690	9,385,665	4,944,876
Cash		$9,179,270	$8,460,390	$8,855,564	$1,004,463	$163,798	$61,641
Cash/Prescription		$6	$19	$35	$42	$45	$63
Prescriptions	4	86,102	34,391	31,151	37,991	5,923	1,403
Milligrams		112,525,687	48,289,814	49,176,091	46,570,304	8,862,842	1,700,975
Cash		$779,976	$639,108	$1,404,404	$1,581,882	$233,211	$41,114
Cash/Prescription		$9	$19	$45	$42	$39	$29
Prescriptions	5	6,634	4,158	3,419	5,976	8,515	2,562
Milligrams		7,959,619	8,214,325	6,156,562	10,270,646	9,984,853	3,879,083
Cash		$60,068	$130,458	$148,223	$392,360	$416,220	$143,324
Cash/Prescription		$9	$31	$43	$66	$49	$56
Prescriptions	6	401	330	847	1,172	1,907	5,638
Milligrams		589,076	841,298	1,438,292	1,939,168	2,734,764	5,792,201
Cash		$4,306	$10,336	$35,226	$56,804	$109,488	$221,709
Cash/Prescription		$11	$31	$42	$48	$57	$39

Table C.3a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2009 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	32.4053%	1.2568%	0.0428%	0.0049%	0.0010%	0.0003%
Milligrams		34.1615%	1.5752%	0.0678%	0.0082%	0.0021%	0.0004%
Cash		30.2331%	2.0172%	0.1515%	0.0287%	0.0077%	0.0007%
Cash/Total | Contingency		10.7270%	15.7378%	26.0166%	43.3484%	56.3001%	31.4437%
Prescriptions	2	9.4030%	1.5426%	0.0642%	0.0044%	0.0008%	0.0003%
Milligrams		7.4216%	1.3014%	0.0769%	0.0059%	0.0014%	0.0004%
Cash		5.5622%	2.8202%	0.1988%	0.0176%	0.0039%	0.0006%
Cash/Total | Contingency		8.8669%	26.9523%	29.4716%	33.9787%	45.3528%	29.5543%
Prescriptions	3	0.5598%	0.1614%	0.0699%	0.0059%	0.0009%	0.0003%
Milligrams		0.4677%	0.1495%	0.0634%	0.0069%	0.0011%	0.0009%
Cash		0.4123%	0.3031%	0.2357%	0.0262%	0.0047%	0.0015%
Cash/Total | Contingency		8.8246%	23.6987%	43.4432%	43.4170%	46.4135%	64.5764%
Prescriptions	4	0.0296%	0.0119%	0.0088%	0.0071%	0.0011%	0.0002%
Milligrams		0.0267%	0.0119%	0.0105%	0.0065%	0.0010%	0.0006%
Cash		0.0316%	0.0251%	0.0305%	0.0303%	0.0045%	0.0017%
Cash/Total | Contingency		10.6413%	23.1819%	32.9098%	52.9904%	54.8009%	89.4621%
Prescriptions	5	0.0021%	0.0008%	0.0009%	0.0012%	0.0016%	0.0004%
Milligrams		0.0019%	0.0010%	0.0008%	0.0016%	0.0013%	0.0003%
Cash		0.0037%	0.0030%	0.0026%	0.0088%	0.0085%	0.0013%
Cash/Total | Contingency		11.7157%	33.0344%	33.8951%	52.3136%	74.2942%	82.0196%
Prescriptions	6	0.0008%	0.0001%	0.0002%	0.0002%	0.0002%	0.0008%
Milligrams		0.0009%	0.0002%	0.0001%	0.0003%	0.0002%	0.0009%
Cash		0.0001%	0.0013%	0.0004%	0.0011%	0.0007%	0.0056%
Cash/Total | Contingency		1.5296%	52.7229%	30.3549%	30.7539%	61.2451%	85.7643%

Table C.3b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2009 (Number)

Pharmacies		1	2	3	4	5	6
Doctors							
Prescriptions	1	80,306,314	3,114,565	105,974	12,109	2,458	653
Milligrams		122,980,397,606	5,670,782,130	244,032,863	29,648,952	7,514,171	1,369,091
Cash		$717,929,030	$47,901,998	$3,597,815	$680,961	$183,826	$16,471
Cash/Prescription		$9	$15	$34	$56	$75	$25
Prescriptions	2	23,302,373	3,822,937	159,077	10,971	1,994	686
Milligrams		26,717,542,425	4,684,831,460	276,717,803	21,120,032	5,010,825	1,297,550
Cash		$132,083,220	$66,970,456	$4,719,628	$418,732	$91,466	$14,302
Cash/Prescription		$6	$18	$30	$38	$46	$21
Prescriptions	3	1,387,209	400,075	173,269	14,684	2,149	639
Milligrams		1,683,577,342	538,285,163	228,129,590	24,891,328	4,102,332	3,075,978
Cash		$9,790,923	$7,197,882	$5,598,050	$621,383	$112,671	$34,936
Cash/Prescription		$7	$18	$32	$42	$52	$55
Prescriptions	4	73,296	29,586	21,874	17,662	2,716	616
Milligrams		96,260,836	42,712,847	37,897,912	23,376,468	3,779,523	2,003,596
Cash		$750,425	$595,452	$723,084	$719,671	$105,998	$40,432
Cash/Prescription		$10	$20	$33	$41	$39	$66
Prescriptions	5	5,287	1,995	2,264	2,919	4,084	917
Milligrams		6,937,850	3,601,137	2,767,638	5,912,310	4,718,705	1,228,921
Cash		$87,377	$72,131	$61,267	$209,084	$202,409	$32,049
Cash/Prescription		$17	$36	$27	$72	$50	$35
Prescriptions	6	1,865	254	419	477	466	2,023
Milligrams		3,315,647	806,584	464,217	1,113,022	667,986	3,219,036
Cash		$3,050	$30,906	$8,793	$25,360	$16,057	$131,810
Cash/Prescription		$2	$122	$21	$53	$34	$65

Table C.4a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2010 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	32.4792%	1.1703%	0.0341%	0.0030%	0.0007%	0.0003%
Milligrams		34.6030%	1.4399%	0.0525%	0.0044%	0.0016%	0.0012%
Cash		30.8074%	1.5594%	0.0968%	0.0165%	0.0064%	0.0060%
Cash/Total | Contingency		13.1238%	16.0540%	26.1478%	53.6060%	65.7874%	88.2015%
Prescriptions	2	9.1998%	1.3391%	0.0506%	0.0034%	0.0005%	0.0001%
Milligrams		7.1493%	1.1202%	0.0562%	0.0049%	0.0010%	0.0004%
Cash		4.9955%	2.4939%	0.1510%	0.0150%	0.0045%	0.0017%
Cash/Total | Contingency		10.3444%	32.1260%	36.0861%	46.3175%	68.7932%	66.4512%
Prescriptions	3	0.5255%	0.1355%	0.0527%	0.0039%	0.0004%	0.0001%
Milligrams		0.4244%	0.1203%	0.0461%	0.0038%	0.0006%	0.0000%
Cash		0.3221%	0.2739%	0.1995%	0.0131%	0.0014%	0.0001%
Cash/Total | Contingency		10.3001%	30.4177%	55.3498%	43.6585%	39.7362%	65.3742%
Prescriptions	4	0.0264%	0.0094%	0.0061%	0.0050%	0.0006%	0.0000%
Milligrams		0.0241%	0.0085%	0.0054%	0.0038%	0.0005%	0.0000%
Cash		0.0199%	0.0198%	0.0247%	0.0169%	0.0021%	0.0001%
Cash/Total | Contingency		10.1391%	29.1017%	56.0399%	56.8421%	55.1706%	95.2798%
Prescriptions	5	0.0016%	0.0006%	0.0006%	0.0008%	0.0010%	0.0001%
Milligrams		0.0016%	0.0007%	0.0006%	0.0006%	0.0006%	0.0001%
Cash		0.0007%	0.0030%	0.0035%	0.0021%	0.0029%	0.0003%
Cash/Total | Contingency		4.7001%	41.2997%	64.5694%	50.3068%	46.8086%	36.9995%
Prescriptions	6	0.0002%	0.0000%	0.0000%	0.0000%	0.0002%	0.0002%
Milligrams		0.0004%	0.0000%	0.0000%	0.0001%	0.0001%	0.0003%
Cash		0.0009%	0.0000%	0.0001%	0.0000%	0.0005%	0.0014%
Cash/Total | Contingency		24.1658%	0.0000%	61.7856%	3.2009%	49.6249%	46.7763%

Table C.4b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2010 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	83,167,201	2,996,807	87,233	7,738	1,767	695
Milligrams		134,600,877,436	5,600,924,237	204,310,351	16,965,320	6,369,123	4,573,086
Cash		$930,991,997	$47,123,667	$2,925,930	$498,817	$194,470	$181,949
Cash/Prescription		$11	$16	$34	$64	$110	$262
Prescriptions	2	23,557,171	3,429,041	129,668	8,624	1,248	330
Milligrams		27,809,608,215	4,357,250,046	218,666,177	18,963,371	4,069,297	1,420,741
Cash		$150,962,305	$75,365,086	$4,563,464	$454,389	$135,324	$50,506
Cash/Prescription		$6	$22	$35	$53	$108	$153
Prescriptions	3	1,345,536	346,911	134,899	10,097	1,064	142
Milligrams		1,651,040,185	467,917,784	179,458,069	14,940,300	2,219,482	95,459
Cash		$9,732,748	$8,278,453	$6,030,311	$394,841	$41,545	$1,929
Cash/Prescription		$7	$24	$45	$39	$39	$14
Prescriptions	4	67,494	24,096	15,672	12,763	1,533	87
Milligrams		93,617,484	32,896,059	21,129,751	14,636,898	1,780,273	44,326
Cash		$601,832	$599,445	$746,010	$510,718	$63,123	$1,601
Cash/Prescription		$9	$25	$48	$40	$41	$18
Prescriptions	5	4,023	1,523	1,493	1,928	2,604	164
Milligrams		6,195,580	2,846,235	2,411,901	2,204,332	2,388,820	276,756
Cash		$20,721	$89,769	$105,910	$63,868	$87,525	$10,186
Cash/Prescription		$5	$59	$71	$33	$34	$62
Prescriptions	6	495	19	97	108	391	623
Milligrams		1,513,326	58,331	46,690	255,173	511,692	997,316
Cash		$27,066	$0	$4,404	$250	$15,026	$43,702
Cash/Prescription		$55	$0	$46	$2	$38	$70

Table C.5a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2011 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	32.8406%	1.1928%	0.0340%	0.0026%	0.0004%	0.0005%
Milligrams		34.9394%	1.4849%	0.0532%	0.0038%	0.0003%	0.0003%
Cash		31.1886%	1.4519%	0.0758%	0.0097%	0.0011%	0.0008%
Cash/Total | Contingency		12.6453%	14.8940%	20.7614%	35.3335%	46.3658%	35.2964%
Prescriptions	2	9.1892%	1.2527%	0.0447%	0.0026%	0.0004%	0.0001%
Milligrams		7.0833%	1.0072%	0.0506%	0.0040%	0.0007%	0.0001%
Cash		5.1503%	2.2266%	0.1207%	0.0169%	0.0049%	0.0002%
Cash/Total | Contingency		10.1813%	31.1183%	32.6244%	56.1833%	79.1295%	47.2362%
Prescriptions	3	0.5037%	0.1234%	0.0457%	0.0030%	0.0004%	0.0000%
Milligrams		0.4044%	0.1056%	0.0385%	0.0033%	0.0005%	0.0000%
Cash		0.2948%	0.2195%	0.1717%	0.0153%	0.0017%	0.0000%
Cash/Total | Contingency		9.5453%	27.9505%	54.0020%	61.7160%	49.6281%	41.2217%
Prescriptions	4	0.0239%	0.0084%	0.0053%	0.0046%	0.0006%	0.0000%
Milligrams		0.0225%	0.0068%	0.0048%	0.0036%	0.0005%	0.0000%
Cash		0.0160%	0.0141%	0.0179%	0.0150%	0.0016%	0.0002%
Cash/Total | Contingency		8.9667%	27.9268%	50.0715%	62.4268%	53.3369%	60.4630%
Prescriptions	5	0.0011%	0.0004%	0.0004%	0.0007%	0.0009%	0.0002%
Milligrams		0.0013%	0.0003%	0.0003%	0.0008%	0.0008%	0.0003%
Cash		0.0013%	0.0007%	0.0009%	0.0027%	0.0020%	0.0009%
Cash/Total | Contingency		16.6069%	36.6143%	50.6258%	64.5463%	49.9947%	56.7600%
Prescriptions	6	0.0001%		0.0000%	0.0001%	0.0002%	0.0003%
Milligrams		0.0000%		0.0000%	0.0001%	0.0001%	0.0001%
Cash		0.0001%		0.0001%	0.0002%	0.0002%	0.0004%
Cash/Total | Contingency		19.7878%		87.7116%	41.6617%	33.7024%	39.7594%

Table C.5b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2011 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	84,633,776	3,073,989	87,493	6,573	1,130	1,209
Milligrams		136,848,091,637	5,815,954,175	208,426,719	14,880,296	1,044,151	989,033
Cash		$894,777,853	$41,654,297	$2,175,421	$279,207	$32,408	$22,608
Cash/Prescription		$11	$14	$25	$42	$29	$19
Prescriptions	2	23,681,535	3,228,467	115,164	6,722	1,142	293
Milligrams		27,743,179,869	3,944,813,850	198,262,437	15,531,633	2,576,408	345,424
Cash		$147,759,549	$63,879,129	$3,463,362	$484,525	$140,881	$6,916
Cash/Prescription		$6	$20	$30	$72	$123	$24
Prescriptions	3	1,298,180	317,893	117,684	7,855	1,008	56
Milligrams		1,584,030,392	413,465,227	150,833,752	13,058,426	2,003,158	31,773
Cash		$8,458,156	$6,297,883	$4,926,553	$437,817	$50,016	$427
Cash/Prescription		$7	$20	$42	$56	$50	$8
Prescriptions	4	61,501	21,572	13,753	11,855	1,605	118
Milligrams		88,107,422	26,766,985	18,708,746	14,057,296	2,050,562	176,021
Cash		$458,639	$403,652	$513,308	$430,954	$44,996	$4,773
Cash/Prescription		$7	$19	$37	$36	$28	$40
Prescriptions	5	2,828	1,118	934	1,859	2,410	637
Milligrams		5,154,786	1,129,739	982,349	3,048,032	3,265,249	1,232,023
Cash		$35,871	$19,876	$24,556	$77,511	$56,481	$24,892
Cash/Prescription		$13	$18	$26	$42	$23	$39
Prescriptions	6	154		48	205	538	768
Milligrams		149,537		44,558	256,003	488,030	436,621
Cash		$2,124		$1,831	$5,140	$6,611	$10,459
Cash/Prescription		$14		$38	$25	$12	$14

Table C.6a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2012 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	33.4344%	1.2190%	0.0319%	0.0017%	0.0003%	0.0001%
Milligrams		34.8415%	1.5612%	0.0521%	0.0027%	0.0004%	0.0001%
Cash		32.2452%	1.1979%	0.0625%	0.0165%	0.0005%	0.0001%
Cash/Total | Contingency		11.8602%	10.6859%	15.4009%	53.3807%	28.3587%	19.2939%
Prescriptions	2	9.6087%	1.1478%	0.0370%	0.0024%	0.0003%	0.0000%
Milligrams		7.2445%	0.8818%	0.0401%	0.0029%	0.0003%	0.0000%
Cash		5.5355%	1.2760%	0.0699%	0.0106%	0.0017%	0.0002%
Cash/Total | Contingency		9.6661%	19.4603%	22.7059%	43.5115%	55.4146%	84.9733%
Prescriptions	3	0.5273%	0.1161%	0.0339%	0.0025%	0.0006%	0.0001%
Milligrams		0.4062%	0.0902%	0.0246%	0.0024%	0.0007%	0.0002%
Cash		0.4162%	0.1260%	0.0786%	0.0084%	0.0045%	0.0013%
Cash/Total | Contingency		11.3017%	17.6009%	39.0539%	46.4255%	78.6207%	95.5649%
Prescriptions	4	0.0241%	0.0077%	0.0044%	0.0029%	0.0003%	0.0000%
Milligrams		0.0200%	0.0063%	0.0033%	0.0021%	0.0003%	0.0000%
Cash		0.0244%	0.0333%	0.0100%	0.0106%	0.0007%	0.0002%
Cash/Total | Contingency		12.3610%	42.2983%	35.6076%	50.4225%	40.3245%	87.6324%
Prescriptions	5	0.0007%	0.0004%	0.0005%	0.0004%	0.0006%	0.0001%
Milligrams		0.0007%	0.0004%	0.0004%	0.0003%	0.0004%	0.0000%
Cash		0.0015%	0.0017%	0.0019%	0.0005%	0.0024%	0.0000%
Cash/Total | Contingency		23.0379%	42.6053%	58.6566%	31.6706%	69.5741%	17.0151%
Prescriptions	6	0.0001%	0.0000%	0.0000%	0.0001%	0.0002%	0.0004%
Milligrams		0.0001%	0.0000%	0.0000%	0.0000%	0.0001%	0.0002%
Cash		0.0000%	0.0000%	0.0000%	0.0001%	0.0003%	0.0004%
Cash/Total | Contingency		4.1568%	10.6686%	60.4409%	26.9848%	47.0818%	48.8705%

Table C.6b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, 2012 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	87,045,724	3,173,705	82,946	4,447	702	245
Milligrams		135,989,816,796	6,093,595,483	203,448,554	10,351,971	1,510,294	245,856
Cash		$833,409,980	$30,961,551	$1,615,573	$425,607	$14,039	$2,012
Cash/Prescription		$10	$10	$19	$96	$20	$8
Prescriptions	2	25,016,097	2,988,344	96,310	6,206	701	51
Milligrams		28,275,880,283	3,441,863,724	156,360,269	11,293,428	1,153,225	90,574
Cash		$143,071,401	$32,978,838	$1,807,859	$273,464	$43,106	$3,968
Cash/Prescription		$6	$11	$19	$44	$62	$77
Prescriptions	3	1,372,820	302,278	88,129	6,593	1,662	338
Milligrams		1,585,564,108	351,931,316	95,832,106	9,369,513	2,748,177	672,148
Cash		$10,758,133	$3,257,032	$2,031,338	$216,214	$117,049	$33,047
Cash/Prescription		$8	$11	$23	$33	$70	$98
Prescriptions	4	62,657	20,052	11,419	7,577	743	90
Milligrams		78,217,851	24,567,051	13,055,828	8,021,140	998,983	101,904
Cash		$630,279	$861,457	$258,910	$273,532	$16,830	$4,583
Cash/Prescription		$10	$43	$23	$36	$23	$51
Prescriptions	5	1,935	1,093	1,338	1,114	1,580	304
Milligrams		2,771,509	1,505,183	1,506,142	983,529	1,441,822	177,566
Cash		$37,737	$43,770	$48,435	$13,723	$60,935	$742
Cash/Prescription		$20	$40	$36	$12	$39	$2
Prescriptions	6	173	121	98	343	435	1,012
Milligrams		336,688	133,115	47,665	145,352	493,173	771,983
Cash		$955	$1,071	$1,243	$2,217	$6,661	$10,349
Cash/Prescription		$6	$9	$13	$6	$15	$10

Appendix D

Five-Year Stability Sample, Zip-Three Attribution, Unduplicated:

2008-2012

Table D.1a Base Year Sample, Zip-Three Attribution, Unduplicated (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0808%	1.2323%	48.2338%
Milligrams		0.1288%	1.8153%	72.0272%
Cash		0.3570%	2.8258%	72.2114%
Cash/Total | Contingency		17.6986%	10.2608%	7.1292%

		Lower	Upper	All
Prescriptions		213,980	3,262,813	127,712,567
Milligrams		332,079,196	4,679,201,824	185,660,812,012
Cash		$3,291,991	$26,058,130	$665,887,169
Cash/Prescription		$15	$8	$5

Table D.1b Base Year Sample, Zip-Three Attribution, Unduplicated (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	34	1,429
BUPRENORPHINE	3,352	6,737,787	61,623	123,643,194	5,542,642	13,283,588,834
BUTORPHANOL_TARTRATE	938	305,714	8,736	2,374,901	222,280	66,660,885
CODEINE	5,524	2,013,046	93,227	31,183,428	3,532,879	1,362,635,931
DIHYDROCODONE	8	2,025	387	138,929	18,358	7,682,212
FENTANYL	10,332	1,116,587	157,368	16,978,592	4,652,131	550,118,270
HYDROCODONE	66,270	44,588,044	1,068,958	672,292,112	52,165,759	37,414,910,541
HYDROMORPHONE	7,190	12,743,570	99,286	159,994,402	2,321,702	4,535,119,756
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	35	134,262	2,413	8,639,336
MEPERIDINE	313	81,637	5,515	1,499,772	202,238	67,151,850
METHADONE_HCL	3,999	18,155,932	69,890	295,103,683	3,105,608	14,108,268,044
MORPHINE	12,261	35,715,711	204,933	575,937,435	7,527,939	23,276,343,448
OXYCODONE	73,051	173,501,459	1,054,576	2,298,726,153	32,373,054	76,890,574,111
OXYMORPHONE_HCL	4,622	20,942,269	55,101	255,778,539	1,064,034	4,940,823,454
PENTAZOCINE	88	95,193	1,700	1,909,819	96,605	131,600,222
PROPOXYPHENE	0	0	0	0	24	28,830
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	1,395	3,683,909	25,640	65,069,319	686,884	1,816,441,167
TRAMADOL_HCL	24,637	12,396,314	355,838	178,437,282	14,197,983	7,200,223,692
Sum	213,980	332,079,196	3,262,813	4,679,201,824	127,712,567	185,660,812,012
Checksum	213,980	332,079,196	3,262,813	4,679,201,824	127,712,567	185,660,812,012

Table D.2a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2008 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.1014%	1.0343%	41.7923%
Milligrams		0.1060%	0.9556%	40.9158%
Cash		0.3073%	1.6391%	38.5311%
Cash/Total | Contingency		35.0829%	19.2299%	11.5325%

Check (11)	2008	0.001014
	2012	0.0005
		122.5438%
Projection		0.0018

		Lower	Upper	All
Prescriptions		244,095	2,489,616	100,595,338
Milligrams		354,085,819	3,191,067,173	136,636,286,366
Cash		$7,052,116	$37,611,959	$884,185,020
Cash/Prescription		$29	$15	$9

