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Trends in Maine Prescription Monitoring Program (PMP) Data, 2006 – 2010

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Executive Summary

Introduction: The abuse of controlled prescription drugs is a serious public health problem in the United States. Prescribing and dispensing medications that pose a risk of health or psychological risk, addiction, or dependency are controlled by the U.S. Drug Enforcement Agency (DEA). Many commonly used medications, including narcotic pain relievers, tranquilizers, sedatives, and stimulants, are controlled by the DEA.

The Maine Prescription Monitoring Program (PMP) was developed to improve patient care and prevent prescription drug abuse and diversion. It tracks prescriptions filled for Maine residents for DEA Schedule II – IV medications. The PMP provides information to the Maine Office of Substance Abuse for surveillance and monitoring and to health care providers to help identify individuals who are misusing or overusing prescription drugs. Maine's PMP is one of 49 operational or pending PMPs in the United States.

Aim: We measured trends over time in the use of the medications tracked by the PMP, focusing on changes in use rates by characteristics of the patients and of the medications used.

Data and methods: This retrospective, observational study used de-identified person-level data obtained from the Maine PMP for state fiscal years (SFYs) 2006 through 2010. We also used estimates of the Maine population from the Census Bureau. The study population is Maine residents who filled a prescription for a study medication during the study period and for whom information on age and gender is in the PMP database.

Results

Pervasive use of PMP-tracked medications: In SFY 2010, over 2.4 million prescriptions for PMP-tracked medications were filled by Maine residents.

Increasing use of PMP medications: Almost every utilization measure studied showed increased use from 2006 to 2010:

- The percent of Maine's population with a prescription for the medications increased by 4.7%, to 31.1% in 2010.
- The number of prescriptions increased by 19.8%, to 2,421,011.
- The number of patients with a prescription increased by 5.1%, to 412,835. During this time, the estimated population of Maine increased by only 0.4%.
- The number of prescriptions per patient increased by 14.0%, to 5.9.

Dominance of pain relievers: Pain relievers continue to be the most frequently prescribed therapeutic class, constituting 48.0% of the prescriptions and 50.1% of the patients in 2010. This pattern may be changing, however. From 2008 to 2010, the number of prescriptions for pain relievers and the number of patients using them dropped, interrupting several years of increasing use. In contrast, these measures rose for the other classes studied.

Increasing use of Schedule II medications: Schedule II medications, which have the highest potential risk of addiction and dependency, had the largest increase in the number of prescriptions (up 26.2%) and patients (up 13.6%). Use of Schedule II medications was relatively high among patients younger than 24 years old. In 2010, 85.8% the medications used by children and 44.7% of the medications used by patients 18—24 were in Schedule II, compared to between 23.7% and 30.6% for the older age groups.

Source of payment: In 2010, the largest proportion --- 64.0% -- of the prescriptions was paid for by commercial insurance, which includes pharmacy benefit managers (PBMs). The second and third most frequently used payment sources were MaineCare (Maine Medicaid) (18.0%) and cash (9.6%). Cash payments by the elderly were up by 13.3%. In contrast, patients younger than 65 had decreased use of cash as a source of payment.

Implications: The findings highlight several areas of concern:

- *The growth in use of the PMP-tracked medications in Maine:* Continuing surveillance and initiatives are needed to alert the public and health care providers to the potential of addiction and dependency they pose.
- *Increased number of prescriptions per patient:* This may indicate closer monitoring (through shorter prescriptions) by providers, use of more different drugs and hence more complex treatment regimens, or patients' attempts to avoid monitoring by using multiple health care providers. Further study is needed to understand the factors underlying this increase.
- *Increased use of pain relievers by adults*
- *The rapid increase in prescriptions for Schedule II medications, especially for patients younger than 24*
- *Increasing use of cash by the elderly to pay for medications, which may indicate financial access problems or gaps in coverage under the Medicare Part D prescription drug benefit (the "doughnut hole").*

Conclusions: The findings suggest important areas for monitoring, public information initiatives, outreach to health care providers, and further study. While this study was conducted in a single state, there are 48 other operational or pending PMPs. We expect that the methods used and the issues noted will be relevant in other states.

Trends in Maine Prescription Monitoring Program (PMP) Data, 2006 – 2010

Introduction: The abuse of controlled prescription drugs is a serious public health problem in the United States (NIDA October 2011a). It has been called “....our Nation’s fastest-growing drug problem, with shocking consequences measured by overdose deaths, emergency room visits, treatment admissions, and increases in drug use” (Kerlikowske 2011). “Prescription drugs are the second-most abused category of drugs in the United States, following marijuana” (SAMHSA 2010).

Prescribing and dispensing medications that pose a risk of health or psychological risk, addiction, or dependency are controlled by the U.S. Drug Enforcement Agency (DEA). Many commonly used medications, including narcotic pain relievers, tranquilizers, sedatives, and stimulants, are controlled by the DEA (NIDA 2005, 2011b). Prescription opioid medications are of particular concern, since they are linked to high and increasing rates of nonmedical use, emergency department visits, costs of care, and deaths due to overdoses (CDC 2011; ONDCP undated; Jones 2012).

“Maine...remains among the worst states in the nation for pill abuse..... Almost 1,400 Maine people have died from pharmaceutical drug overdoses in the past decade and thousands more need treatment for addiction....Maine’s former U.S. attorney called prescription pain-pill abuse ‘the greatest criminal problem and possibly the greatest social problem facing Maine.’Substance abuse in Maine is now estimated to cost \$1.8 billion a year, or \$900 for every man, woman, and child, and much of that comes from misuse of prescription drugs” (Richardson 2011).

To circumvent surveillance and oversight, some patients attempt to obtain prescriptions for their own use or to sell from multiple prescribers or pharmacists, which is referred to as “doctor shopping” and “pharmacy hopping,” “potentially questionable activity,” or “multiple provider episodes (MPEs).” For the same reasons, patients with insurance coverage sometimes use cash to pay for controlled prescriptions (Rigg, March, and Inciardi 2010).

The Maine Prescription Monitoring Program (PMP), administered by the Maine Office of Substance Abuse (OSA), was developed to improve patient care and prevent prescription drug abuse (Maine DHHS 2009). Prescribers and pharmacists can access the PMP database for information on the PMP-tracked medications used by their patients and customers to help them identify individuals who may be misusing or overusing controlled prescription drugs. OSA also notifies prescribers and pharmacists about patients who make use of multiple providers to obtain PMP-tracked medications, in order to help reduce “doctor shopping” and facilitate the surveillance and monitoring of medication use. OSA makes the PMP data available to other State agencies seeking evidence regarding potentially inappropriate prescribing. Maine’s PMP is one of 49 operational or pending PMPs in the United States (DEA undated; Alliance of States with Prescription Monitoring Programs undated).

Aim: We measured trends over time in the use of the prescription drugs tracked by the Maine PMP. This report focuses on characteristics of the patients and the medications they used. It updates an earlier report by the authors, also commissioned by OSA, which reported on PMP data for 2005 through 2008 (Payne and Thayer 2009).

Data and methods: This is a retrospective, observational study using de-identified person-level data obtained from the Maine PMP for state fiscal years (SFYs) 2006 through 2010. The PMP data base includes information from all pharmacies (except Veterans Administration pharmacies) for all prescriptions filled for Maine residents for DEA Schedule II – IV medications. Schedule II medications have the highest potential risk of addiction and dependency and Schedule IV the lowest risk. The medications tracked include narcotic pain relievers, tranquilizers, sedatives, stimulants, hormone replacements, and miscellaneous other drugs. We also used estimates of the Maine population from the Census Bureau (U.S. Census Bureau 2011). The study population is Maine residents who filled a prescription for one of the study medications during the study period and for whom information on age and gender is included in the PMP database.

We analyzed trends by patient age, gender, and urban/rural residence (WWAMI Rural Health Research Center 2006), and by the medication therapeutic class, schedule, and source of payment. We calculated use rates for each year studied. The trends were fairly uniform over time and there were few abrupt changes within the study period. Therefore, for the sake of simplicity, we focus on 2006 and 2010 in the report. Information for each of the five study years is presented in the Appendix and discussed in the report when noteworthy.

Results

Use rates: In SFY 2010, 31.1% of Maine’s population had a prescription for one or more of the PMP-tracked medications, a 4.7% increase from 2006 (Table 1). More than 2.4 million prescriptions for the PMP-tracked medications were dispensed (Table 2).

Almost all the utilization measures we studied increased from 2006 to 2010 (Table 2):

- The number of prescriptions increased by 19.8%, to 2,421,011.
- The number of patients with a prescription increased by 5.1%, to 412,835. During this time, the estimated population of Maine increased by only 0.4% (U.S. Census Bureau).
- The number of prescriptions per patient increased by 14.0%, to 5.9.

Age: People age 45-64 were the largest age group in terms of patients (36.0% of the total in 2010) (Table 2). They were somewhat over-represented in the patient population, since they were only 30.9% of the estimated population (Table 1). This age group also had the most prescriptions (40.2% of the total) and the highest number of prescriptions per patient (6.5) in 2010.