Table D.2b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2008 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	.	.
BUPRENORPHINE	1,402	4,464,947	16,523	55,097,018	1,897,515	5,126,461,980
BUTORPHANOL_TARTRATE	1,495	322,995	8,916	2,246,869	271,515	82,724,414
CODEINE	6,715	3,317,239	72,652	26,461,763	3,477,547	1,318,864,048
DIHYDROCODONE	45	16,365	918	337,693	30,679	12,988,065
FENTANYL	11,097	1,254,031	146,512	16,731,053	4,403,799	535,513,772
HYDROCODONE	92,815	61,856,225	907,569	548,360,927	42,171,463	27,092,783,417
HYDROMORPHONE	4,605	6,295,708	55,963	78,990,999	1,288,872	2,367,674,371
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	4	3,474	133	415,324	5,506	17,474,540
MEPERIDINE	712	297,482	11,072	2,942,162	424,273	120,898,011
METHADONE_HCL	4,642	20,105,147	59,699	258,357,326	2,844,595	13,960,553,969
MORPHINE	9,358	24,508,624	130,592	369,368,782	5,008,952	16,320,738,549
OXYCODONE	82,994	212,138,676	752,676	1,595,504,302	23,713,197	57,833,709,492
OXYMORPHONE_HCL	883	3,523,415	11,276	40,277,973	425,272	1,752,343,675
PENTAZOCINE	211	258,564	2,053	2,329,401	124,502	161,099,884
PROPOXYPHENE	6,040	5,779,580	91,693	84,893,183	5,437,557	5,405,628,746
REMIFENTANIL_HCL	0	0	0	0	1	20
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	.	.	.	.	.	.
TRAMADOL_HCL	21,077	9,943,346	221,370	108,752,399	9,070,091	4,526,829,414
Sum	244,095	354,085,819	2,489,616	3,191,067,173	100,595,338	136,636,286,367
Checksum	244,095	354,085,819	2,489,616	3,191,067,173	100,595,338	136,636,286,366

Table D.3a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2009 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0728%	0.8984%	41.8346%
Milligrams		0.0765%	0.8202%	40.8525%
Cash		0.1905%	1.3045%	38.0862%
Cash/Total | Contingency		26.0524%	16.9295%	11.3271%

		Lower	Upper	All
Prescriptions		180,379	2,226,457	103,673,882
Milligrams		275,281,645	2,952,533,764	147,067,960,172
Cash		$4,523,732	$30,976,823	$904,414,134
Cash/Prescription		$25	$14	$9

Table D.3b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2009 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	1	10
BUPRENORPHINE	2,327	10,013,885	19,265	69,886,130	2,622,478	7,020,132,438
BUTORPHANOL_TARTRATE	1,371	302,144	10,346	2,656,761	251,346	80,049,278
CODEINE	3,874	1,517,854	60,126	21,451,513	3,184,817	1,205,141,349
DIHYDROCODONE	39	27,761	399	196,703	21,380	9,067,782
FENTANYL	10,374	1,188,308	129,192	14,444,339	4,272,116	519,252,007
HYDROCODONE	58,841	36,698,244	756,241	444,469,262	43,038,244	28,457,375,897
HYDROMORPHONE	5,250	8,546,178	57,821	82,841,639	1,467,934	2,732,275,917
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	16	39,745	5,252	19,752,538
MEPERIDINE	520	173,930	7,995	2,397,327	290,807	93,865,146
METHADONE_HCL	3,917	17,542,938	53,155	222,117,478	2,933,095	14,225,889,458
MORPHINE	8,673	22,556,460	128,988	357,856,999	5,530,892	17,684,101,626
OXYCODONE	62,807	161,088,044	692,747	1,488,612,646	24,762,690	62,289,742,320
OXYMORPHONE_HCL	943	3,368,283	15,662	61,410,758	624,482	2,663,338,671
PENTAZOCINE	62	60,824	1,606	1,617,142	92,673	121,906,040
PROPOXYPHENE	3,876	3,519,019	72,933	67,200,768	4,731,747	4,806,945,530
REMIFENTANIL_HCL	0	0	0	0	7	63
SUFENTANIL_CITRATE	0	0	0	0	1	1
TAPENTADOL_HCL	121	260,871	2,269	5,492,585	73,277	156,123,768
TRAMADOL_HCL	17,385	8,416,903	217,698	109,841,968	9,770,644	4,983,000,333
Sum	180,379	275,281,645	2,226,457	2,952,533,764	103,673,882	147,067,960,171
Checksum	180,379	275,281,645	2,226,457	2,952,533,764	103,673,882	147,067,960,172

Table D.4a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2010 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0567%	0.7983%	41.5037%
Milligrams		0.0546%	0.6952%	40.9024%
Cash		0.1284%	1.0251%	37.5844%
Cash/Total | Contingency		29.8389%	19.9275%	13.5991%

		Lower	Upper	All
Prescriptions		145,178	2,044,267	106,275,524
Milligrams		212,396,243	2,704,338,180	159,104,474,703
Cash		$3,880,658	$30,977,929	$1,135,789,923
Cash/Prescription		$27	$15	$11

Table D.4b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2010 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	25	466
BUPRENORPHINE	1,316	4,992,970	18,085	57,246,779	3,150,325	8,378,676,349
BUTORPHANOL_TARTRATE	551	118,730	6,624	1,612,438	227,844	72,790,883
CODEINE	3,142	1,084,320	51,362	18,061,976	2,888,518	1,110,408,814
DIHYDROCODONE	10	4,905	290	99,184	17,521	7,500,629
FENTANYL	8,438	941,983	115,755	12,179,258	4,261,335	513,306,299
HYDROCODONE	46,509	28,994,319	673,300	395,693,633	42,612,704	29,265,477,576
HYDROMORPHONE	4,029	5,927,319	54,857	77,729,009	1,598,414	3,037,798,606
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	7	13,386	9	17,450	878	3,278,547
MEPERIDINE	155	61,863	5,461	1,601,430	240,759	79,329,691
METHADONE_HCL	3,077	10,920,619	47,060	185,285,599	2,988,194	14,389,758,679
MORPHINE	8,430	22,634,023	126,490	325,687,049	5,973,067	18,983,125,442
OXYCODONE	50,072	121,189,589	653,990	1,380,648,597	26,976,414	69,624,758,790
OXYMORPHONE_HCL	1,202	4,602,756	18,055	73,909,408	804,383	3,597,145,522
PENTAZOCINE	110	71,748	1,282	1,374,758	84,344	118,044,594
PROPOXYPHENE	2,702	2,553,953	54,370	51,099,430	3,788,187	3,912,838,766
REMIFENTANIL_HCL	0	0	0	0	8	62
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	266	734,242	6,805	14,829,086	277,645	652,811,496
TRAMADOL_HCL	15,161	7,549,519	210,473	107,263,097	10,384,962	5,357,423,492
Sum	145,178	212,396,243	2,044,267	2,704,338,180	106,275,524	159,104,474,702
Checksum	145,178	212,396,243	2,044,267	2,704,338,180	106,275,524	159,104,474,703

Table D.5a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2011 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0504%	0.7507%	41.7429%
Milligrams		0.0483%	0.6477%	41.0873%
Cash		0.1046%	0.8749%	37.7284%
Cash/Total | Contingency		28.4911%	17.9271%	13.0542%

		Lower	Upper	All
Prescriptions		129,777	1,934,556	107,576,092
Milligrams		189,054,447	2,536,787,004	160,927,936,628
Cash		$2,999,619	$25,100,328	$1,082,402,525
Cash/Prescription		$23	$13	$10

Table D.5b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2011 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	32	568
BUPRENORPHINE	1,052	2,172,675	23,225	55,827,710	4,061,618	9,877,081,476
BUTORPHANOL_TARTRATE	660	161,738	5,872	1,544,373	205,757	61,862,534
CODEINE	2,829	1,131,967	50,165	17,862,635	2,943,762	1,121,545,588
DIHYDROCODONE	41	16,084	418	170,761	23,438	8,564,629
FENTANYL	7,155	658,270	112,713	11,571,753	4,325,519	512,915,172
HYDROCODONE	40,987	26,038,706	639,117	382,531,239	43,463,222	30,189,838,596
HYDROMORPHONE	4,130	7,555,835	57,078	85,180,087	1,844,440	3,584,160,056
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	0	0	263	1,202,923
MEPERIDINE	116	24,870	5,589	1,436,505	205,313	69,670,856
METHADONE_HCL	2,335	8,649,561	43,480	163,519,483	2,998,615	14,089,533,528
MORPHINE	8,894	23,248,481	131,007	335,769,817	6,443,179	20,048,660,229
OXYCODONE	44,534	102,633,816	608,592	1,226,624,162	27,432,189	68,170,158,205
OXYMORPHONE_HCL	1,650	8,006,820	26,472	120,395,229	1,206,119	5,949,280,445
PENTAZOCINE	83	103,222	1,377	1,614,202	101,325	134,556,372
PROPOXYPHENE	0	0	14	19,220	2,202	4,817,200
REMIFENTANIL_HCL	0	0	0	0	1	10
SUFENTANIL_CITRATE	0	0	0	0	1	1
TAPENTADOL_HCL	558	1,356,771	10,186	23,381,628	469,825	1,114,517,141
TRAMADOL_HCL	14,754	7,295,632	219,251	109,338,199	11,849,274	5,989,571,099
Sum	129,777	189,054,447	1,934,556	2,536,787,004	107,576,092	160,927,936,628
Checksum	129,777	189,054,447	1,934,556	2,536,787,004	107,576,092	160,927,936,628

Table D.6a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2012 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0456%	0.7467%	42.5490%
Milligrams		0.0390%	0.6095%	41.0646%
Cash		0.1113%	0.7592%	38.0944%
Cash/Total | Contingency		28.4162%	14.3243%	11.9437%

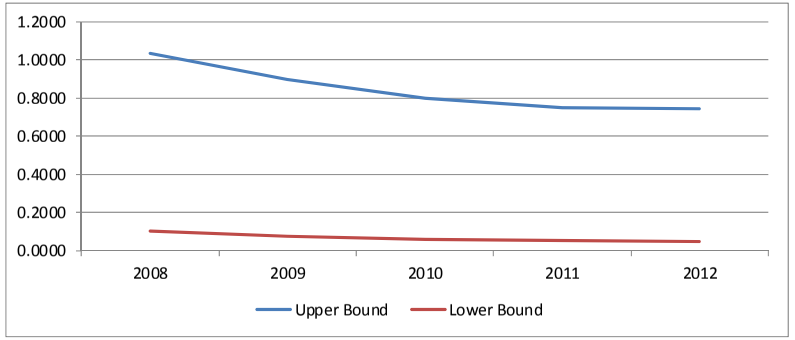
		Lower	Upper	All
Prescriptions		118,636	1,943,968	110,775,355
Milligrams		152,097,572	2,378,884,616	160,279,072,353
Cash		$2,876,793	$19,623,109	$984,586,131
Cash/Prescription		$24	$10	$9

Table D.6b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, 2012 (Prescriptions, Milligrams X Drug)

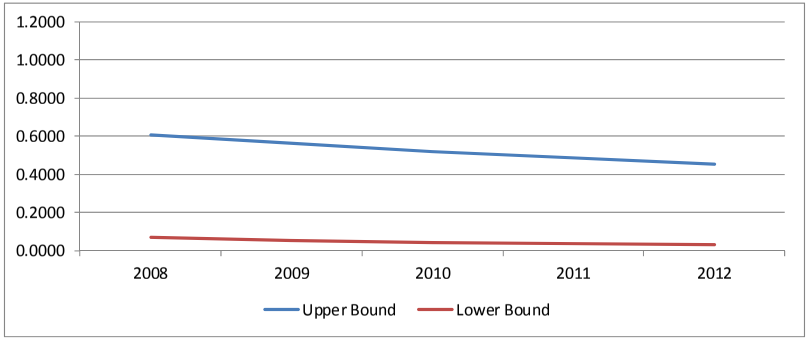
	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	31	1,218
BUPRENORPHINE	2,458	2,511,951	30,546	51,775,382	5,097,893	11,689,595,618
BUTORPHANOL_TARTRATE	809	182,737	6,504	1,775,006	188,365	55,557,959
CODEINE	2,293	834,839	47,308	15,276,495	2,692,091	1,010,418,381
DIHYDROCODONE	14	2,593	191	51,868	15,884	6,165,364
FENTANYL	7,656	802,282	120,086	12,031,743	4,405,998	507,574,933
HYDROCODONE	36,454	25,305,205	629,094	382,254,350	43,805,525	30,640,541,468
HYDROMORPHONE	4,382	7,743,905	65,201	93,743,636	2,109,713	4,204,704,764
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	13	24,268	1,643	6,050,176
MEPERIDINE	125	26,106	2,965	809,406	170,679	55,277,699
METHADONE_HCL	2,383	9,121,002	43,546	155,888,931	2,907,061	12,947,387,557
MORPHINE	7,431	16,211,485	136,685	336,295,370	6,960,959	20,797,854,236
OXYCODONE	37,311	71,453,213	583,854	1,076,503,584	27,682,971	65,811,607,089
OXYMORPHONE_HCL	1,960	8,964,985	22,335	102,315,813	940,169	4,374,925,841
PENTAZOCINE	36	16,028	945	868,595	88,464	114,798,443
PROPOXYPHENE	0	0	0	0	24	23,186
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	653	1,928,247	13,747	33,635,949	614,231	1,606,555,594
TRAMADOL_HCL	14,668	6,992,994	240,948	115,634,221	13,093,653	6,450,032,827
Sum	118,636	152,097,572	1,943,968	2,378,884,616	110,775,355	160,279,072,352
Checksum	118,636	152,097,572	1,943,968	2,378,884,616	110,775,355	160,279,072,353

Table D.7 Five-Year Stability Sample, Zip-Three Attribution, Unduplicated Trend

	Upper Bound Prescriptions (%)	Lower Bound Prescriptions (%)	Upper Bound Prescriptions (n)	Lower Bound Prescriptions (n)
2008	1.0343	0.1014	2,489,616	244,095
2009	0.8984	0.0728	2,226,457	180,379
2010	0.7983	0.0567	2,044,267	145,178
2011	0.7507	0.0504	1,934,556	129,777
2012	0.7467	0.0456	1,943,968	118,636



	Upper Bound Milligrams (%)	Lower Bound Milligrams (%)	Upper Bound Milligrams (n)	Lower Bound Milligrams (n)
2008	0.6096	0.0676	3,191,067,173	354,085,819
2009	0.5641	0.0526	2,952,533,764	275,281,645
2010	0.5167	0.0406	2,704,338,180	212,396,243
2011	0.4846	0.0361	2,536,787,004	189,054,447
2012	0.4545	0.0291	2,378,884,616	152,097,572



Appendix E

Five-Year Stability Sample, State Attribution, Duplicated, Projected: 2008-2012

Table E.1a Five-Year Stability Sample, State Attribution, Duplicated, Projected, 2008 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	33.9903%	3.7200%	0.2554%	0.0298%	0.0047%	0.0012%
Milligrams		56.0190%	7.2007%	0.6742%	0.0952%	0.0177%	0.0056%
Cash		52.3412%	13.3803%	2.4191%	0.4059%	0.2365%	0.1917%
Cash/Total | Contingency		6.0951%	11.9503%	22.6538%	34.7314%	72.0078%	91.7619%
Prescriptions	2	10.5514%	4.4191%	0.3650%	0.0366%	0.0059%	0.0060%
Milligrams		13.0242%	5.9423%	0.6800%	0.0865%	0.0195%	0.0264%
Cash		9.5391%	16.4994%	2.4535%	0.4181%	0.1562%	0.1553%
Cash/Total | Contingency		4.6704%	19.8033%	24.2543%	37.9604%	61.1243%	54.0159%
Prescriptions	3	0.6432%	0.4730%	0.3010%	0.0420%	0.0046%	0.0013%
Milligrams		0.8391%	0.7082%	0.4777%	0.0816%	0.0134%	0.0043%
Cash		0.6937%	1.8728%	2.4281%	0.4254%	0.0524%	0.0081%
Cash/Total | Contingency		4.7207%	17.8169%	38.4683%	37.3120%	35.7094%	7.0940%
Prescriptions	4	0.0338%	0.0335%	0.0306%	0.0324%	0.0095%	0.0033%
Milligrams		0.0485%	0.0531%	0.0620%	0.0499%	0.0172%	0.0051%
Cash		0.0481%	0.0776%	0.3113%	0.3300%	0.1485%	0.0456%
Cash/Total | Contingency		5.9204%	10.9060%	35.3641%	43.6656%	49.7923%	11.3003%
Prescriptions	5	0.0030%	0.0032%	0.0022%	0.0047%	0.0049%	0.0025%
Milligrams		0.0083%	0.0062%	0.0040%	0.0092%	0.0093%	0.0101%
Cash		0.0037%	0.0104%	0.0051%	0.1906%	0.0574%	0.4164%
Cash/Total | Contingency		2.6071%	12.0831%	7.5325%	73.0530%	30.2400%	87.8781%
Prescriptions	6	0.0005%	0.0001%	0.0006%	0.0004%	0.0010%	0.0014%
Milligrams		0.0023%	0.0001%	0.0015%	0.0011%	0.0008%	0.0016%
Cash		0.0039%	0.0000%	0.0027%	0.0139%	0.0295%	0.0598%
Cash/Total | Contingency		31.0753%	0.0000%	12.1854%	69.2475%	50.7078%	75.5845%

Table E.1b Five-Year Stability Sample, State Attribution, Duplicated, Projected, 2008 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	83,374,393	9,124,828	626,571	72,987	11,639	2,921
Milligrams		124,439,270,834	15,995,512,040	1,497,561,930	211,453,694	39,335,528	12,405,640
Cash		$428,235,950	$109,472,362	$19,792,409	$3,321,082	$1,934,841	$1,568,306
Cash/Prescription		$5	$12	$32	$46	$166	$537
Prescriptions	2	25,881,380	10,839,629	895,266	89,721	14,546	14,750
Milligrams		28,931,740,877	13,200,071,346	1,510,438,034	192,218,393	43,328,917	58,550,901
Cash		$78,045,615	$134,991,781	$20,073,376	$3,420,517	$1,277,645	$1,270,963
Cash/Prescription		$3	$12	$22	$38	$88	$86
Prescriptions	3	1,577,760	1,160,134	738,424	103,101	11,336	3,275
Milligrams		1,863,894,558	1,573,127,595	1,061,054,956	181,211,348	29,680,882	9,606,782
Cash		$5,675,579	$15,322,609	$19,866,160	$3,480,450	$428,441	$65,916
Cash/Prescription		$4	$13	$27	$34	$38	$20
Prescriptions	4	82,952	82,189	75,105	79,591	23,425	8,198
Milligrams		107,761,516	117,990,531	137,741,382	110,910,116	38,223,710	11,372,009
Cash		$393,910	$635,040	$2,546,681	$2,700,122	$1,215,179	$373,427
Cash/Prescription		$5	$8	$34	$34	$52	$46
Prescriptions	5	7,276	7,749	5,366	11,600	11,979	6,015
Milligrams		18,455,748	13,822,101	8,961,525	20,520,662	20,658,981	22,458,365
Cash		$29,879	$85,133	$41,502	$1,559,363	$469,587	$3,406,735
Cash/Prescription		$4	$11	$8	$134	$39	$566
Prescriptions	6	1,129	186	1,589	955	2,530	3,512
Milligrams		5,050,617	228,434	3,422,831	2,543,323	1,751,648	3,453,952
Cash		$31,735	$0	$22,397	$114,040	$241,592	$489,366
Cash/Prescription		$28	$0	$14	$119	$95	$139

Table E.2a Five-Year Stability Sample, State Attribution, Duplicated, Projected, 2009 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	34.5188%	3.6075%	0.2290%	0.0259%	0.0033%	0.0004%
Milligrams		56.4805%	7.3459%	0.6148%	0.0813%	0.0164%	0.0027%
Cash		53.1370%	11.1355%	1.6066%	0.3101%	0.1669%	0.0252%
Cash/Total | Contingency		6.1818%	9.6168%	15.9788%	24.6552%	61.4942%	60.6476%
Prescriptions	2	10.4130%	3.9389%	0.2981%	0.0257%	0.0048%	0.0040%
Milligrams		12.6719%	5.2734%	0.5917%	0.0564%	0.0129%	0.0100%
Cash		9.8988%	13.0826%	1.9152%	0.2126%	0.0785%	0.0246%
Cash/Total | Contingency		5.0639%	16.9475%	19.7657%	23.8417%	55.0746%	21.1816%
Prescriptions	3	0.6015%	0.4080%	0.1997%	0.0241%	0.0024%	0.0008%
Milligrams		0.7653%	0.5859%	0.3157%	0.0463%	0.0048%	0.0025%
Cash		0.6958%	1.4944%	1.4704%	0.2413%	0.0295%	0.0043%
Cash/Total | Contingency		5.2992%	16.1124%	31.2509%	31.7784%	34.0327%	10.2145%
Prescriptions	4	0.0281%	0.0275%	0.0200%	0.0152%	0.0043%	0.0014%
Milligrams		0.0396%	0.0417%	0.0355%	0.0237%	0.0066%	0.0055%
Cash		0.0464%	0.0651%	0.1531%	0.1491%	0.0563%	0.0388%
Cash/Total | Contingency		5.9573%	10.1211%	27.4935%	36.4721%	46.9482%	59.2398%
Prescriptions	5	0.0023%	0.0017%	0.0014%	0.0022%	0.0022%	0.0009%
Milligrams		0.0070%	0.0028%	0.0016%	0.0052%	0.0041%	0.0032%
Cash		0.0045%	0.0041%	0.0020%	0.1157%	0.0238%	0.0936%
Cash/Total | Contingency		2.3922%	8.3349%	7.2320%	64.0079%	36.5874%	88.9222%
Prescriptions	6	0.0011%	0.0000%	0.0003%	0.0002%	0.0003%	0.0005%
Milligrams		0.0063%	0.0001%	0.0005%	0.0007%	0.0002%	0.0008%
Cash		0.0024%	0.0000%	0.0007%	0.0067%	0.0045%	0.0338%
Cash/Total | Contingency		9.8030%	0.0000%	8.2202%	57.9111%	50.7509%	81.1319%

Table E.2b Five-Year Stability Sample, State Attribution, Duplicated, Projected, 2009 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	87,202,880	9,113,478	578,608	65,406	8,373	996
Milligrams		135,482,538,806	17,620,882,506	1,474,807,041	194,968,385	39,229,942	6,389,129
Cash		$453,126,471	$94,958,094	$13,700,014	$2,644,112	$1,422,979	$215,082
Cash/Prescription		$5	$10	$24	$40	$170	$216
Prescriptions	2	26,305,682	9,950,751	753,106	64,985	12,236	9,988
Milligrams		30,396,623,180	12,649,665,853	1,419,384,237	135,234,504	30,951,602	23,892,072
Cash		$84,412,148	$111,561,636	$16,332,188	$1,812,875	$669,523	$209,995
Cash/Prescription		$3	$11	$22	$28	$55	$21
Prescriptions	3	1,519,539	1,030,770	504,525	60,816	6,150	2,077
Milligrams		1,835,813,590	1,405,395,536	757,246,152	111,062,839	11,558,800	5,880,330
Cash		$5,933,668	$12,743,276	$12,538,814	$2,058,057	$251,733	$36,619
Cash/Prescription		$4	$12	$25	$34	$41	$18
Prescriptions	4	71,047	69,372	50,496	38,287	10,791	3,624
Milligrams		95,084,327	100,052,236	85,106,589	56,797,582	15,747,268	13,188,134
Cash		$395,352	$555,456	$1,305,573	$1,271,462	$480,139	$330,475
Cash/Prescription		$6	$8	$26	$33	$44	$91
Prescriptions	5	5,828	4,270	3,516	5,684	5,586	2,313
Milligrams		16,712,966	6,772,330	3,834,882	12,463,152	9,810,619	7,725,803
Cash		$37,968	$34,957	$16,681	$986,939	$202,958	$798,069
Cash/Prescription		$7	$8	$5	$174	$36	$345
Prescriptions	6	2,774	112	821	440	653	1,279
Milligrams		15,212,059	159,128	1,149,984	1,757,752	512,982	1,991,344
Cash		$20,164	$0	$5,592	$56,712	$38,166	$288,348
Cash/Prescription		$7	$0	$7	$129	$58	$225