Children (age 0 – 17) were 6.7% of the total patients (Table 2). They were under-represented in the patient population, since they constituted 20.7% of the estimated state population in 2010 (Table 1). While the number of the total Maine population who were children *decreased* by 4.8% from 2006 to 2010, the percent of children who were using a PMP-tracked medication (that is, the per capita rate) *increased* by 5.2%% (Table 1).

People age 65 and older were over-represented in the patient population. They were 21.7% of the patients in 2010 but 15.9% of the state population.

Non-elderly patients (aged 0 – 64) had increases of 14% or more in the number of prescriptions per patient from 2006 to 2010. The elderly (age 65 and older) had an increase of only 1.7% in this measure, but this was from a relatively high base rate of 5.5.

Rural/urban residence: The urban core areas and small town/rural areas each had about 33% of the prescriptions and the patients in the study years (Table 3). Suburban areas had the smallest percentage of prescriptions and patients (15.5% and 16.5%, respectively, in 2010), but they experienced the greatest growth in these measures, with increases of 27.1% in the number of prescriptions and 11.6% in the number of patients. In general, however, there were few noteworthy changes in the use rates among the residential areas.

Therapeutic class: Before discussing the characteristics of the medications used, we note that in the following sections a patient is counted once for each therapeutic class, Schedule, or payer category in which he or she had a prescription, so it is important to keep in mind that the patient counts do not represent unique individuals in the following tables. We have therefore not calculated the average number of prescriptions per patient in Tables 4 – 9.

Pain relievers continue to be the most frequently prescribed therapeutic class, constituting 48.0% of the prescriptions and 50.1% of the patients in 2010 (Table 4). The dominance of pain relievers may be decreasing slightly, however. From 2006 to 2010, the number of prescriptions for pain relievers (up 7.5%) and the number of patients using them (up 1.1%) did increase, but the increases were less than for all the medications combined (up 19.8% and 16.7%, respectively). In addition, starting in 2008, the numbers of prescriptions for pain relievers and of patients using them dropped, breaking several years of increases (Table 3A). In contrast, these numbers increased for each of the other categories studied.

Tranquilizers were second most frequently used therapeutic class, with 27.2% of the prescriptions and 25.8% of the patients in 2010.

Among the most frequently used therapeutic classes, sedatives and stimulants had the greatest rates of increase in terms of the number of prescriptions (increases of 50.2% and 40.7%, respectively) and the numbers of patients with prescriptions (increases of 24.6% and 29.6%). (There were also very large percentage increases in the use of hormone replacement medications, but this reflected the very small number of prescriptions for these medications in

2006. The numbers of prescriptions for these medications and the number of people using them remained relatively small in 2010.)

About one-third (34.2%) of the patients had prescriptions for more than one therapeutic class.

There are distinct differences in the therapeutic classes used by age group (Table 5). For example, in 2010

- Children (aged 0 – 17) most commonly used stimulants (80.9% of their prescriptions), which are often used to treat attention deficit disorder and hyperactivity.
- Adults (age 18 and older) most commonly used pain relievers, which constituted about half the prescriptions for each adult age group.
- There were large percentage increases in the use of sedatives and stimulants by adult patients (age 18 and older).

Schedule: Schedule II drugs warrant special attention because they are considered by the U.S. DEA to have the highest potential risk for abuse and dependency. From 2006 to 2010, Schedule II medications showed the greatest increase in the number of prescriptions (up by 26.2%) and the number of patients (up 13.6%) (Table 6).

The largest percentage of prescriptions filled in 2010 (39.4%) was for Class IV drugs, which are considered to have the least potential for abuse and dependency. The largest percentage of patients (38.8%) used Class III drugs.

One third (34.5%) of the patients had prescriptions for more than one Schedule.

For each of the age groups under age 65, the number of prescriptions increased the most for Schedule II medications (Table 7).

The use of Schedule II medications was relatively high among patients younger than 24 years old. For example, in 2010, 85.8% the medications used by children and 44.7% of the medications used by patients 18–24 were in Schedule II, compared to between 23.7% and 30.6% for the older age groups.

Payer: Before discussing the results by payer, it is important to note that they are problematic because of the relatively large percent of prescriptions with an “unknown” source of payment in 2010 (4.2%) compared to 2006 (0.1%) (Table 8).

In 2010, the largest proportion --- 64.0% -- of the prescriptions was paid for by commercial insurance, which includes pharmacy benefit managers (PBMs). The second and third most frequently used payment sources were MaineCare (Maine Medicaid) (18.0%) and cash (9.6%).