Table E.3a Five-Year Stability Sample, State Attribution, Duplicated, Projected, 2010 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	34.5849%	3.3380%	0.1797%	0.0163%	0.0021%	0.0004%
Milligrams		57.1723%	6.6935%	0.4819%	0.0473%	0.0122%	0.0080%
Cash		54.3153%	8.7082%	1.0868%	0.1955%	0.1382%	0.1982%
Cash/Total | Contingency		7.6186%	9.9550%	16.9319%	33.7684%	74.2650%	96.1389%
Prescriptions	2	10.1766%	3.4164%	0.2323%	0.0201%	0.0031%	0.0020%
Milligrams		12.1761%	4.5149%	0.4377%	0.0510%	0.0116%	0.0128%
Cash		9.0501%	11.5122%	1.5152%	0.2190%	0.1215%	0.0865%
Cash/Total | Contingency		6.0136%	20.5867%	25.5412%	36.9958%	80.5621%	55.5042%
Prescriptions	3	0.5610%	0.3393%	0.1474%	0.0161%	0.0013%	0.0002%
Milligrams		0.6864%	0.4615%	0.2305%	0.0262%	0.0027%	0.0001%
Cash		0.5860%	1.3508%	1.2103%	0.1284%	0.0087%	0.0002%
Cash/Total | Contingency		6.4810%	21.4588%	40.7551%	31.5736%	23.8589%	11.3754%
Prescriptions	4	0.0251%	0.0216%	0.0140%	0.0104%	0.0023%	0.0002%
Milligrams		0.0357%	0.0301%	0.0222%	0.0132%	0.0029%	0.0001%
Cash		0.0299%	0.0562%	0.1218%	0.0753%	0.0256%	0.0013%
Cash/Total | Contingency		5.8663%	14.3530%	40.3603%	35.8226%	40.5084%	80.8154%
Prescriptions	5	0.0018%	0.0011%	0.0010%	0.0015%	0.0015%	0.0001%
Milligrams		0.0064%	0.0018%	0.0015%	0.0018%	0.0022%	0.0007%
Cash		0.0012%	0.0030%	0.0029%	0.0228%	0.0085%	0.0217%
Cash/Total | Contingency		1.3805%	7.6072%	19.2781%	55.6339%	12.4325%	49.9745%
Prescriptions	6	0.0006%	0.0000%	0.0001%	0.0000%	0.0002%	0.0002%
Milligrams		0.0072%	0.0000%	0.0000%	0.0001%	0.0002%	0.0003%
Cash		0.0288%	0.0000%	0.0002%	0.0001%	0.0033%	0.0092%
Cash/Total | Contingency		62.9137%	0.0000%	21.2859%	9.0352%	38.1235%	39.2907%

Table E.3b Five-Year Stability Sample, State Attribution, Duplicated, Projected, 2010 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	90,290,286	8,714,507	469,250	42,598	5,508	1,011
Milligrams		147,437,055,757	17,261,244,855	1,242,755,378	121,945,988	31,437,857	20,573,744
Cash		$581,295,092	$93,196,980	$11,631,148	$2,092,075	$1,478,677	$2,121,095
Cash/Prescription		$6	$11	$25	$49	$268	$2,097
Prescriptions	2	26,567,882	8,919,147	606,546	52,440	8,045	5,189
Milligrams		31,399,983,662	11,642,976,157	1,128,642,609	131,584,959	30,009,444	33,073,933
Cash		$96,856,697	$123,205,936	$16,215,859	$2,344,045	$1,299,832	$925,976
Cash/Prescription		$4	$14	$27	$45	$162	$178
Prescriptions	3	1,464,513	885,681	384,755	42,096	3,294	509
Milligrams		1,770,222,556	1,190,092,995	594,361,989	67,639,934	6,865,602	194,972
Cash		$6,271,112	$14,456,151	$12,952,919	$1,374,216	$92,603	$2,146
Cash/Prescription		$4	$16	$34	$33	$28	$4
Prescriptions	4	65,619	56,471	36,623	27,244	6,006	484
Milligrams		92,173,382	77,562,642	57,274,093	34,125,423	7,384,197	284,484
Cash		$320,497	$601,465	$1,303,895	$805,764	$274,243	$14,345
Cash/Prescription		$5	$11	$36	$30	$46	$30
Prescriptions	5	4,622	2,946	2,570	3,842	4,019	372
Milligrams		16,613,852	4,727,156	3,746,675	4,524,638	5,644,812	1,677,032
Cash		$13,075	$32,295	$31,101	$243,702	$90,948	$232,635
Cash/Prescription		$3	$11	$12	$63	$23	$625
Prescriptions	6	1,580	13	171	97	623	422
Milligrams		18,442,343	22,246	98,604	339,099	423,559	663,499
Cash		$308,641	$0	$2,469	$585	$35,200	$98,658
Cash/Prescription		$195	$0	$14	$6	$56	$234

Table E.4a Five-Year Stability Sample, State Attribution, Duplicated, Projected, 2011 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	34.9385%	3.3958%	0.1804%	0.0130%	0.0013%	0.0006%
Milligrams		57.6107%	6.9350%	0.4974%	0.0394%	0.0021%	0.0016%
Cash		54.4431%	8.0869%	0.8420%	0.0962%	0.0237%	0.0257%
Cash/Total | Contingency		7.3770%	9.2812%	13.0012%	17.5719%	55.2493%	67.3308%
Prescriptions	2	10.1546%	3.2107%	0.2065%	0.0160%	0.0027%	0.0017%
Milligrams		12.1182%	4.1112%	0.3891%	0.0438%	0.0072%	0.0023%
Cash		9.0723%	10.2399%	1.1261%	0.2464%	0.1336%	0.0103%
Cash/Total | Contingency		5.8164%	19.7900%	21.7821%	46.3747%	88.2929%	38.2879%
Prescriptions	3	0.5402%	0.3105%	0.1314%	0.0133%	0.0012%	0.0001%
Milligrams		0.6593%	0.4121%	0.1937%	0.0244%	0.0024%	0.0000%
Cash		0.5201%	1.0707%	1.0003%	0.1350%	0.0125%	0.0001%
Cash/Total | Contingency		5.7254%	19.1597%	37.6306%	44.2097%	36.8121%	7.2208%
Prescriptions	4	0.0223%	0.0197%	0.0123%	0.0097%	0.0026%	0.0003%
Milligrams		0.0319%	0.0246%	0.0188%	0.0133%	0.0036%	0.0006%
Cash		0.0244%	0.0360%	0.0788%	0.0739%	0.0212%	0.0056%
Cash/Total | Contingency		5.6533%	12.4500%	34.0512%	44.4128%	44.0700%	21.4767%
Prescriptions	5	0.0011%	0.0009%	0.0006%	0.0015%	0.0013%	0.0006%
Milligrams		0.0040%	0.0009%	0.0006%	0.0027%	0.0029%	0.0029%
Cash		0.0014%	0.0014%	0.0008%	0.0421%	0.0060%	0.0561%
Cash/Total | Contingency		3.1853%	13.6247%	12.6569%	75.1370%	15.0614%	66.7294%
Prescriptions	6	0.0002%	.	0.0000%	0.0001%	0.0003%	0.0002%
Milligrams		0.0007%	.	0.0000%	0.0002%	0.0001%	0.0001%
Cash		0.0020%	.	0.0001%	0.0011%	0.0014%	0.0024%
Cash/Total | Contingency		50.5614%	.	57.4280%	64.1277%	25.5025%	35.5044%

Table E.4b Five-Year Stability Sample, State Attribution, Duplicated, Projected, 2011 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	91,815,914	8,923,933	474,008	34,099	3,538	1,624
Milligrams		149,363,092,050	17,979,879,852	1,289,485,586	102,106,758	5,540,148	4,207,569
Cash		$559,214,250	$83,064,543	$8,648,471	$987,698	$243,016	$264,344
Cash/Prescription		$6	$9	$18	$29	$69	$163
Prescriptions	2	26,685,557	8,437,377	542,762	42,073	7,214	4,499
Milligrams		31,418,016,149	10,658,722,956	1,008,814,986	113,503,439	18,707,464	6,090,514
Cash		$93,186,339	$105,179,722	$11,567,198	$2,531,249	$1,372,142	$105,909
Cash/Prescription		$3	$12	$21	$60	$190	$24
Prescriptions	3	1,419,541	816,036	345,256	34,856	3,127	201
Milligrams		1,709,211,798	1,068,370,603	502,181,150	63,333,005	6,236,568	66,123
Cash		$5,341,937	$10,997,422	$10,274,302	$1,386,990	$128,660	$586
Cash/Prescription		$4	$13	$30	$40	$41	$3
Prescriptions	4	58,567	51,650	32,214	25,495	6,715	810
Milligrams		82,768,602	63,783,520	48,848,544	34,580,736	9,328,992	1,470,638
Cash		$250,366	$369,672	$809,115	$758,902	$217,652	$57,407
Cash/Prescription		$4	$7	$25	$30	$32	$71
Prescriptions	5	3,020	2,274	1,605	3,870	3,513	1,559
Milligrams		10,434,737	2,365,349	1,631,490	6,955,084	7,524,260	7,625,266
Cash		$14,165	$14,687	$7,706	$432,470	$61,953	$575,829
Cash/Prescription		$5	$6	$5	$112	$18	$369
Prescriptions	6	575	.	119	191	676	475
Milligrams		1,818,467	.	126,816	491,191	353,969	296,467
Cash		$21,057	.	$1,427	$11,498	$14,094	$25,014
Cash/Prescription		$37	.	$12	$60	$21	$53

Table E.5a Base Year Sample, State Attribution, Duplicated, Projected, 2012 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	35.6299%	3.4808%	0.1678%	0.0088%	0.0009%	0.0001%
Milligrams		57.4543%	7.2671%	0.4861%	0.0285%	0.0025%	0.0004%
Cash		56.1081%	6.7304%	0.5224%	0.0506%	0.0098%	0.0023%
Cash/Total | Contingency		6.8246%	6.5808%	7.1465%	11.8680%	31.9071%	40.6688%
Prescriptions	2	10.5696%	2.9625%	0.1732%	0.0105%	0.0009%	0.0002%
Milligrams		12.3341%	3.6239%	0.3146%	0.0222%	0.0020%	0.0006%
Cash		9.7258%	5.9662%	0.6268%	0.0600%	0.0087%	0.0044%
Cash/Total | Contingency		5.5213%	11.7571%	13.4774%	17.4453%	31.8414%	71.1948%
Prescriptions	3	0.5629%	0.2934%	0.0990%	0.0095%	0.0009%	0.0002%
Milligrams		0.6558%	0.3569%	0.1237%	0.0149%	0.0017%	0.0003%
Cash		0.7040%	0.6469%	0.4496%	0.0590%	0.0087%	0.0017%
Cash/Total | Contingency		6.6738%	12.1341%	25.4383%	27.4920%	34.7532%	40.0214%
Prescriptions	4	0.0222%	0.0180%	0.0108%	0.0061%	0.0012%	0.0002%
Milligrams		0.0285%	0.0235%	0.0132%	0.0075%	0.0018%	0.0003%
Cash		0.0379%	0.0724%	0.0474%	0.0459%	0.0086%	0.0043%
Cash/Total | Contingency		7.7119%	19.3462%	24.3492%	32.7986%	29.7655%	51.4998%
Prescriptions	5	0.0009%	0.0008%	0.0009%	0.0009%	0.0009%	0.0003%
Milligrams		0.0026%	0.0013%	0.0010%	0.0009%	0.0012%	0.0004%
Cash		0.0027%	0.0033%	0.0019%	0.0072%	0.0079%	0.0024%
Cash/Total | Contingency		8.8174%	16.2750%	17.9575%	38.8045%	29.2235%	31.0807%
Prescriptions	6	0.0001%	0.0000%	0.0001%	0.0001%	0.0002%	0.0002%
Milligrams		0.0008%	0.0000%	0.0001%	0.0001%	0.0002%	0.0002%
Cash		0.0006%	0.0000%	0.0001%	0.0006%	0.0017%	0.0024%
Cash/Total | Contingency		18.5197%	0.0000%	25.0238%	51.2582%	35.7184%	42.5517%

Table E.5b Base Year Sample, State Attribution, Duplicated, Projected, 2012 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	94,648,643	9,246,668	445,688	23,309	2,268	338
Milligrams		149,019,746,812	18,848,832,237	1,260,893,533	73,894,403	6,538,954	991,172
Cash		$516,980,359	$62,014,227	$4,813,432	$466,086	$90,462	$21,430
Cash/Prescription		$5	$7	$11	$20	$40	$63
Prescriptions	2	28,077,485	7,869,702	460,096	27,953	2,312	614
Milligrams		31,991,039,307	9,399,384,448	815,991,206	57,696,969	5,074,714	1,506,547
Cash		$89,613,180	$54,972,477	$5,775,513	$552,576	$80,162	$40,870
Cash/Prescription		$3	$7	$13	$20	$35	$67
Prescriptions	3	1,495,298	779,361	263,110	25,282	2,310	484
Milligrams		1,701,015,918	925,646,149	320,947,904	38,758,219	4,491,582	712,025
Cash		$6,486,331	$5,960,276	$4,142,218	$544,023	$80,017	$15,829
Cash/Prescription		$4	$8	$16	$22	$35	$33
Prescriptions	4	58,960	47,778	28,619	16,311	3,117	545
Milligrams		73,864,381	60,977,611	34,335,763	19,467,073	4,712,487	811,365
Cash		$349,037	$667,158	$437,103	$422,516	$78,864	$39,844
Cash/Prescription		$6	$14	$15	$26	$25	$73
Prescriptions	5	2,493	2,232	2,323	2,344	2,305	767
Milligrams		6,819,231	3,400,855	2,543,575	2,320,577	3,157,166	1,109,400
Cash		$24,717	$30,804	$17,511	$66,739	$72,488	$22,168
Cash/Prescription		$10	$14	$8	$28	$31	$29
Prescriptions	6	335	56	223	331	605	640
Milligrams		2,093,366	32,998	146,958	254,162	394,862	478,457
Cash		$5,576	$0	$962	$5,878	$15,791	$22,516
Cash/Prescription		$17	$0	$4	$18	$26	$35

Appendix F

Five-Year Stability Sample, State Attribution, Unduplicated, Projected: 2008-2012

Table F.1a Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2008 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.1927%	1.7512%	47.4147%
Milligrams		0.3825%	2.9492%	72.0715%
Cash		1.3608%	6.7825%	73.7609%
Cash/Total | Contingency		26.8613%	14.7087%	6.7344%

		Lower	Upper	All
Prescriptions		472,782	4,295,445	116,302,692
Milligrams		849,599,352	6,551,225,405	160,097,939,391
Cash		$11,133,872	$55,491,958	$603,484,507
Cash/Prescription		$24	$13	$5

Table F.1b Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2008 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	.	.
BUPRENORPHINE	3,437	11,963,043	37,777	136,546,712	2,175,964	5,983,112,317
BUTORPHANOL_TARTRATE	1,822	630,981	12,618	3,197,284	309,175	92,037,534
CODEINE	15,578	7,017,725	150,920	55,128,748	4,632,000	1,780,047,763
DIHYDROCODONE	14	6,672	1,361	539,363	37,358	15,716,221
FENTANYL	16,157	1,899,073	202,166	24,116,357	4,735,947	588,984,870
HYDROCODONE	184,966	126,723,666	1,628,150	999,619,953	50,633,980	32,898,487,681
HYDROMORPHONE	7,674	12,220,949	89,086	139,391,589	1,438,782	2,588,462,068
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	.	.	773	4,819,290	8,885	30,043,517
MEPERIDINE	2,391	977,302	22,157	5,384,326	521,850	148,032,370
METHADONE_HCL	8,712	47,249,695	101,143	516,821,843	3,084,037	15,472,573,708
MORPHINE	16,758	56,827,156	208,086	669,544,207	5,549,712	18,559,550,306
OXYCODONE	173,468	554,524,679	1,456,097	3,689,984,182	28,442,480	69,729,263,247
OXYMORPHONE_HCL	2,810	8,636,911	32,861	123,978,389	495,555	2,064,788,801
PENTAZOCINE	754	1,899,104	3,927	5,353,604	142,248	194,996,309
PROPOXYPHENE	.	.	.	.	4,056,626	4,824,691,581
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	.	.	.	.	.	.
TRAMADOL_HCL	38,243	19,022,397	348,324	176,799,556	10,038,095	5,127,151,097
Sum	472,782	849,599,352	4,295,445	6,551,225,405	116,302,692	160,097,939,391
Checksum	472,782	849,599,352	4,295,445	6,551,225,405	116,302,692	160,097,939,391

Table F.2a Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2009 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.1368%	1.5368%	47.5823%
Milligrams		0.2653%	2.5403%	72.0837%
Cash		0.8141%	5.2222%	73.0558%
Cash/Total | Contingency		19.3048%	12.8030%	6.6995%

		Lower	Upper	All
Prescriptions		345,561	3,882,450	120,204,525
Milligrams		636,360,172	6,093,491,236	172,910,712,386
Cash		$6,942,193	$44,532,696	$622,983,993
Cash/Prescription		$20	$11	$5

Table F.2b Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2009 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	1	12
BUPRENORPHINE	3,409	11,364,095	42,666	152,849,602	3,022,482	7,979,049,125
BUTORPHANOL_TARTRATE	1,553	530,542	11,819	3,083,220	287,577	87,996,931
CODEINE	9,747	3,740,688	128,434	47,588,516	4,243,639	1,640,125,942
DIHYDROCODONE	14	9,144	945	492,398	27,738	12,719,970
FENTANYL	14,878	1,763,394	179,987	21,402,481	4,590,209	572,731,438
HYDROCODONE	116,831	73,592,331	1,367,414	822,942,378	51,761,798	34,691,763,177
HYDROMORPHONE	8,497	14,391,009	94,306	155,273,229	1,646,017	3,005,976,569
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	.	.	71	345,741	8,613	33,873,009
MEPERIDINE	1,446	500,307	15,560	4,263,526	355,805	115,874,080
METHADONE_HCL	7,076	36,879,754	90,737	441,753,991	3,164,188	15,742,722,834
MORPHINE	16,154	54,502,571	210,154	663,758,459	6,097,813	20,209,777,446
OXYCODONE	130,652	411,416,302	1,348,690	3,399,261,695	29,769,473	75,428,294,813
OXYMORPHONE_HCL	3,412	10,483,663	45,687	190,089,689	724,755	3,132,601,965
PENTAZOCINE	239	497,182	2,562	3,087,330	107,455	148,178,760
PROPOXYPHENE	.	.	.	.	3,520,780	4,286,425,122
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	1	1
TAPENTADOL_HCL	224	417,880	4,552	10,721,440	86,492	190,275,671
TRAMADOL_HCL	31,429	16,271,310	338,864	176,577,540	10,789,688	5,632,325,519
Sum	345,561	636,360,172	3,882,450	6,093,491,236	120,204,525	172,910,712,385
Checksum	345,561	636,360,172	3,882,450	6,093,491,236	120,204,525	172,910,712,386

Table F.3a Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2010 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.1071%	1.3530%	47.1718%
Milligrams		0.1980%	2.1366%	72.0935%
Cash		0.5828%	4.2370%	72.4141%
Cash/Total | Contingency		22.7250%	15.3313%	8.1032%

		Lower	Upper	All
Prescriptions		279,637	3,532,179	123,150,802
Milligrams		510,609,476	5,509,900,609	185,915,932,198
Cash		$6,237,077	$45,345,038	$774,992,728
Cash/Prescription		$22	$13	$6

Table F.3b Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2010 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	25	575
BUPRENORPHINE	2,999	10,864,028	41,110	141,928,867	3,577,495	9,460,516,051
BUTORPHANOL_TARTRATE	560	189,632	8,682	2,089,519	266,702	81,847,177
CODEINE	7,617	2,561,608	108,401	38,990,695	3,844,676	1,507,127,310
DIHYDROCODONE	6	1,758	591	254,364	23,665	10,956,939
FENTANYL	11,787	1,296,930	157,516	17,789,743	4,570,499	563,821,241
HYDROCODONE	93,383	59,532,667	1,202,669	725,411,365	51,146,513	35,697,600,606
HYDROMORPHONE	7,428	13,467,704	90,065	145,052,861	1,786,794	3,348,165,418
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	.	.	29	112,082	1,677	6,656,415
MEPERIDINE	458	241,075	10,846	3,138,339	298,467	99,798,051
METHADONE_HCL	5,258	23,561,647	78,733	371,614,085	3,215,282	15,749,758,908
MORPHINE	13,499	47,127,269	195,293	580,681,901	6,574,065	21,626,952,374
OXYCODONE	104,902	319,579,843	1,250,494	3,073,500,460	32,273,176	83,190,702,324
OXYMORPHONE_HCL	4,996	16,543,256	50,266	206,079,299	931,117	4,169,663,873
PENTAZOCINE	397	511,132	2,101	2,575,845	97,074	139,709,670
PROPOXYPHENE	.	.	.	.	2,802,113	3,477,696,152
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	607	1,436,715	13,105	30,098,091	319,282	760,158,929
TRAMADOL_HCL	25,739	13,694,212	322,279	170,583,094	11,422,182	6,024,800,185
Sum	279,637	510,609,476	3,532,179	5,509,900,609	123,150,802	185,915,932,198
Checksum	279,637	510,609,476	3,532,179	5,509,900,609	123,150,802	185,915,932,198

Table F.4a Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2011 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0945%	1.2795%	47.4056%
Milligrams		0.1714%	2.0044%	72.3778%
Cash		0.4503%	3.5139%	71.9026%
Cash/Total | Contingency		21.6168%	13.2515%	7.7983%

		Lower	Upper	All
Prescriptions		248,451	3,362,412	124,578,675
Milligrams		444,249,460	5,196,533,648	187,648,492,913
Cash		$4,625,754	$36,093,139	$738,550,373
Cash/Prescription		$19	$11	$6

Table F.4b Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2011 (Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	32	698
BUPRENORPHINE	2,368	5,886,502	49,729	136,013,069	4,448,587	11,113,482,808
BUTORPHANOL_TARTRATE	756	280,813	8,170	2,175,629	242,807	72,402,426
CODEINE	6,864	2,689,463	101,718	36,312,650	3,874,905	1,515,691,793
DIHYDROCODONE	14	5,019	608	255,406	26,393	11,293,110
FENTANYL	10,456	1,003,070	153,189	16,868,366	4,590,164	559,030,302
HYDROCODONE	81,845	53,383,080	1,119,080	690,530,160	51,602,568	36,751,438,867
HYDROMORPHONE	7,060	14,440,697	93,042	161,147,439	2,040,532	3,934,705,944
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	.	.	0	0	380	1,628,763
MEPERIDINE	291	77,016	8,682	2,618,802	249,501	86,980,092
METHADONE_HCL	4,651	20,785,818	73,022	328,690,322	3,202,265	15,374,931,054
MORPHINE	13,002	46,902,166	196,453	588,151,061	6,990,824	22,655,817,262
OXYCODONE	88,123	258,266,981	1,132,959	2,680,372,391	32,415,437	80,684,006,287
OXYMORPHONE_HCL	6,071	24,225,387	71,578	328,179,551	1,374,916	6,711,075,324
PENTAZOCINE	195	433,835	2,328	3,146,488	113,848	157,781,050
PROPOXYPHENE	.	.	.	.	2,320	6,315,847
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	2	2
TAPENTADOL_HCL	1,072	2,311,724	20,088	48,846,322	535,722	1,302,201,155
TRAMADOL_HCL	25,683	13,557,888	331,767	173,225,993	12,867,472	6,709,710,132
Sum	248,451	444,249,460	3,362,412	5,196,533,648	124,578,675	187,648,492,913
Checksum	248,451	444,249,460	3,362,412	5,196,533,648	124,578,675	187,648,492,913

Table F.5a Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2012 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0834%	1.2685%	48.3508%
Milligrams		0.1343%	1.8781%	72.2978%
Cash		0.3651%	2.8757%	72.2960%
Cash/Total | Contingency		17.2676%	10.0123%	7.0352%

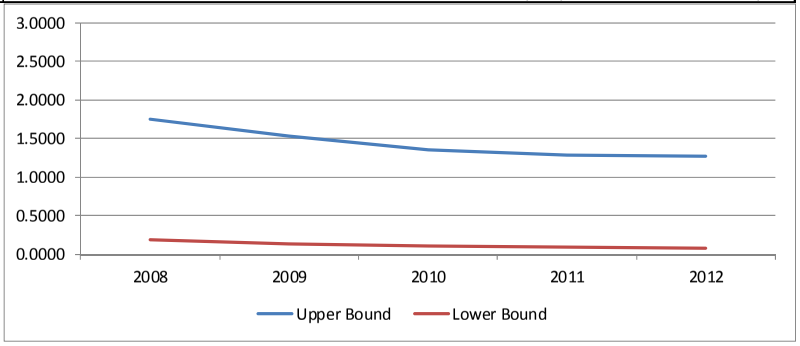
		Lower	Upper	All
Prescriptions		221,665	3,369,660	128,441,156
Milligrams		348,246,842	4,871,138,710	187,519,579,271
Cash		$3,364,138	$26,497,104	$666,136,384
Cash/Prescription		$15	$8	$5

Table F.5b Five-Year Stability Sample, State Attribution, Unduplicated, Projected, 2012 (Prescriptions, Milligrams X Drug)

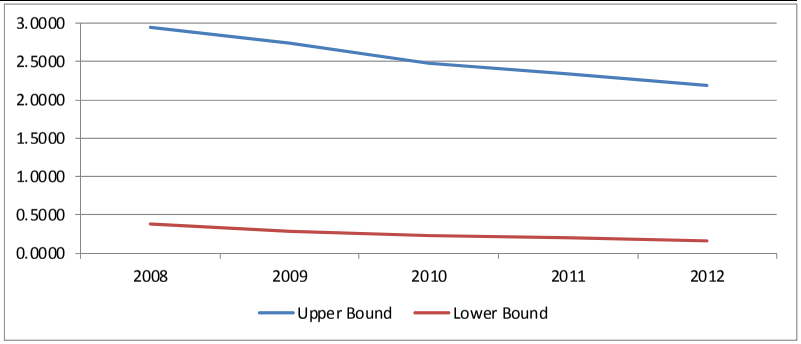
	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	39	1,657
BUPRENORPHINE	3,370	7,111,462	61,634	126,561,457	5,570,225	13,262,936,250
BUTORPHANOL_TARTRATE	1,027	338,941	8,848	2,511,525	227,428	68,166,282
CODEINE	5,755	2,106,588	96,409	31,953,082	3,565,265	1,376,685,426
DIHYDROCODONE	6	1,331	403	136,916	20,193	8,617,514
FENTANYL	10,724	1,163,408	161,335	17,493,051	4,677,052	555,750,612
HYDROCODONE	68,514	45,708,912	1,101,927	692,172,474	52,258,003	37,426,271,044
HYDROMORPHONE	7,405	13,210,278	102,285	165,620,332	2,343,852	4,614,642,144
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	45	182,729	2,960	10,979,696
MEPERIDINE	340	91,672	5,665	1,626,437	210,335	71,006,781
METHADONE_HCL	4,237	19,202,837	72,307	307,996,007	3,123,052	14,239,030,643
MORPHINE	12,667	36,971,740	210,987	597,962,265	7,568,627	23,497,688,887
OXYCODONE	76,127	183,998,065	1,096,993	2,409,421,705	32,745,973	78,148,938,758
OXYMORPHONE_HCL	4,302	21,642,261	56,273	264,614,106	1,075,432	5,007,469,152
PENTAZOCINE	111	112,959	1,836	2,091,962	99,503	135,914,463
PROPOXYPHENE	0	0	2	1,890	30	33,879
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	0	0	0	0	1	8
TAPENTADOL_HCL	1,390	3,656,277	26,248	67,156,451	698,135	1,863,751,047
TRAMADOL_HCL	25,691	12,930,112	366,466	183,636,320	14,255,051	7,231,695,030
Sum	221,665	348,246,842	3,369,660	4,871,138,710	128,441,156	187,519,579,272
Checksum	221,665	348,246,842	3,369,660	4,871,138,710	128,441,156	187,519,579,271

Table F.6 Five-Year Stability Sample, State Attribution, Unduplicated Projected Trend

	Upper Bound Prescriptions (%)	Lower Bound Prescriptions (%)	Upper Bound Prescriptions (n)	Lower Bound Prescriptions (n)
2008	1.7512	0.1927	4,295,445	472,782
2009	1.5368	0.1368	3,882,450	345,561
2010	1.3530	0.1071	3,532,179	279,637
2011	1.2795	0.0945	3,362,412	248,451
2012	1.2685	0.0834	3,369,660	221,665



	Upper Bound Milligrams (%)	Lower Bound Milligrams (%)	Upper Bound Milligrams (n)	Lower Bound Milligrams (n)
2008	2.9492	0.3825	6,551,225,405	849,599,352
2009	2.7431	0.2865	6,093,491,236	636,360,172
2010	2.4804	0.2299	5,509,900,609	510,609,476
2011	2.3393	0.2000	5,196,533,648	444,249,460
2012	2.1928	0.1568	4,871,138,710	348,246,842



Appendix G

Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected: 2008-2012

Table G.1a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2008 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	34.1614%	3.5661%	0.2371%	0.0255%	0.0042%	0.0011%
Milligrams		55.9782%	6.9368%	0.6444%	0.0890%	0.0142%	0.0049%
Cash		52.1423%	13.5204%	1.8066%	0.1126%	0.1772%	0.1282%
Cash/Total | Contingency		6.2255%	12.9314%	19.1632%	13.9499%	75.1012%	91.1746%
Prescriptions	2	10.4968%	4.3258%	0.3472%	0.0252%	0.0030%	0.0053%
Milligrams		12.9966%	5.7841%	0.6490%	0.0624%	0.0133%	0.0254%
Cash		9.5634%	16.1569%	2.2059%	0.1773%	0.0391%	0.1261%
Cash/Total | Contingency		4.8540%	20.4259%	23.6731%	22.2398%	28.5896%	52.5958%
Prescriptions	3	0.6462%	0.4573%	0.2968%	0.0357%	0.0019%	0.0006%
Milligrams		0.8417%	0.6895%	0.4508%	0.0673%	0.0062%	0.0024%
Cash		0.6710%	1.8726%	2.1679%	0.3027%	0.0126%	0.0037%
Cash/Total | Contingency		4.6297%	18.4910%	39.3637%	32.6442%	11.6209%	3.8681%
Prescriptions	4	0.0333%	0.0322%	0.0303%	0.0319%	0.0092%	0.0029%
Milligrams		0.0486%	0.0522%	0.0564%	0.0486%	0.0172%	0.0049%
Cash		0.0529%	0.0553%	0.2950%	0.2957%	0.1351%	0.0429%
Cash/Total | Contingency		6.4609%	9.1318%	39.3418%	45.8198%	46.7637%	10.2949%
Prescriptions	5	0.0035%	0.0035%	0.0023%	0.0046%	0.0046%	0.0023%
Milligrams		0.0089%	0.0083%	0.0042%	0.0103%	0.0088%	0.0097%
Cash		0.0049%	0.0105%	0.0059%	0.2172%	0.0554%	0.5315%
Cash/Total | Contingency		3.6481%	10.0368%	7.7029%	72.8239%	28.1800%	91.2116%
Prescriptions	6	0.0003%	0.0001%	0.0008%	0.0004%	0.0009%	0.0012%
Milligrams		0.0017%	0.0001%	0.0020%	0.0015%	0.0009%	0.0014%
Cash		0.0024%	0.0000%	0.0031%	0.0174%	0.0257%	0.0543%
Cash/Total | Contingency		29.4641%	0.0000%	11.1271%	65.8288%	38.1355%	76.9539%

Table G.1b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2008 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	83,626,896	8,729,697	580,316	62,327	10,258	2,575
Milligrams		123,454,991,020	15,298,538,276	1,421,111,067	196,387,406	31,254,919	10,704,936
Cash		$426,898,632	$110,694,219	$14,791,243	$921,819	$1,450,498	$1,049,999
Cash/Prescription		$5	$13	$25	$15	$141	$408
Prescriptions	2	25,696,054	10,589,446	849,989	61,803	7,437	12,918
Milligrams		28,662,926,693	12,756,399,055	1,431,342,343	137,659,442	29,256,870	55,976,423
Cash		$78,297,339	$132,279,130	$18,060,203	$1,451,657	$319,786	$1,032,584
Cash/Prescription		$3	$12	$21	$23	$43	$80
Prescriptions	3	1,582,006	1,119,549	726,579	87,392	4,682	1,481
Milligrams		1,856,221,067	1,520,622,965	994,195,504	148,478,544	13,564,290	5,295,112
Cash		$5,493,437	$15,331,590	$17,748,679	$2,478,481	$103,142	$30,266
Cash/Prescription		$3	$14	$24	$28	$22	$20
Prescriptions	4	81,626	78,890	74,226	78,093	22,461	7,074
Milligrams		107,211,383	115,072,949	124,397,584	107,287,994	37,986,704	10,809,978
Cash		$432,709	$453,060	$2,415,270	$2,420,826	$1,106,356	$351,306
Cash/Prescription		$5	$6	$33	$31	$49	$50
Prescriptions	5	8,463	8,488	5,548	11,321	11,192	5,583
Milligrams		19,718,044	18,318,923	9,199,811	22,716,785	19,514,252	21,413,310
Cash		$40,511	$86,085	$48,012	$1,777,902	$453,559	$4,351,083
Cash/Prescription		$5	$10	$9	$157	$41	$779
Prescriptions	6	831	165	2,003	1,057	2,187	2,994
Milligrams		3,712,337	240,839	4,505,538	3,229,242	1,925,549	3,159,809
Cash		$19,681	$0	$25,375	$142,506	$210,040	$444,754
Cash/Prescription		$24	$0	$13	$135	$96	$149

Table G.2a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2009 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	34.5874%	3.4596%	0.2119%	0.0236%	0.0029%	0.0003%
Milligrams		56.3168%	7.0615%	0.5906%	0.0814%	0.0117%	0.0022%
Cash		52.6363%	11.1593%	1.2252%	0.0901%	0.1266%	0.0179%
Cash/Total | Contingency		6.2109%	10.2460%	13.5141%	9.1530%	61.9595%	56.8157%
Prescriptions	2	10.3279%	3.8385%	0.2845%	0.0186%	0.0025%	0.0034%
Milligrams		12.5774%	5.1947%	0.5761%	0.0426%	0.0089%	0.0095%
Cash		9.7320%	12.9972%	1.7375%	0.0983%	0.0203%	0.0186%
Cash/Total | Contingency		5.1048%	17.3120%	18.6762%	12.9936%	24.7296%	14.9889%
Prescriptions	3	0.5940%	0.3930%	0.1948%	0.0211%	0.0011%	0.0004%
Milligrams		0.7480%	0.5770%	0.3086%	0.0405%	0.0025%	0.0014%
Cash		0.6916%	1.5396%	1.3243%	0.1810%	0.0084%	0.0020%
Cash/Total | Contingency		5.1872%	17.1663%	29.6865%	26.3699%	11.7622%	5.4853%
Prescriptions	4	0.0276%	0.0269%	0.0207%	0.0144%	0.0041%	0.0012%
Milligrams		0.0386%	0.0428%	0.0403%	0.0227%	0.0068%	0.0054%
Cash		0.0491%	0.0498%	0.1468%	0.1300%	0.0594%	0.0408%
Cash/Total | Contingency		6.5407%	8.7430%	23.2670%	36.5057%	45.8237%	60.7852%
Prescriptions	5	0.0027%	0.0016%	0.0015%	0.0022%	0.0021%	0.0008%
Milligrams		0.0072%	0.0034%	0.0017%	0.0055%	0.0039%	0.0029%
Cash		0.0070%	0.0056%	0.0023%	0.1118%	0.0260%	0.1148%
Cash/Total | Contingency		4.3284%	10.7430%	7.3276%	60.7946%	35.6958%	92.2150%
Prescriptions	6	0.0015%	0.0001%	0.0004%	0.0002%	0.0002%	0.0004%
Milligrams		0.0088%	0.0001%	0.0006%	0.0008%	0.0002%	0.0007%
Cash		0.0016%	0.0000%	0.0007%	0.0075%	0.0036%	0.0312%
Cash/Total | Contingency		5.9006%	0.0000%	8.1112%	56.3967%	46.8951%	83.7822%

Table G.2b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2009 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	87,172,428	8,719,337	534,054	59,523	7,318	859
Milligrams		133,890,941,038	16,788,434,097	1,404,194,709	193,621,046	27,930,578	5,210,420
Cash		$445,950,689	$94,544,859	$10,380,187	$763,409	$1,072,296	$151,406
Cash/Prescription		$5	$11	$19	$13	$147	$176
Prescriptions	2	26,029,901	9,674,415	717,045	46,779	6,289	8,534
Milligrams		29,902,180,537	12,350,251,028	1,369,542,969	101,173,389	21,157,088	22,649,834
Cash		$82,452,217	$110,116,075	$14,720,665	$832,741	$172,307	$157,381
Cash/Prescription		$3	$11	$21	$18	$27	$18
Prescriptions	3	1,497,013	990,393	490,920	53,163	2,754	960
Milligrams		1,778,410,307	1,371,780,275	733,718,990	96,186,186	5,928,746	3,293,844
Cash		$5,859,488	$13,043,723	$11,219,837	$1,533,244	$70,948	$17,154
Cash/Prescription		$4	$13	$23	$29	$26	$18
Prescriptions	4	69,486	67,866	52,120	36,306	10,300	3,107
Milligrams		91,714,680	101,783,231	95,867,904	53,854,370	16,199,275	12,733,188
Cash		$416,315	$422,112	$1,243,546	$1,101,345	$502,854	$345,478
Cash/Prescription		$6	$6	$24	$30	$49	$111
Prescriptions	5	6,744	4,072	3,674	5,529	5,368	1,998
Milligrams		17,186,856	8,030,964	4,135,709	13,076,946	9,222,168	6,783,886
Cash		$58,929	$47,596	$19,846	$947,423	$220,567	$972,966
Cash/Prescription		$9	$12	$5	$171	$41	$487
Prescriptions	6	3,858	127	990	430	535	1,074
Milligrams		20,895,096	230,902	1,454,188	1,853,484	470,330	1,756,075
Cash		$13,937	$0	$6,334	$63,623	$30,803	$264,413
Cash/Prescription		$4	$0	$6	$148	$58	$246

Table G.3a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2010 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	34.6663%	3.2216%	0.1688%	0.0146%	0.0020%	0.0004%
Milligrams		57.0446%	6.4547%	0.4576%	0.0431%	0.0092%	0.0068%
Cash		53.6363%	8.6264%	0.7830%	0.0519%	0.1052%	0.1551%
Cash/Total | Contingency		7.6855%	10.4655%	13.5939%	13.2051%	70.8541%	95.5445%
Prescriptions	2	10.1046%	3.3322%	0.2244%	0.0141%	0.0015%	0.0016%
Milligrams		12.1158%	4.4714%	0.4213%	0.0354%	0.0067%	0.0097%
Cash		8.7404%	11.4933%	1.3201%	0.0838%	0.0236%	0.0515%
Cash/Total | Contingency		5.9967%	21.1715%	23.6814%	20.0233%	46.6005%	45.4280%
Prescriptions	3	0.5576%	0.3298%	0.1468%	0.0140%	0.0005%	0.0001%
Milligrams		0.6789%	0.4642%	0.2247%	0.0225%	0.0012%	0.0000%
Cash		0.5402%	1.3914%	1.1210%	0.0904%	0.0024%	0.0001%
Cash/Total | Contingency		6.0952%	22.5814%	40.5243%	26.5611%	9.2129%	5.6699%
Prescriptions	4	0.0246%	0.0212%	0.0143%	0.0101%	0.0022%	0.0002%
Milligrams		0.0347%	0.0305%	0.0208%	0.0131%	0.0030%	0.0001%
Cash		0.0310%	0.0394%	0.1190%	0.0725%	0.0278%	0.0013%
Cash/Total | Contingency		6.2186%	11.5290%	44.0718%	40.1834%	46.1947%	78.6578%
Prescriptions	5	0.0020%	0.0012%	0.0009%	0.0014%	0.0013%	0.0001%
Milligrams		0.0060%	0.0025%	0.0014%	0.0019%	0.0018%	0.0006%
Cash		0.0013%	0.0055%	0.0032%	0.0268%	0.0088%	0.0287%
Cash/Total | Contingency		1.6536%	14.6511%	21.9379%	58.8641%	14.4583%	60.3963%
Prescriptions	6	0.0004%	0.0000%	0.0001%	0.0000%	0.0002%	0.0001%
Milligrams		0.0037%	0.0000%	0.0001%	0.0002%	0.0001%	0.0002%
Cash		0.0115%	0.0000%	0.0003%	0.0001%	0.0027%	0.0081%
Cash/Total | Contingency		56.2627%	0.0000%	24.6675%	8.7841%	35.5033%	42.9752%

Table G.3b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2010 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	90,277,919	8,389,669	439,606	38,037	5,261	914
Milligrams		146,542,363,623	16,581,618,775	1,175,626,553	110,791,202	23,674,373	17,404,034
Cash		$578,297,444	$93,008,656	$8,441,708	$559,212	$1,134,385	$1,672,521
Cash/Prescription		$6	$11	$19	$15	$216	$1,830
Prescriptions	2	26,314,524	8,677,614	584,483	36,773	3,937	4,113
Milligrams		31,124,416,771	11,486,674,027	1,082,231,506	90,842,121	17,181,698	24,800,230
Cash		$94,237,382	$123,918,935	$14,233,585	$903,652	$254,928	$555,775
Cash/Prescription		$4	$14	$24	$25	$65	$135
Prescriptions	3	1,452,042	858,785	382,205	36,555	1,364	214
Milligrams		1,744,040,389	1,192,454,168	577,179,808	57,732,974	3,207,626	102,221
Cash		$5,824,673	$15,001,892	$12,086,191	$974,259	$26,160	$947
Cash/Prescription		$4	$17	$32	$27	$19	$4
Prescriptions	4	63,985	55,274	37,342	26,235	5,814	438
Milligrams		89,196,167	78,390,165	53,450,567	33,720,274	7,630,364	281,698
Cash		$333,879	$424,943	$1,282,975	$781,574	$299,456	$13,683
Cash/Prescription		$5	$8	$34	$30	$52	$31
Prescriptions	5	5,131	3,109	2,423	3,653	3,423	358
Milligrams		15,348,061	6,347,444	3,604,127	4,875,578	4,668,674	1,527,751
Cash		$13,975	$59,235	$34,306	$289,406	$95,377	$309,237
Cash/Prescription		$3	$19	$14	$79	$28	$863
Prescriptions	6	1,023	10	228	97	449	331
Milligrams		9,536,929	16,698	146,258	424,933	360,282	544,064
Cash		$123,697	$0	$3,173	$626	$28,826	$87,666
Cash/Prescription		$121	$0	$14	$6	$64	$265

Table G.4a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2011 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	35.0519%	3.2834%	0.1682%	0.0123%	0.0013%	0.0006%
Milligrams		57.5991%	6.6566%	0.4637%	0.0376%	0.0015%	0.0015%
Cash		54.2998%	8.0320%	0.6132%	0.0306%	0.0185%	0.0203%
Cash/Total | Contingency		7.3883%	9.6628%	10.4284%	6.7116%	52.2198%	61.0105%
Prescriptions	2	10.0930%	3.1172%	0.1981%	0.0109%	0.0014%	0.0014%
Milligrams		12.0040%	4.0204%	0.3794%	0.0288%	0.0042%	0.0023%
Cash		9.0113%	10.2613%	1.0553%	0.0941%	0.0259%	0.0074%
Cash/Total | Contingency		5.8976%	20.4042%	21.0184%	27.1175%	60.0149%	27.3383%
Prescriptions	3	0.5345%	0.3003%	0.1272%	0.0109%	0.0005%	0.0000%
Milligrams		0.6469%	0.4074%	0.1875%	0.0195%	0.0011%	0.0000%
Cash		0.4945%	1.1150%	0.9647%	0.1055%	0.0031%	0.0000%
Cash/Total | Contingency		5.6291%	20.5619%	39.2204%	42.9361%	13.1665%	2.1839%
Prescriptions	4	0.0222%	0.0189%	0.0125%	0.0093%	0.0023%	0.0002%
Milligrams		0.0325%	0.0247%	0.0183%	0.0125%	0.0034%	0.0004%
Cash		0.0249%	0.0280%	0.0862%	0.0644%	0.0209%	0.0040%
Cash/Total | Contingency		5.4719%	10.9540%	38.2684%	45.8709%	44.3641%	21.8274%
Prescriptions	5	0.0014%	0.0009%	0.0006%	0.0013%	0.0012%	0.0005%
Milligrams		0.0049%	0.0010%	0.0006%	0.0026%	0.0025%	0.0026%
Cash		0.0024%	0.0013%	0.0008%	0.0343%	0.0060%	0.0738%
Cash/Total | Contingency		6.3576%	12.3528%	13.6529%	72.0156%	16.1093%	77.3172%
Prescriptions	6	0.0001%	.	0.0000%	0.0001%	0.0002%	0.0002%
Milligrams		0.0004%	.	0.0001%	0.0002%	0.0001%	0.0001%
Cash		0.0009%	.	0.0001%	0.0013%	0.0012%	0.0020%
Cash/Total | Contingency		49.8959%	.	59.1100%	67.5298%	22.1220%	36.1413%