From 2006 to 2010, there were decreases in the percentage of prescriptions paid for by cash (down by 8.0%), MaineCare (down 4.6%), and Medicare (down 5.6%)(although the number of prescriptions paid for by Medicare was relatively small in each year and was only 3.3% of the total in 2010) (Table 8).

Patients age 65 and older experienced the biggest shifts in sources of payment from 2006 to 2010 (Table 9). Cash payments by the elderly were up by 13.3% and they had the second highest increase in payments by commercial insurance (up by 26.7%) (Table 9). The elderly also had large decreases in payment by MaineCare (down 71.2%) and by Medicare (down by 42.2%, but from relatively small numbers of prescriptions in 2006).

There were relatively large increases in the percentages of prescriptions paid for by Medicare for patients age 25-44 (up by 60.5%) and 45-64 (up by 69.6%), although for both age groups the numbers of prescriptions in 2006 were very small.

One quarter (24.1%) of the patients had more than one source of payment for their PMP medications in 2010.

Summary of key findings and their implications

The growth in use of the PMP-tracked medications in Maine, as indicated by increases in almost every utilization measure studied: While the medications tracked by the PMP can contribute to effective treatment when used appropriately and under medical supervision, the increases noted point to the continued need for tracking medication use patterns and for alerting the public and health care providers to the potential of addiction and dependency they pose.

The growth in the number of prescriptions per patient: This increase may or may not be a cause of concern. It may indicate a potential problem if due to the use of more different drugs by patients, which can make medical monitoring more complex, or to more “doctor shopping” or “pharmacy hopping” to avoid monitoring or limits on the PMP drugs. Or, it may indicate improved monitoring by prescribers, who sometimes write prescriptions for shorter periods of time to allow for more frequent contact with the patients to manage their care. Further study, using information on days supply and medication quantities prescribed, is needed to understand the factors underlying this trend and the implications for quality and surveillance.

The increased use of pain relievers by adult patients: Prescription opioid medications are of particular concern, since they are linked to high and increasing rates of nonmedical use, health care utilization, and deaths due to overdoses.

The rapid growth in the Schedule II medications and the relatively high use of Schedule II medications among patients younger than 24 years old: As noted earlier, Schedule II medications are of concern because they have the highest potential for dependency and risk.

The increasing reliance on cash payments by the elderly: The Medicare Part D prescription drug benefit, introduced in January, 2006, funneled payments for seniors' prescriptions through Pharmacy Benefit Managers (PBMs), which are classified here as commercial insurance. Part D also added drug coverage for many Medicare beneficiaries who previously did not have such coverage and shifted medication coverage for dual eligibles from Medicaid and Medicare to PBMs. The increasing reliance on cash payments by the elderly may indicate continued financial access problems due to their inability to take advantage of Part D or to gaps in coverage under the Medicare Part D prescription drug benefit (the "doughnut hole").

The increasing use of Medicare as a source of payment for patients age 25-64: This is most likely due to increases in disability under Medicare, which may be a reflection of the economic recession and difficulty in obtaining paying jobs.

Strengths and limitations of the study: The PMP database is noteworthy because it includes prescriptions for many commonly used medications which pose potential harm for patients and society. It includes data from all payers, which is especially important for tracking person-level medication use. It includes information on cash payments, which can flag access problems such as lack of insurance coverage or attempts to circumvent payers' monitoring and surveillance policies. The PMP data are timely and allow for tracking person-level and population-level medication use over time.

The study was conducted for policy makers and program managers in Maine. The generalizability of the findings may be limited by the focus on a single state. Maine's population is older, less diverse racially and more rural, and has lower per capita income and higher per capita health care expenditures than the national average, which may limit the generalizability of the results to other states (Kaiser Family Foundation 2007). The data from 2010 are limited by the large number of prescriptions with unknown payer.

Conclusions: While the PMP data have some limitations, their timeliness and availability compensate for these limitations. The accuracy of the data is sufficient for drawing conclusions about population groups and subgroups and identifying trends and population groups for continued monitoring and public health initiatives. The findings suggest important areas for monitoring, public information initiatives, outreach to health care providers, and further study. While this study was conducted in a single state, 48 other states have operational or pending PMPs. We expect that the methods used and the issues noted will be relevant in other states.