Table G.4b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2011 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	91,869,884	8,605,741	440,917	32,309	3,365	1,589
Milligrams		148,988,945,598	17,218,218,078	1,199,312,633	97,175,049	3,881,166	3,764,016
Cash		$555,802,570	$82,213,682	$6,276,386	$313,012	$189,040	$207,820
Cash/Prescription		$6	$10	$14	$10	$56	$131
Prescriptions	2	26,453,444	8,170,037	519,105	28,661	3,601	3,645
Milligrams		31,050,070,396	10,399,401,073	981,248,492	74,402,729	10,878,308	6,029,664
Cash		$92,238,079	$105,033,165	$10,802,332	$963,583	$265,395	$76,106
Cash/Prescription		$3	$13	$21	$34	$74	$21
Prescriptions	3	1,400,937	786,951	333,432	28,441	1,292	85
Milligrams		1,673,256,052	1,053,685,818	485,117,200	50,460,953	2,894,991	34,024
Cash		$5,061,879	$11,412,780	$9,873,997	$1,080,300	$31,494	$210
Cash/Prescription		$4	$15	$30	$38	$24	$2
Prescriptions	4	58,304	49,484	32,769	24,368	6,087	596
Milligrams		83,946,331	63,784,796	47,326,309	32,384,996	8,788,840	1,118,642
Cash		$254,440	$286,147	$882,779	$659,509	$213,460	$40,786
Cash/Prescription		$4	$6	$27	$27	$35	$68
Prescriptions	5	3,608	2,283	1,515	3,522	3,167	1,388
Milligrams		12,769,744	2,519,452	1,467,934	6,741,689	6,381,556	6,801,011
Cash		$24,192	$13,115	$7,954	$351,224	$61,548	$755,693
Cash/Prescription		$7	$6	$5	$100	$19	$544
Prescriptions	6	319	.	114	184	617	408
Milligrams		942,377	.	139,580	426,315	343,622	238,189
Cash		$9,706	.	$1,319	$12,895	$12,683	$20,981
Cash/Prescription		$30	.	$12	$70	$21	$51

Table G.5a Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2012 (Percent)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	35.6857%	3.3556%	0.1579%	0.0083%	0.0008%	0.0001%
Milligrams		57.4378%	6.9987%	0.4542%	0.0262%	0.0022%	0.0004%
Cash		56.1395%	6.6269%	0.5055%	0.0517%	0.0089%	0.0020%
Cash/Total | Contingency		6.9039%	6.8144%	7.4839%	13.1016%	33.3530%	40.6794%
Prescriptions	2	10.5538%	2.8561%	0.1640%	0.0100%	0.0008%	0.0002%
Milligrams		12.2772%	3.5201%	0.3002%	0.0210%	0.0019%	0.0006%
Cash		9.6853%	5.8804%	0.6115%	0.0590%	0.0088%	0.0047%
Cash/Total | Contingency		5.5857%	12.0574%	13.9004%	18.2681%	32.9770%	70.3840%
Prescriptions	3	0.5595%	0.2826%	0.0943%	0.0090%	0.0008%	0.0002%
Milligrams		0.6498%	0.3479%	0.1196%	0.0140%	0.0015%	0.0003%
Cash		0.6982%	0.6401%	0.4415%	0.0579%	0.0080%	0.0018%
Cash/Total | Contingency		6.7185%	12.4745%	26.0470%	28.7984%	36.1415%	40.6873%
Prescriptions	4	0.0224%	0.0174%	0.0103%	0.0059%	0.0011%	0.0002%
Milligrams		0.0289%	0.0227%	0.0128%	0.0072%	0.0017%	0.0003%
Cash		0.0379%	0.0662%	0.0483%	0.0454%	0.0087%	0.0042%
Cash/Total | Contingency		7.6545%	18.8789%	25.4744%	34.1562%	32.0377%	56.4028%
Prescriptions	5	0.0009%	0.0008%	0.0008%	0.0008%	0.0008%	0.0003%
Milligrams		0.0027%	0.0013%	0.0009%	0.0008%	0.0011%	0.0004%
Cash		0.0028%	0.0031%	0.0017%	0.0067%	0.0072%	0.0024%
Cash/Total | Contingency		9.2603%	15.3344%	17.9511%	39.5830%	30.5168%	34.7439%
Prescriptions	6	0.0001%	0.0000%	0.0001%	0.0001%	0.0002%	0.0002%
Milligrams		0.0008%	0.0000%	0.0001%	0.0001%	0.0001%	0.0002%
Cash		0.0005%	0.0000%	0.0001%	0.0006%	0.0014%	0.0023%
Cash/Total | Contingency		14.8992%	0.0000%	23.6311%	51.8375%	33.2069%	45.0432%

Table G.5b Five-Year Stability Sample, Zip-Three Attribution, Duplicated, Projected, 2012 (Number)

Pharmacies / Doctors		1	2	3	4	5	6
Prescriptions	1	94,488,051	8,884,902	418,000	21,858	2,091	323
Milligrams		148,054,526,549	18,040,179,263	1,170,667,670	67,603,042	5,613,845	935,668
Cash		$517,683,141	$61,109,256	$4,661,147	$477,138	$81,894	$18,493
Cash/Prescription		$5	$7	$11	$22	$39	$57
Prescriptions	2	27,944,216	7,562,375	434,119	26,460	2,211	639
Milligrams		31,646,266,847	9,073,513,394	773,864,583	54,100,031	4,869,236	1,581,045
Cash		$89,311,529	$54,225,407	$5,638,767	$543,843	$81,205	$43,665
Cash/Prescription		$3	$7	$13	$21	$37	$68
Prescriptions	3	1,481,485	748,294	249,694	23,871	2,130	508
Milligrams		1,674,876,159	896,871,159	308,218,831	36,206,093	3,971,703	719,755
Cash		$6,438,325	$5,902,267	$4,071,290	$533,502	$73,705	$16,226
Cash/Prescription		$4	$8	$16	$22	$35	$32
Prescriptions	4	59,400	45,997	27,209	15,576	2,818	454
Milligrams		74,523,819	58,542,430	33,026,487	18,478,988	4,281,707	647,615
Cash		$349,661	$610,682	$445,269	$418,599	$79,840	$39,160
Cash/Prescription		$6	$13	$16	$27	$28	$86
Prescriptions	5	2,468	2,232	2,171	2,110	2,076	663
Milligrams		6,865,748	3,356,737	2,250,642	2,175,386	2,817,876	980,202
Cash		$25,451	$28,882	$15,689	$62,181	$66,401	$22,538
Cash/Prescription		$10	$13	$7	$29	$32	$34
Prescriptions	6	359	61	232	309	498	538
Milligrams		2,121,797	38,107	149,315	242,051	347,243	421,139
Cash		$4,366	$0	$895	$5,561	$12,778	$20,760
Cash/Prescription		$12	$0	$4	$18	$26	$39

Appendix H

Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected: 2008-2012

Table H.1a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2008 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.1798%	1.7070%	47.3760%
Milligrams		0.3505%	2.8461%	71.7661%
Cash		0.9857%	6.1005%	73.0391%
Cash/Total | Contingency		22.6464%	14.0022%	6.8708%

		Lower	Upper	All
Prescriptions		440,267	4,178,643	115,976,056
Milligrams		773,086,199	6,276,742,990	158,273,962,437
Cash		$8,069,925	$49,946,077	$597,984,718
Cash/Prescription		$18	$12	$5

Table H.1b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2008
(Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	.	.
BUPRENORPHINE	1,928	11,884,221	34,474	134,892,881	2,066,530	5,795,472,077
BUTORPHANOL_TARTRATE	1,748	536,209	12,386	3,082,034	320,940	98,744,664
CODEINE	16,309	7,937,360	148,078	55,377,450	4,571,327	1,769,431,556
DIHYDROCODONE	27	12,684	1,923	927,320	35,517	16,100,049
FENTANYL	15,100	1,731,896	198,576	24,205,298	4,657,636	577,406,524
HYDROCODONE	170,139	108,153,433	1,594,985	988,749,135	50,304,359	32,912,209,652
HYDROMORPHONE	7,619	10,280,731	88,138	138,214,827	1,420,768	2,540,565,324
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	.	.	365	2,355,725	8,101	24,824,084
MEPERIDINE	1,796	923,135	21,301	5,589,069	503,570	146,110,801
METHADONE_HCL	7,855	39,712,900	99,098	501,411,360	3,043,990	15,133,847,253
MORPHINE	15,569	53,580,130	202,507	648,527,866	5,426,055	18,171,516,569
OXYCODONE	163,853	511,151,410	1,406,093	3,492,880,850	27,777,388	67,221,282,920
OXYMORPHONE_HCL	2,100	8,167,448	28,770	103,229,299	482,111	1,968,806,641
PENTAZOCINE	529	1,523,816	3,821	5,250,897	136,188	183,726,157
PROPOXYPHENE	.	.	.	.	5,369,952	6,686,635,167
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	.	.	.	.	.	.
TRAMADOL_HCL	35,697	17,490,826	338,128	172,048,979	9,851,623	5,027,282,998
Sum	440,267	773,086,199	4,178,643	6,276,742,990	115,976,056	158,273,962,438
Checksum	440,267	773,086,199	4,178,643	6,276,742,990	115,976,056	158,273,962,437

Table H.2a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2009 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.1291%	1.4827%	47.4240%
Milligrams		0.2528%	2.4428%	71.6552%
Cash		0.6110%	4.8552%	72.1959%
Cash/Total | Contingency		16.0268%	12.2324%	6.7421%

		Lower	Upper	All
Prescriptions		325,345	3,736,950	119,525,300
Milligrams		601,030,682	5,807,554,213	170,357,592,577
Cash		$5,176,628	$41,135,075	$611,665,905
Cash/Prescription		$16	$11	$5

Table H.2b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2009
(Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	1	12
BUPRENORPHINE	3,219	26,405,226	40,047	169,679,511	2,856,529	7,945,413,958
BUTORPHANOL_TARTRATE	1,612	496,919	14,320	3,614,013	297,147	95,661,569
CODEINE	9,467	3,598,008	122,095	44,519,429	4,187,205	1,618,720,523
DIHYDROCODONE	24	21,315	832	535,667	24,755	11,253,405
FENTANYL	14,203	1,625,831	174,454	20,723,462	4,519,096	560,517,754
HYDROCODONE	108,520	63,567,486	1,324,124	794,765,158	51,346,632	34,609,746,071
HYDROMORPHONE	8,739	13,825,606	90,727	143,748,455	1,618,417	2,935,168,878
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	.	.	43	223,559	7,729	28,092,509
MEPERIDINE	1,320	534,703	15,324	4,516,247	345,215	113,571,059
METHADONE_HCL	6,667	34,328,872	87,909	427,497,515	3,139,203	15,439,252,534
MORPHINE	14,517	48,852,706	199,280	623,096,688	5,992,430	19,712,173,615
OXYCODONE	124,757	384,526,145	1,289,355	3,231,803,664	29,011,459	72,484,046,221
OXYMORPHONE_HCL	2,257	7,735,066	39,813	156,083,614	708,060	2,995,782,794
PENTAZOCINE	156	355,115	2,978	3,615,054	101,387	139,187,789
PROPOXYPHENE	.	.	.	.	4,673,676	5,952,929,789
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	263	489,951	4,360	10,802,914	82,096	175,812,556
TRAMADOL_HCL	29,624	14,667,732	331,289	172,329,264	10,614,262	5,540,261,543
Sum	325,345	601,030,682	3,736,950	5,807,554,213	119,525,300	170,357,592,577
Checksum	325,345	601,030,682	3,736,950	5,807,554,213	119,525,300	170,357,592,577

Table H.3a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2010 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.1006%	1.3175%	47.0489%
Milligrams		0.1805%	2.0707%	71.7426%
Cash		0.4119%	3.8154%	71.2446%
Cash/Total | Contingency		18.7251%	14.5443%	8.1793%

		Lower	Upper	All
Prescriptions		261,853	3,431,157	122,524,725
Milligrams		463,731,095	5,319,360,200	184,300,205,476
Cash		$4,440,740	$41,136,544	$768,148,071
Cash/Prescription		$17	$12	$6

Table H.3b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2010
(Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	27	545
BUPRENORPHINE	1,814	13,202,894	37,329	138,158,910	3,431,388	9,493,510,170
BUTORPHANOL_TARTRATE	645	195,819	9,103	2,180,268	269,356	87,083,776
CODEINE	7,646	2,577,583	103,562	37,260,301	3,797,542	1,493,127,750
DIHYDROCODONE	6	3,777	600	268,483	20,287	9,318,816
FENTANYL	11,504	1,292,446	155,205	17,369,003	4,507,564	554,712,516
HYDROCODONE	85,418	50,364,623	1,170,576	703,308,044	50,837,504	35,631,931,066
HYDROMORPHONE	6,677	9,615,978	85,469	134,068,598	1,762,223	3,266,989,206
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	.	.	24	97,568	1,292	4,667,982
MEPERIDINE	391	190,717	10,394	2,998,802	285,795	96,090,235
METHADONE_HCL	5,216	21,430,257	77,280	354,472,021	3,198,083	15,634,375,317
MORPHINE	14,051	49,158,924	194,041	563,684,186	6,471,320	21,183,582,701
OXYCODONE	99,043	290,102,053	1,208,623	2,979,448,312	31,604,119	81,109,136,793
OXYMORPHONE_HCL	2,865	10,599,765	45,572	186,724,803	912,013	4,050,625,721
PENTAZOCINE	277	420,080	2,360	3,054,798	92,272	134,928,035
PROPOXYPHENE	.	.	.	.	3,741,590	4,851,027,019
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	573	1,382,895	12,986	28,991,313	311,050	735,950,897
TRAMADOL_HCL	25,727	13,193,282	318,033	167,274,791	11,281,301	5,963,146,928
Sum	261,853	463,731,095	3,431,157	5,319,360,199	122,524,725	184,300,205,475
Checksum	261,853	463,731,095	3,431,157	5,319,360,200	122,524,725	184,300,205,476

Table H.4a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2011 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0893%	1.2389%	47.3200%
Milligrams		0.1596%	1.9291%	72.0670%
Cash		0.3353%	3.2564%	71.5177%
Cash/Total | Contingency		17.7523%	12.9966%	7.8319%

		Lower	Upper	All
Prescriptions		234,075	3,247,015	124,024,147
Milligrams		412,768,249	4,989,791,559	186,412,430,214
Cash		$3,432,544	$33,331,498	$732,041,546
Cash/Prescription		$15	$10	$6

Table H.4b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2011
(Prescriptions, Milligrams X Drug)

	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	.	.	.	.	34	666
BUPRENORPHINE	1,422	5,718,677	46,645	132,207,183	4,407,904	11,221,285,479
BUTORPHANOL_TARTRATE	758	265,520	7,852	2,049,068	242,360	74,207,968
CODEINE	6,756	2,678,425	98,419	36,157,968	3,856,104	1,512,145,453
DIHYDROCODONE	24	12,327	844	453,566	27,039	10,669,258
FENTANYL	9,572	899,009	147,050	16,193,123	4,558,824	555,775,613
HYDROCODONE	73,864	45,021,780	1,081,168	667,161,265	51,663,699	36,855,907,132
HYDROMORPHONE	6,717	12,201,360	86,530	144,164,859	2,026,071	3,864,903,783
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	.	.	0	0	385	1,717,308
MEPERIDINE	287	76,317	10,351	2,639,517	242,833	84,616,920
METHADONE_HCL	3,883	16,895,255	69,475	306,963,821	3,197,570	15,349,216,343
MORPHINE	14,547	50,260,381	195,548	570,235,708	6,955,273	22,432,600,428
OXYCODONE	86,438	244,549,374	1,094,380	2,597,416,578	32,021,258	79,627,475,594
OXYMORPHONE_HCL	3,857	18,353,925	65,016	298,461,940	1,362,531	6,717,243,941
PENTAZOCINE	203	601,563	2,467	3,519,583	110,447	154,213,691
PROPOXYPHENE	.	.	.	.	2,167	5,988,237
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	1,180	2,543,592	18,913	44,854,463	524,438	1,259,825,423
TRAMADOL_HCL	24,566	12,690,744	322,359	167,312,917	12,825,210	6,684,636,977
Sum	234,075	412,768,249	3,247,015	4,989,791,559	124,024,147	186,412,430,213
Checksum	234,075	412,768,249	3,247,015	4,989,791,559	124,024,147	186,412,430,214

Table H.5a Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2012 (Percent, Number)

		Lower	Upper	All
Prescriptions		0.0808%	1.2323%	48.2338%
Milligrams		0.1288%	1.8153%	72.0272%
Cash		0.3570%	2.8258%	72.2114%
Cash/Total | Contingency		17.6986%	10.2608%	7.1292%

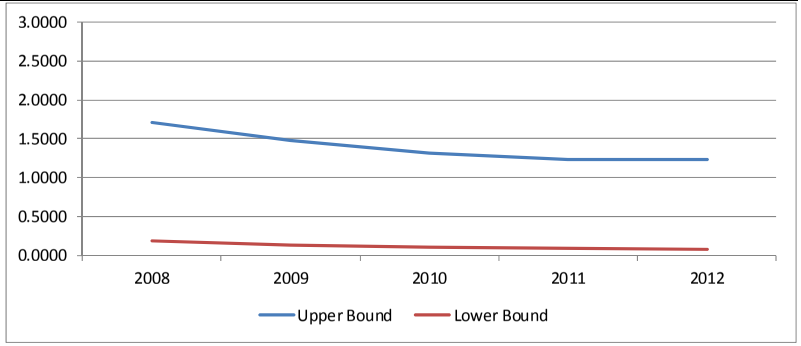
		Lower	Upper	All
Prescriptions		213,980	3,262,813	127,712,567
Milligrams		332,079,196	4,679,201,824	185,660,812,012
Cash		$3,291,991	$26,058,130	$665,887,169
Cash/Prescription		$15	$8	$5

Table H.5b Five-Year Stability Sample, Zip-Three Attribution, Unduplicated, Projected, 2012
(Prescriptions, Milligrams X Drug)

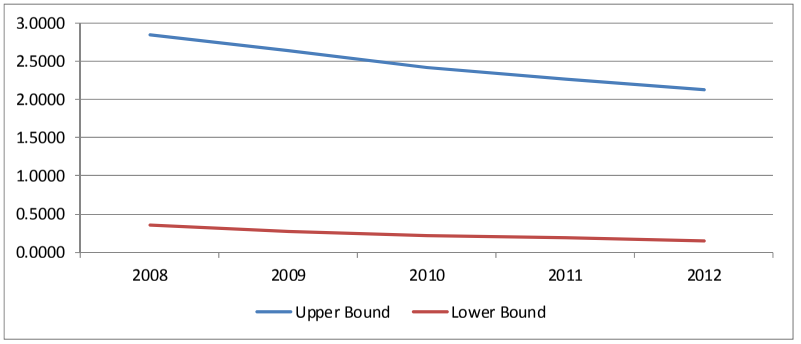
	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)	Prescriptions (n)	Milligrams (n)
Drug Name (Molecule)	Lower		Upper		All	
ALFENTANIL	0	0	0	0	34	1,429
BUPRENORPHINE	3,352	6,737,787	61,623	123,643,194	5,542,642	13,283,588,834
BUTORPHANOL_TARTRATE	938	305,714	8,736	2,374,901	222,280	66,660,885
CODEINE	5,524	2,013,046	93,227	31,183,428	3,532,879	1,362,635,931
DIHYDROCODONE	8	2,025	387	138,929	18,358	7,682,212
FENTANYL	10,332	1,116,587	157,368	16,978,592	4,652,131	550,118,270
HYDROCODONE	66,270	44,588,044	1,068,958	672,292,112	52,165,759	37,414,910,541
HYDROMORPHONE	7,190	12,743,570	99,286	159,994,402	2,321,702	4,535,119,756
LEVOMETHADYL ACETATE	.	.	.	.	.	.
LEVORPHANOL_TARTRATE	0	0	35	134,262	2,413	8,639,336
MEPERIDINE	313	81,637	5,515	1,499,772	202,238	67,151,850
METHADONE_HCL	3,999	18,155,932	69,890	295,103,683	3,105,608	14,108,268,044
MORPHINE	12,261	35,715,711	204,933	575,937,435	7,527,939	23,276,343,448
OXYCODONE	73,051	173,501,459	1,054,576	2,298,726,153	32,373,054	76,890,574,111
OXYMORPHONE_HCL	4,622	20,942,269	55,101	255,778,539	1,064,034	4,940,823,454
PENTAZOCINE	88	95,193	1,700	1,909,819	96,605	131,600,222
PROPOXYPHENE	0	0	0	0	24	28,830
REMIFENTANIL_HCL	.	.	.	.	.	.
SUFENTANIL_CITRATE	.	.	.	.	.	.
TAPENTADOL_HCL	1,395	3,683,909	25,640	65,069,319	686,884	1,816,441,167
TRAMADOL_HCL	24,637	12,396,314	355,838	178,437,282	14,197,983	7,200,223,692
Sum	213,980	332,079,196	3,262,813	4,679,201,824	127,712,567	185,660,812,012
Checksum	213,980	332,079,196	3,262,813	4,679,201,824	127,712,567	185,660,812,012

Table H.6 Five-Year Stability Sample, Zip-Three Attribution, Unduplicated Projected Trend

	Upper Bound Prescriptions (%)	Lower Bound Prescriptions (%)	Upper Bound Prescriptions (n)	Lower Bound Prescriptions (n)
2008	1.7070	0.1798	4,178,643	440,267
2009	1.4827	0.1291	3,736,950	325,345
2010	1.3175	0.1006	3,431,157	261,853
2011	1.2389	0.0893	3,247,015	234,075
2012	1.2323	0.0808	3,262,813	213,980



	Upper Bound Milligrams (%)	Lower Bound Milligrams (%)	Upper Bound Milligrams (n)	Lower Bound Milligrams (n)
2008	2.8461	0.3505	6,276,742,990	773,086,199
2009	2.6333	0.2725	5,807,554,213	601,030,682
2010	2.4120	0.2103	5,319,360,200	463,731,095
2011	2.2625	0.1872	4,989,791,559	412,768,249
2012	2.1217	0.1506	4,679,201,824	332,079,196



Appendix I

Percent Prescriptions Diverted by State:

2008-2012

Figure I.1 Percent Prescriptions Diverted by State: 2008

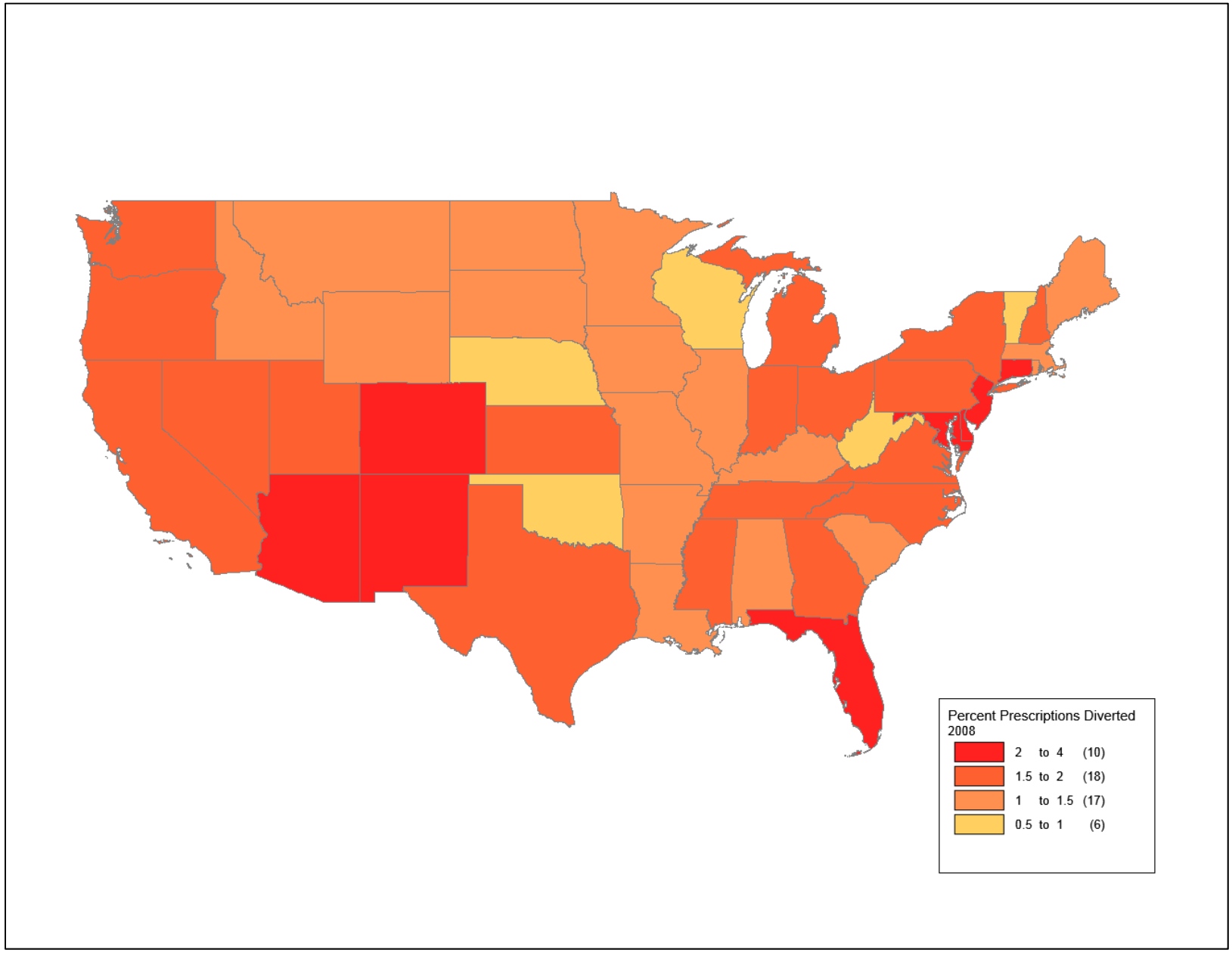


Figure I.2 Percent Prescriptions Diverted by State: 2009

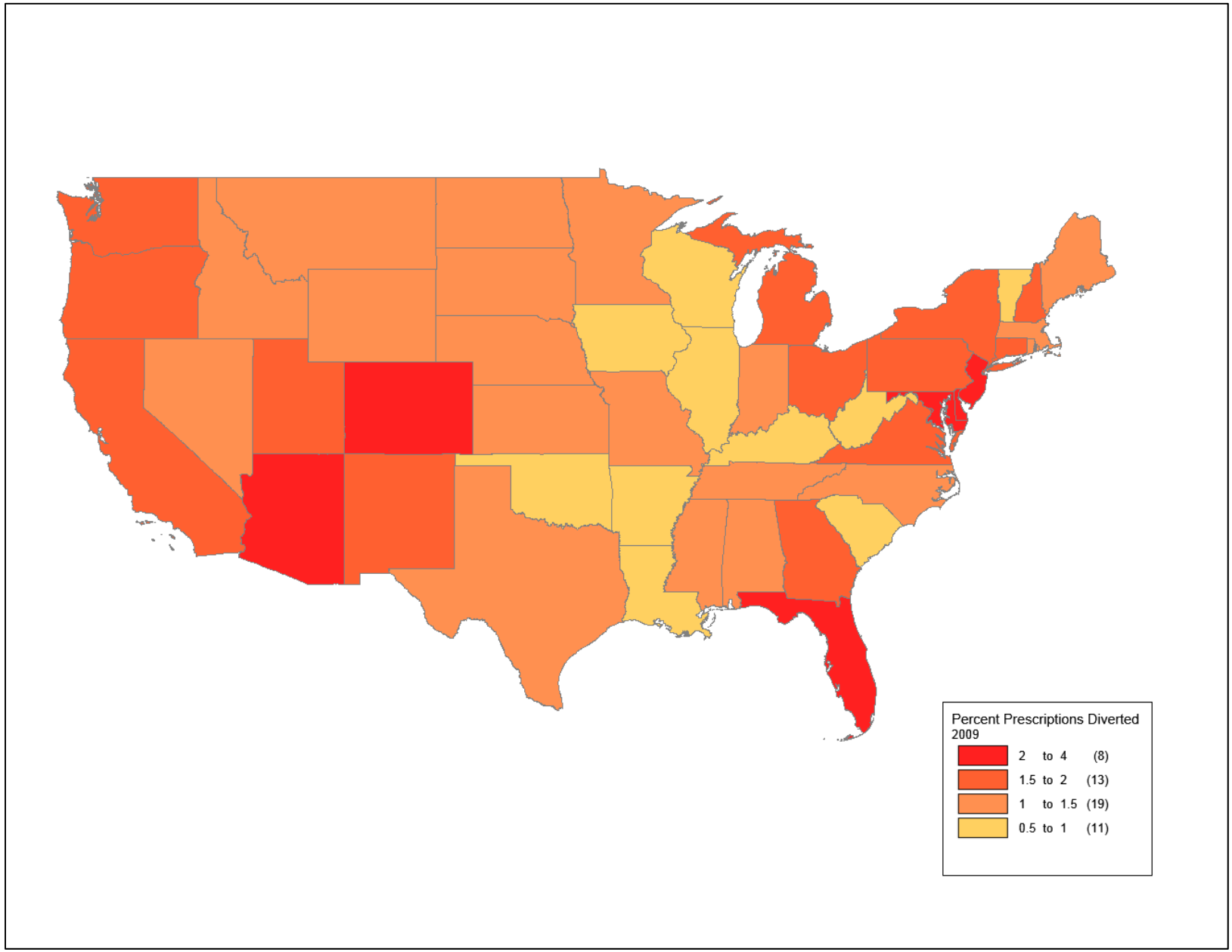


Figure I.3 Percent Prescriptions Diverted by State: 2010

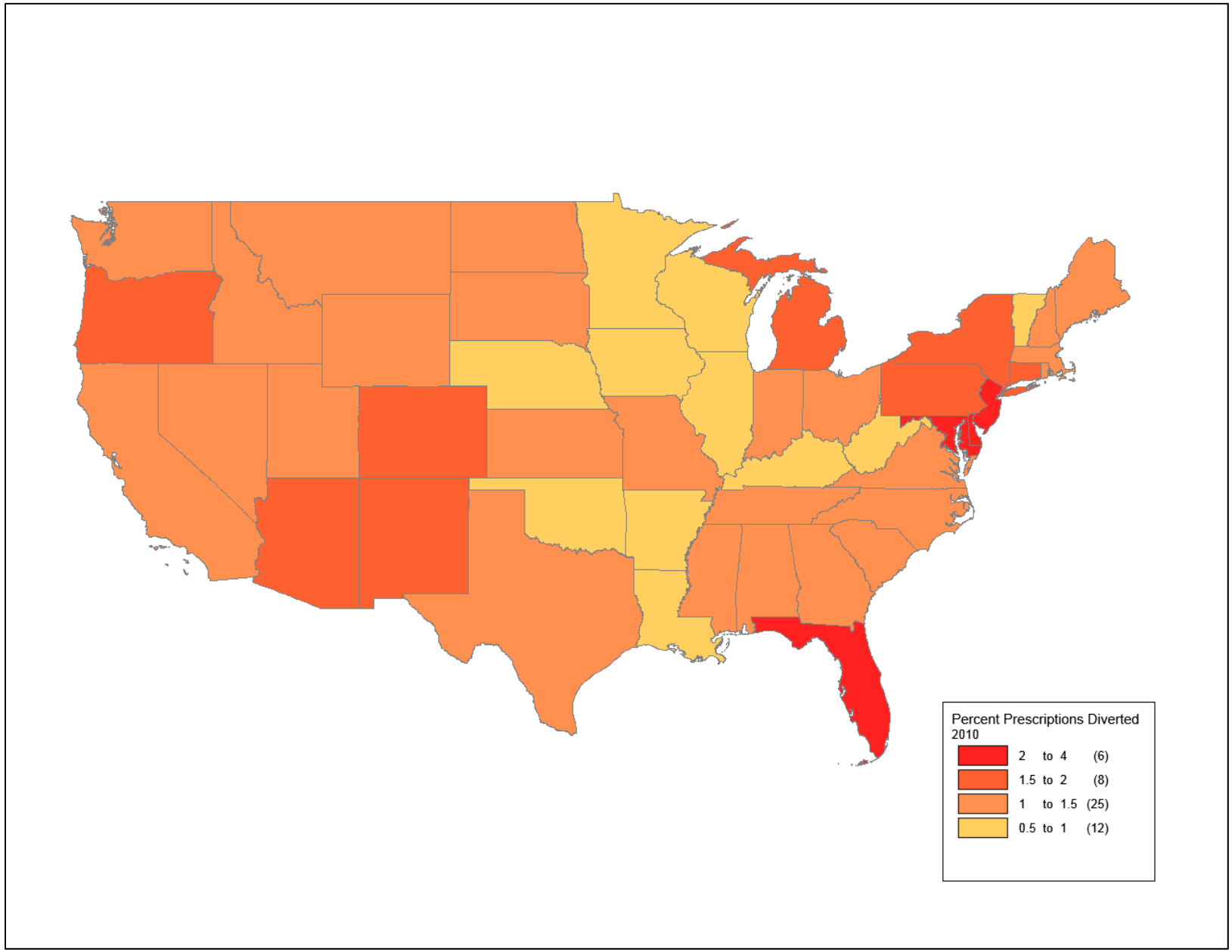


Figure I.4 Percent Prescriptions Diverted by State: 2011

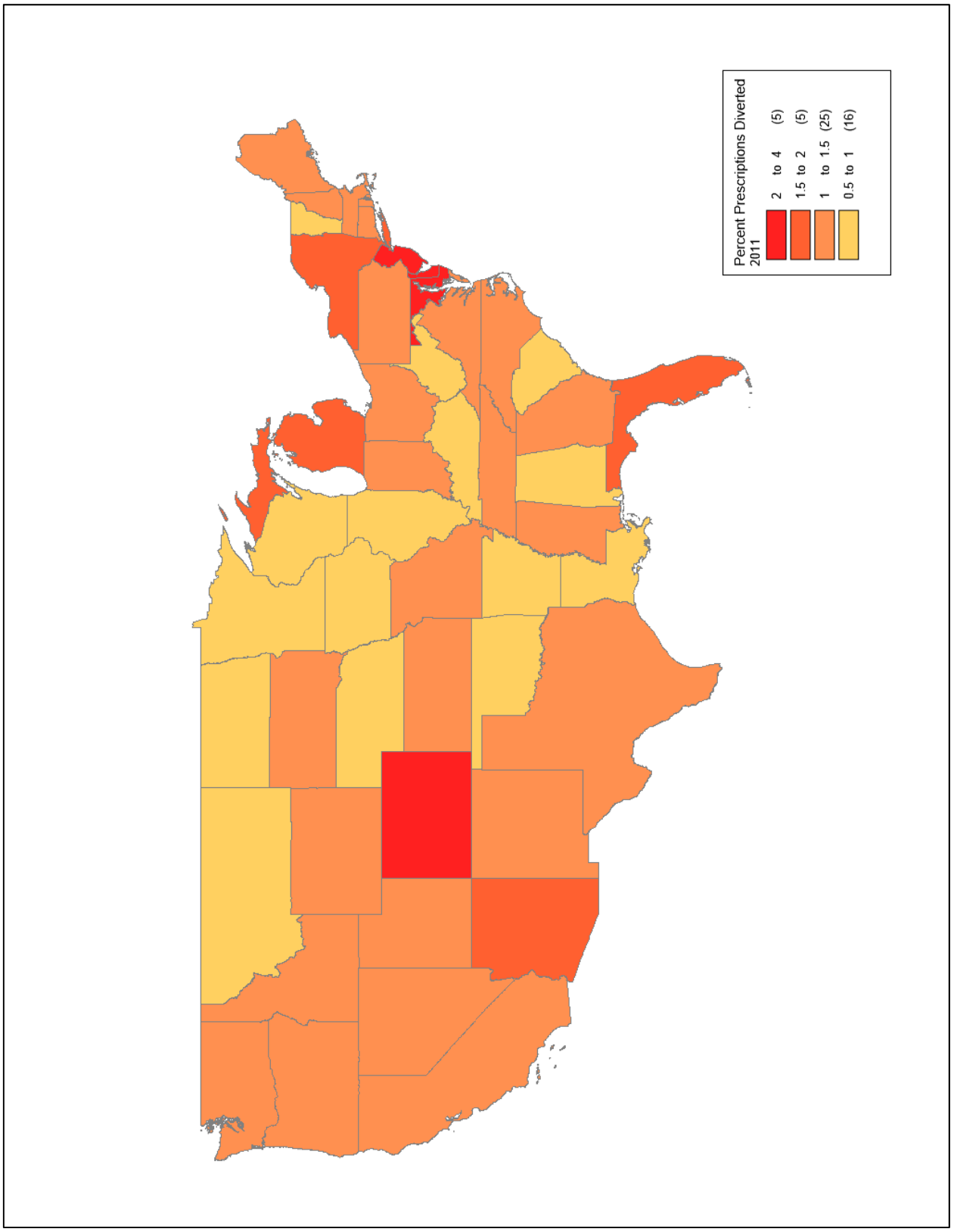
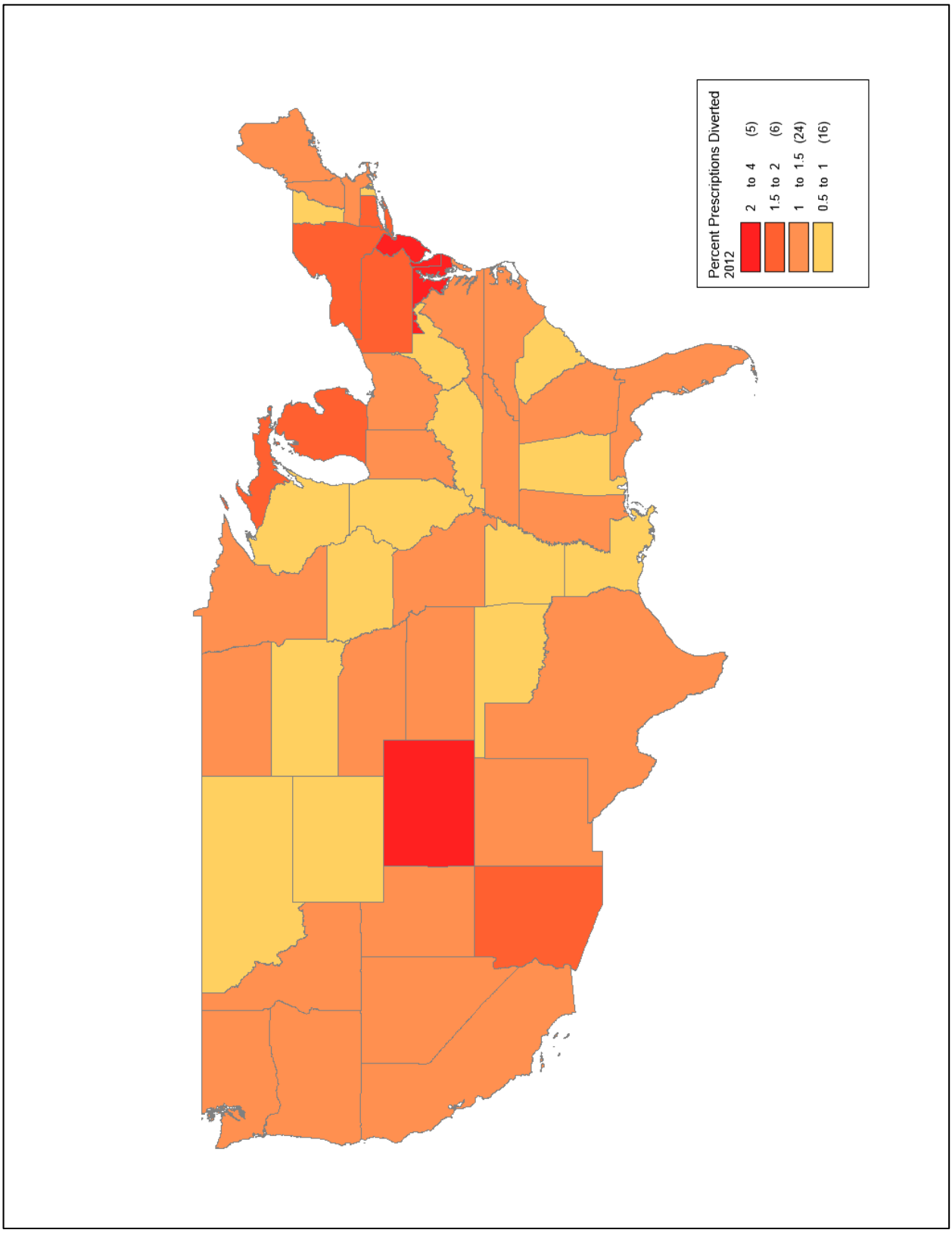


Figure I.5 Percent Prescriptions Diverted by State: 2012



Appendix J

Percent Milligrams Diverted by State:

2008-2012

Figure J.1 Percent Milligrams Diverted by State: 2008

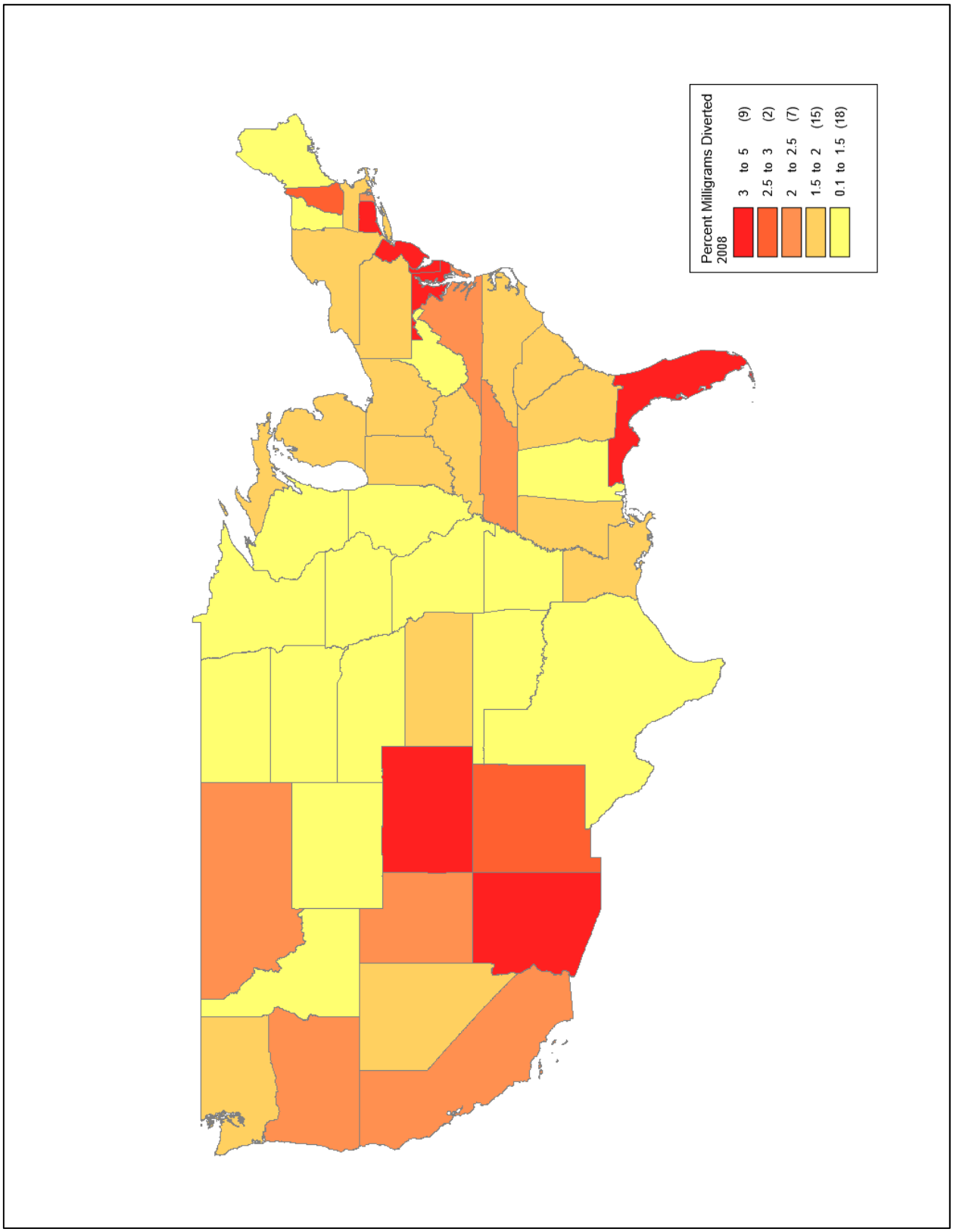


Figure J.2 Percent Milligrams Diverted by State: 2009

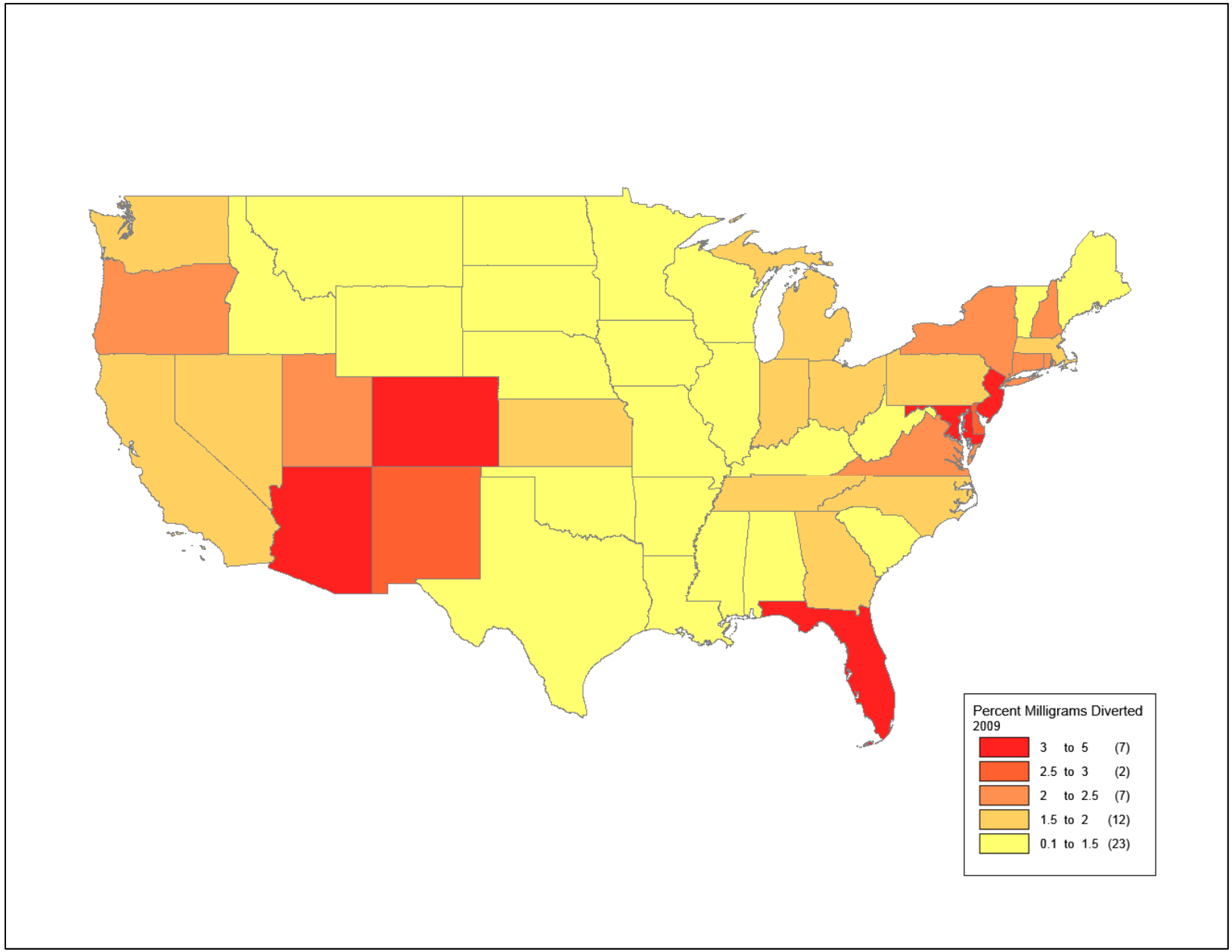


Figure J.3 Percent Milligrams Diverted by State: 2010

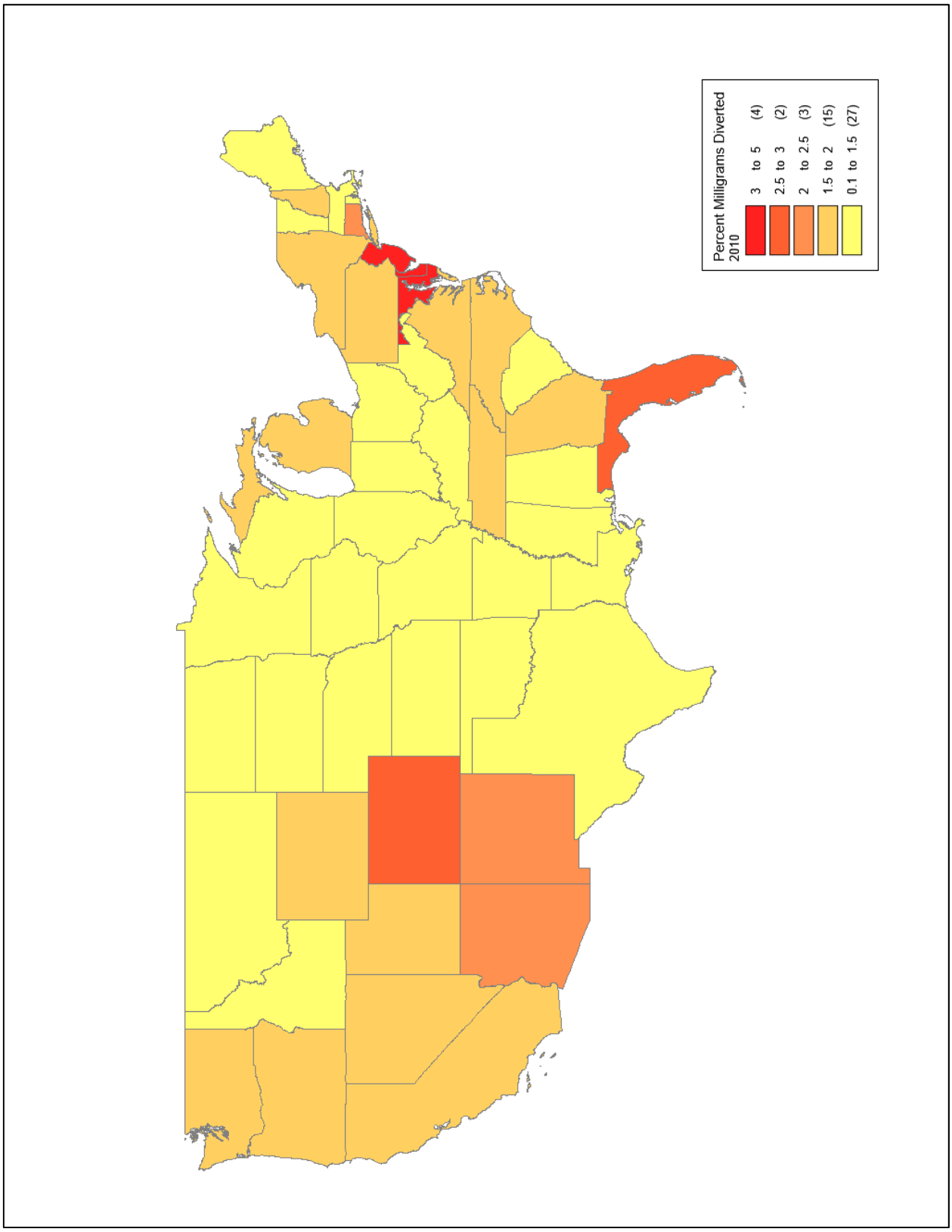


Figure J.4 Percent Milligrams Diverted by State: 2011

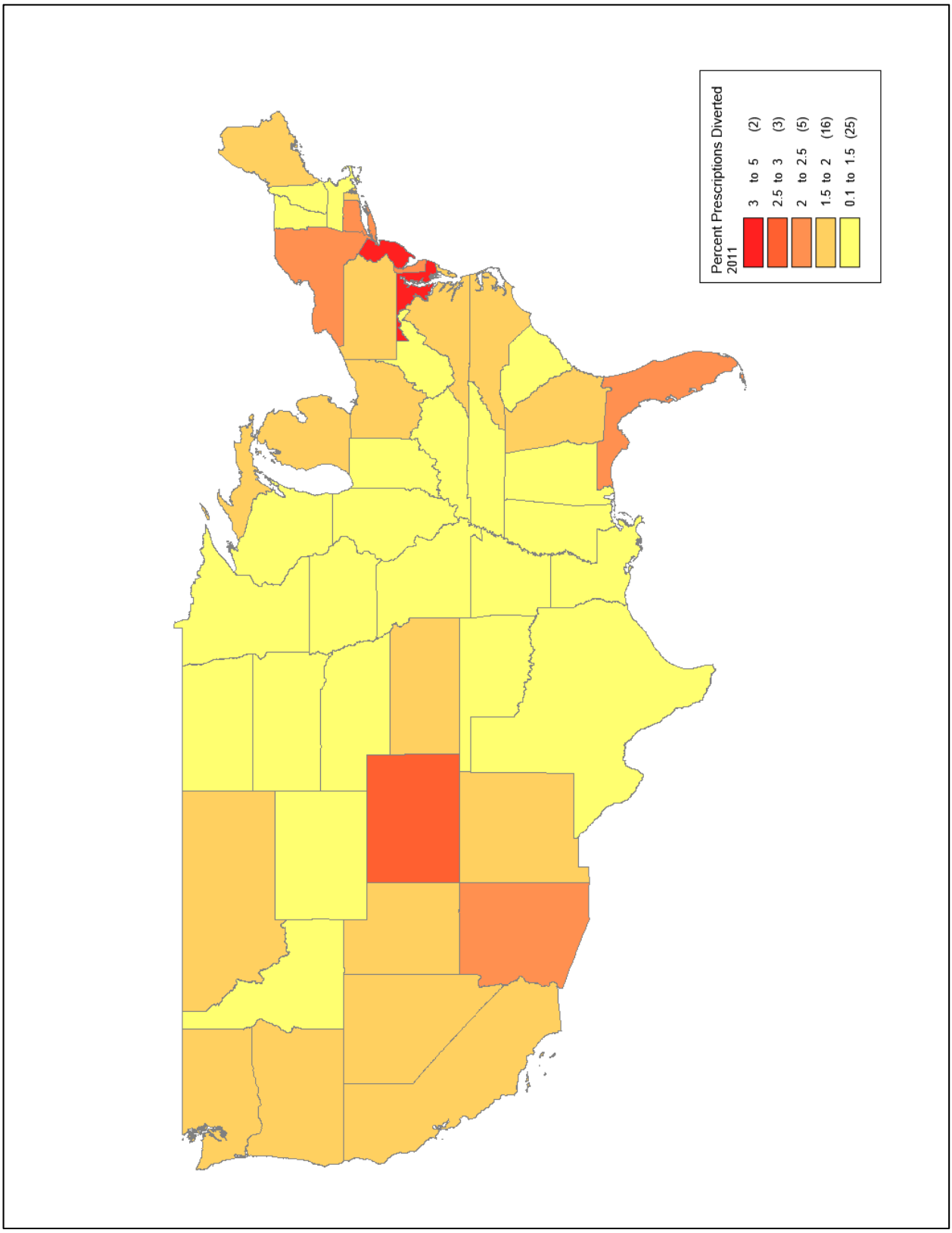
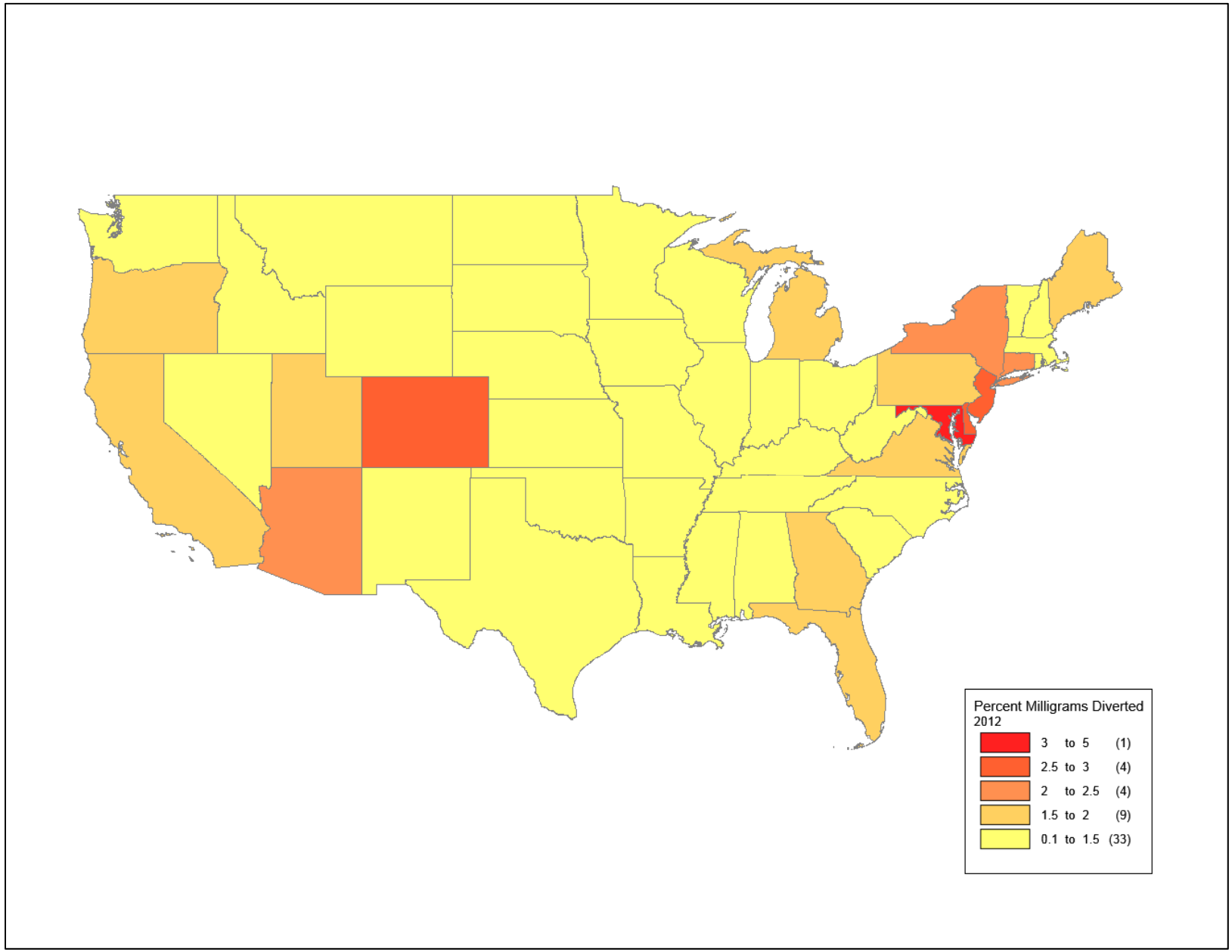


Figure J.5 Percent Milligrams Diverted by State: 2012



Appendix K

Percent Prescriptions Diverted by Zip-Three:

2008-2012

Figure K.1 Percent Prescriptions Diverted by Zip-Three: 2008

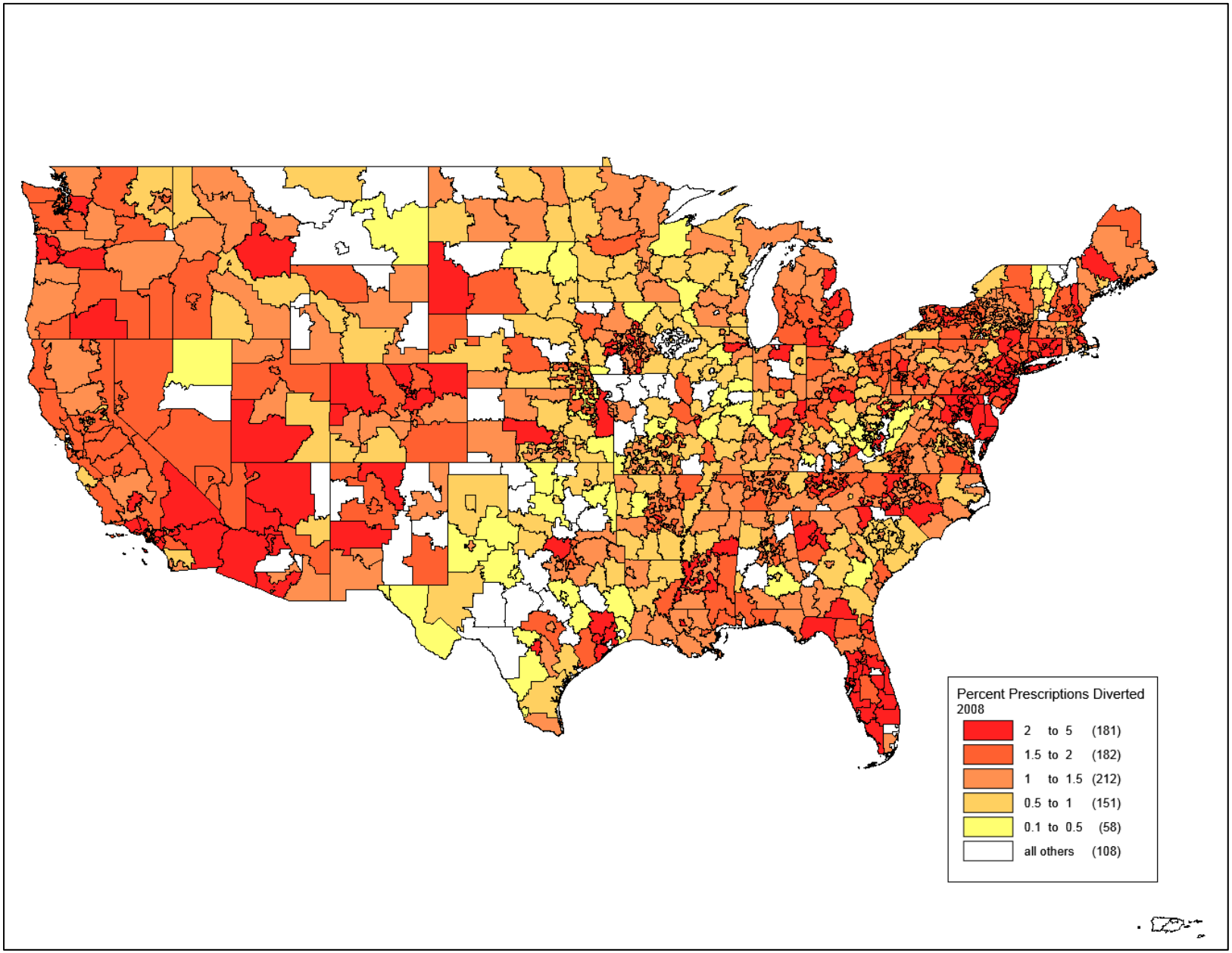


Figure K.2 Percent Prescriptions Diverted by Zip-Three: 2009

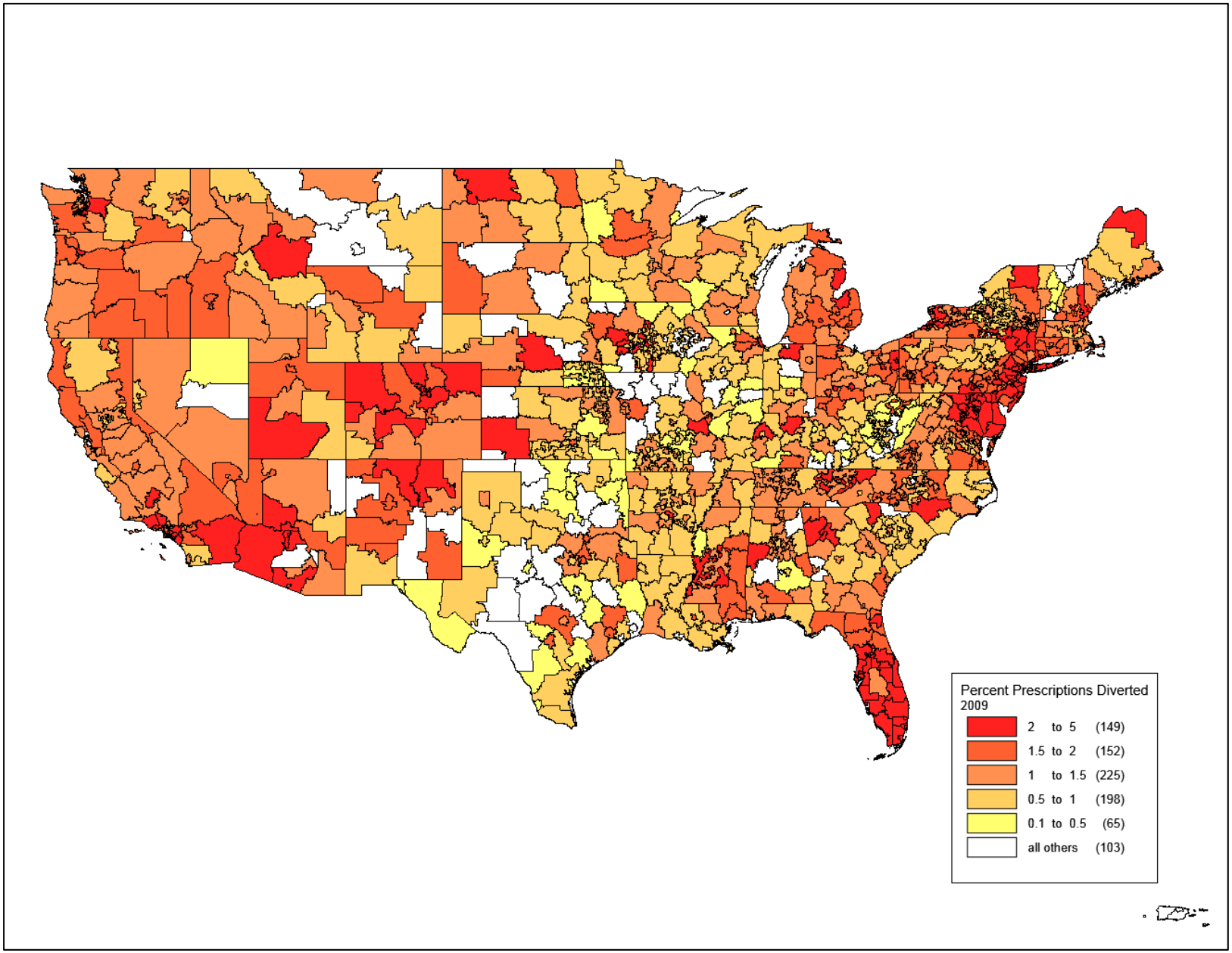


Figure K.3 Percent Prescriptions Diverted by Zip-Three: 2010

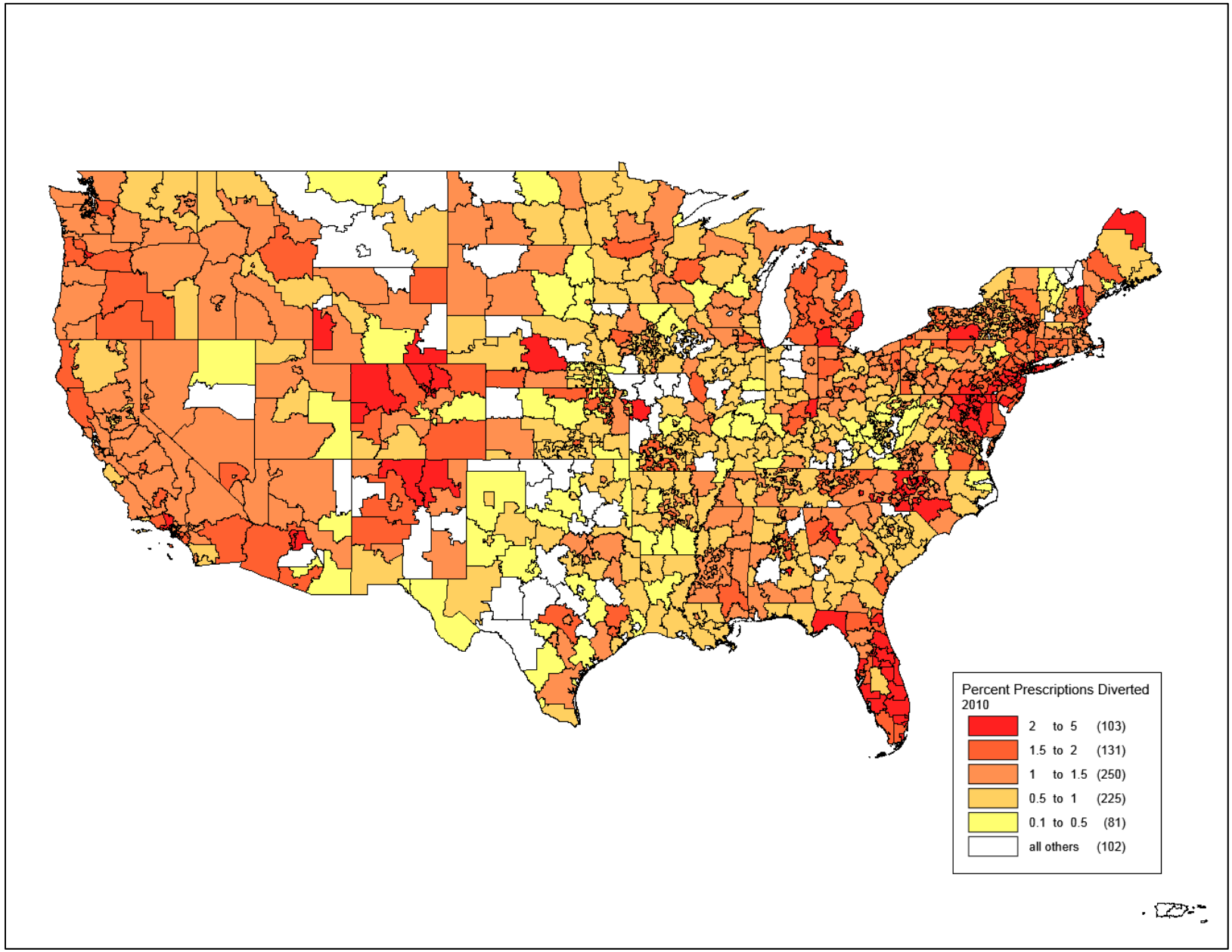


Figure K.4 Percent Prescriptions Diverted by Zip-Three: 2011

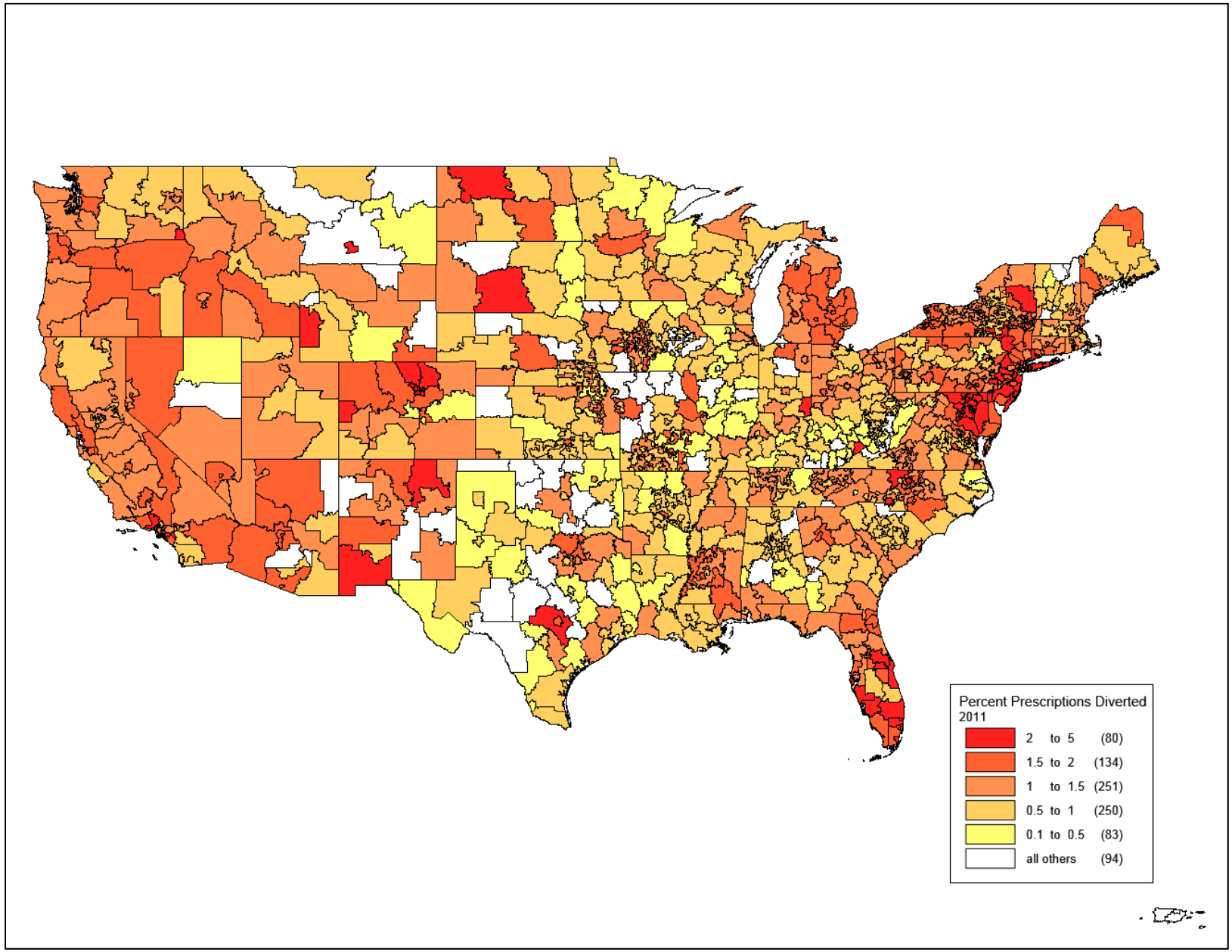
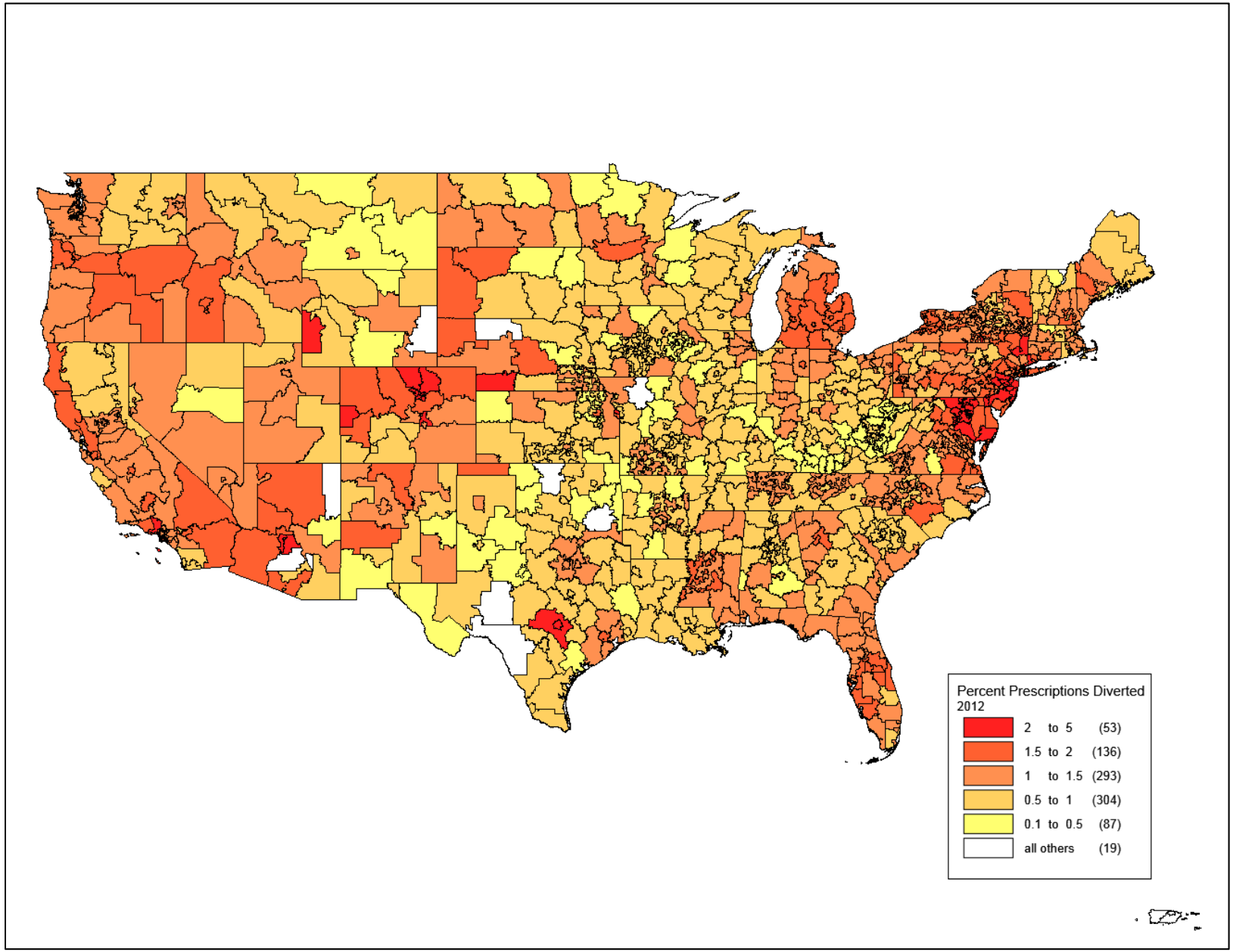


Figure K.5 Percent Prescriptions Diverted by Zip-Three: 2012



Appendix L

Percent Milligrams Diverted by Zip-Three:

2008-2012

Figure L.1 Percent Milligrams Diverted by Zip: 2008

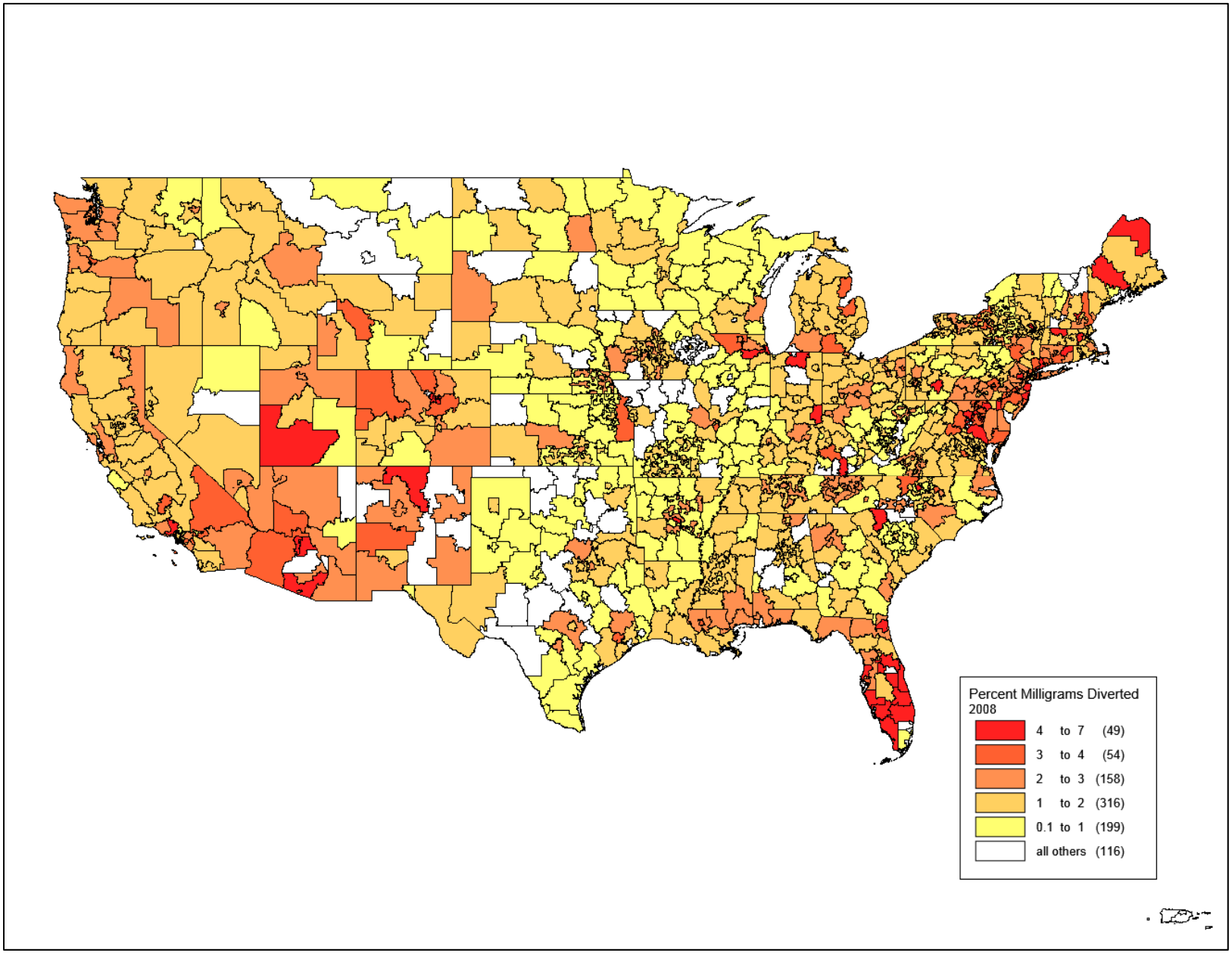


Figure L.2 Percent Milligrams Diverted by Zip: 2009

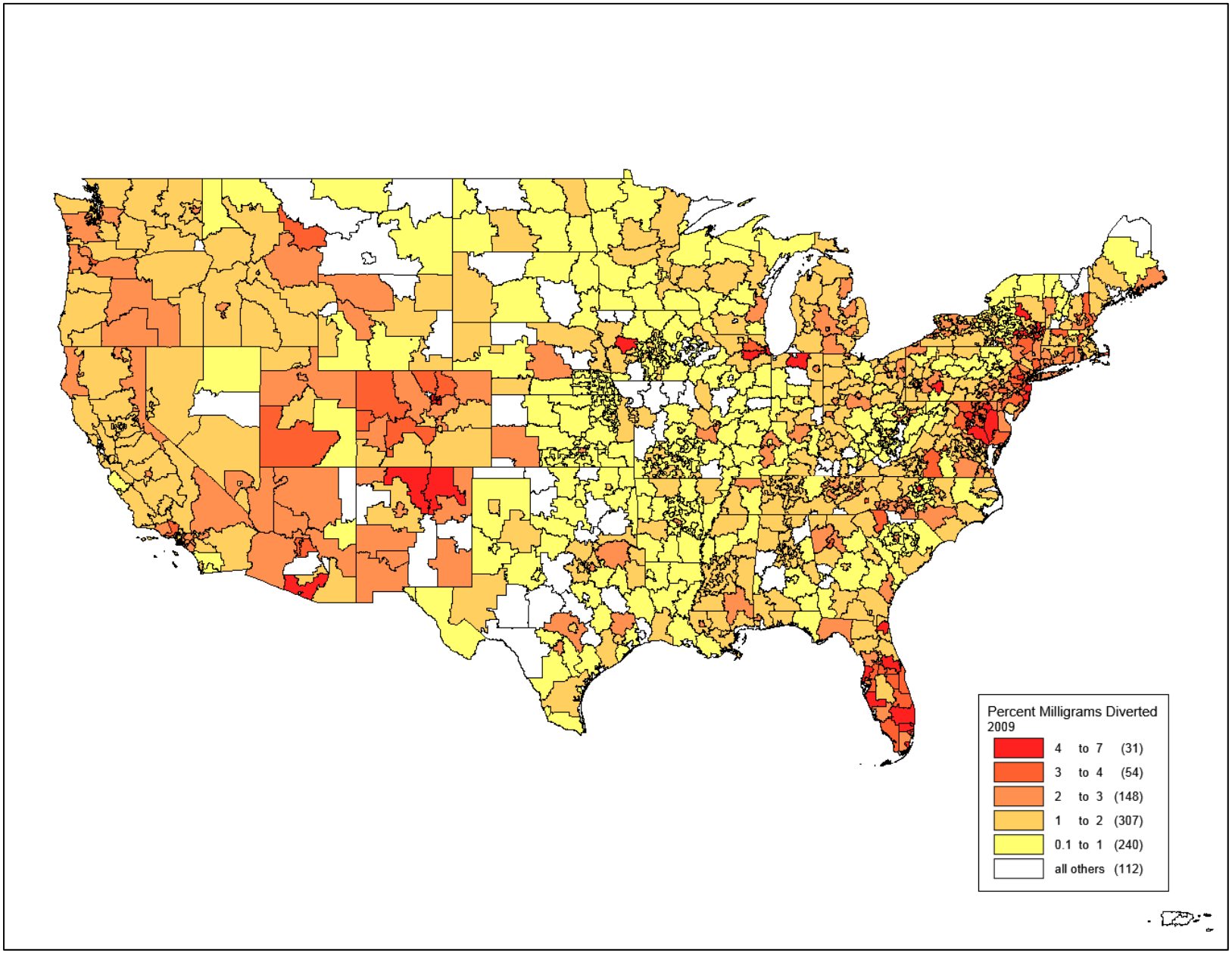


Figure L.3 Percent Milligrams Diverted by Zip: 2010

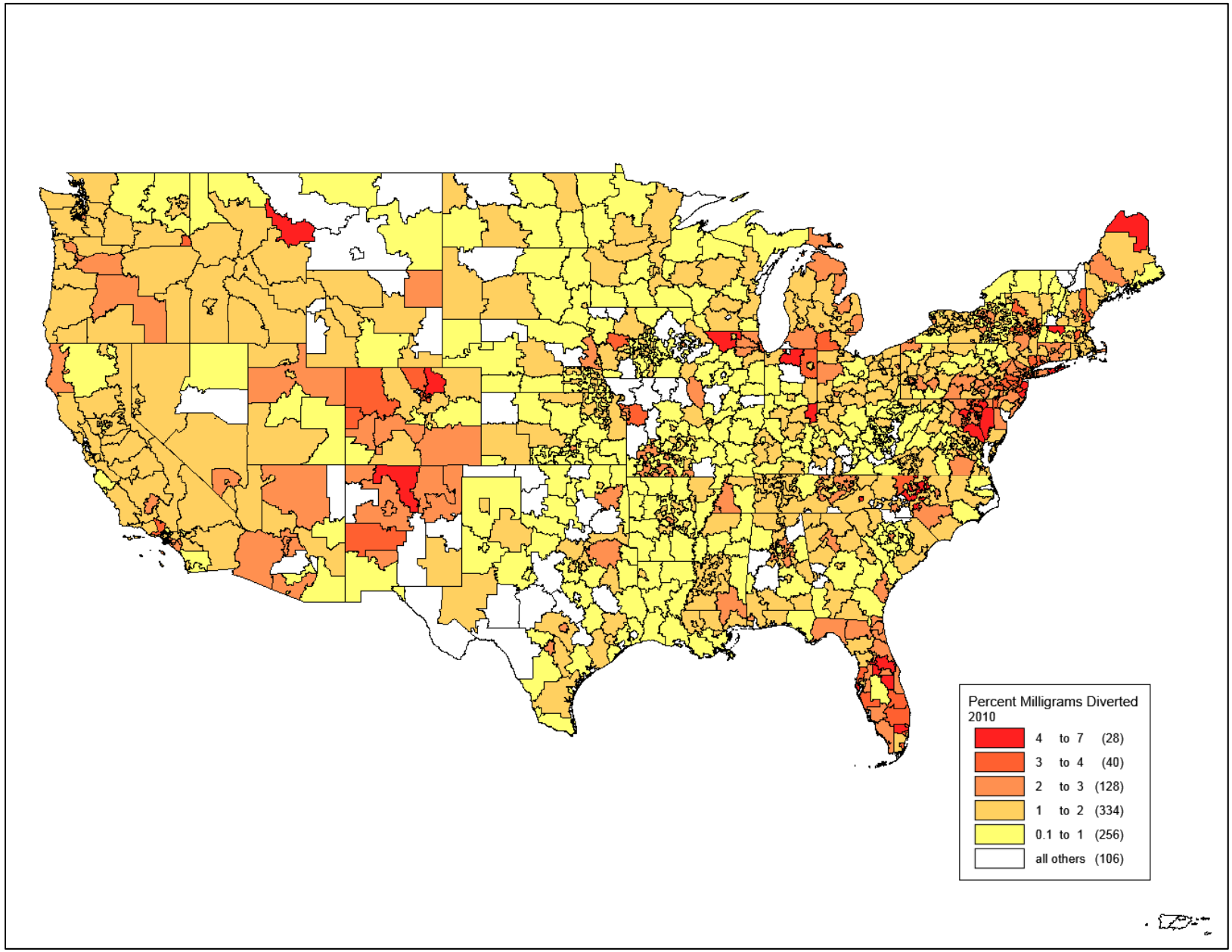


Figure L.4 Percent Milligrams Diverted by Zip: 2011

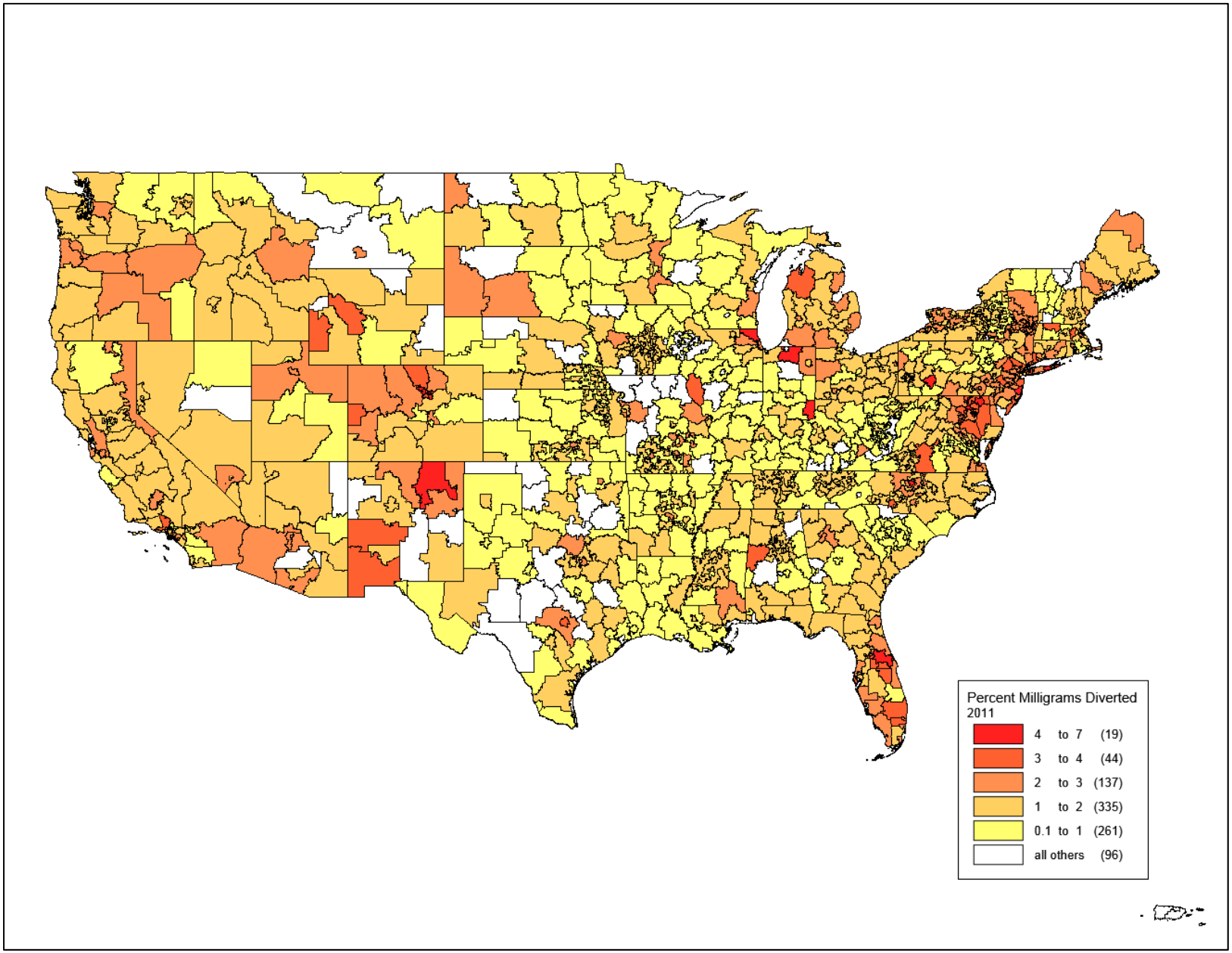


Figure L.5 Percent Milligrams Diverted by Zip: 2012