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Table 1. Per capita medication use by age, Maine PMP data, 2006 and 2010

Age	Number and percent of population			Number of prescriptions per 100 persons ¹			Percent of population with a prescription ¹		
	2006	2010	Percent change	2006	2010	Percent change	2006	2010	Percent change
0 to 17	288,500 21.8%	274,568 20.7%	-4.8%	44.8	53.9	20.3%	9.5%	10.0%	5.2%
18 to 24	117,084 8.8%	116,094 8.7%	-0.8%	93.7	108.1	15.3%	29.1%	29.4%	1.0%
25 to 44	337,839 25.5%	316,064 23.8%	-6.4%	165.5	213.9	29.2%	33.4%	35.7%	6.7%
45 to 64	385,583 29.1%	410,830 30.9%	6.5%	198.2	236.8	19.5%	34.9%	36.2%	3.9%
65+	194,613 14.7%	211,160 15.9%	8.5%	235.9	236.1	0.1%	43.2%	42.5%	-1.6%
Total	1,323,619 100.0%	1,328,716 100.0%	0.4%	152.7	182.2	19.3%	29.7%	31.1%	4.7%

¹ The population counts and the number of persons are the estimated population count as of July 1 of each year. The numbers of prescriptions and patients are from Table 2.

Source: Table 2. Intercensal Estimates of the Resident Population by Sex and Age for Maine: April 1, 2000 to July 1, 2012 (ST-WST00INT-02-23), from the U.S. Census Bureau, Population Division, Release Date: September 2011, and Muskie School of Public Service analysis of Maine PMP data

Table 2. Medication use by age group, Maine PMP data, 2006 and 2010

Age	Number and percent of prescriptions			Number and percent of patients			Number of prescriptions per patient		
	2006	2010	Percent change	2006	2010	Percent change	2006	2010	Percent change
0 to 17	129,185 6.4%	147,905 6.1%	14.5%	27,539 7.0%	27,580 6.7%	0.1%	4.7	5.4	14.3%
18 to 24	109,729 5.4%	125,486 5.2%	14.4%	34,042 8.7%	34,094 8.3%	0.2%	3.2	3.7	14.2%
25 to 44	559,254 27.7%	676,184 27.9%	20.9%	113,007 28.8%	112,762 27.3%	-0.2%	4.9	6.0	21.2%
45 to 64	764,320 37.8%	972,850 40.2%	27.3%	134,376 34.2%	148,694 36.0%	10.7%	5.7	6.5	15.0%
65+	459,172 22.7%	498,586 20.6%	8.6%	84,011 21.4%	89,705 21.7%	6.8%	5.5	5.6	1.7%
Total	2,021,660 100.0%	2,421,011 100.0%	19.8%	392,975 100.0%	412,835 100.0%	5.1%	5.1	5.9	14.0%

Source: Muskie School of Public Service analysis of Maine PMP data

Table 3. Medication use by patient residence, Maine PMP data, 2006 and 2010

Patient residence ¹	Number and percent of prescriptions			Number and percent of patients			Number of prescriptions per patient		
	2006	2010	Percent change	2006	2010	Percent change	2006	2010	Percent change
Urban core ²	649,675 32.1%	782,921 32.3%	20.5%	127,004 32.3%	133,817 32.4%	5.4%	5.1	5.9	14.4%
Suburban	295,983 14.6%	376,324 15.5%	27.1%	61,029 15.5%	68,116 16.5%	11.6%	4.8	5.5	13.9%
Large town ³	380,811 18.8%	462,650 19.1%	21.5%	73,725 18.8%	77,657 18.8%	5.3%	5.2	6.0	15.3%
Small town and rural	679,634 33.6%	796,802 32.9%	17.2%	127,576 32.5%	132,599 32.1%	3.9%	5.3	6.0	12.8%
Missing	15,557 0.8%	2,314 0.1%	-85.1%	3,641 0.9%	646 0.2%	-82.3%	4.3	3.6	-16.2%
Total	2,021,660 100.0%	2,421,011 100.0%	19.8%	392,975 100.0%	412,835 100.0%	5.1%	5.1	5.9	14.0%

¹ Rural-urban commuting area (WWAMI Rural Health Research Center, 2006)

² Examples: Auburn, Bangor, Biddeford, Cape Elizabeth, Falmouth, Freeport, Gorham, Kittery, Kittery Point, Lewiston, Portland, Scarborough, South Freeport, Westbrook, Windham, and Yarmouth

³ Examples: Acton, Albion, Gardiner, Georgetown, Hallowell, Harpswell, and Mount Vernon

Source: Muskie School of Public Service analysis of Maine PMP data

Table 4. Medication use by therapeutic class, Maine PMP data, 2006 and 2010

Therapeutic class	Number and percent of prescriptions			Number and percent of patients ¹			Number of prescriptions per patient ²		
	2006	2010	Percent change	2006	2010	Percent change	2006	2010	Percent change
Pain reliever	1,081,921 53.5%	1,163,265 48.0%	7.5%	274,782 57.8%	277,691 50.1%	1.1%	3.9	4.2	6.4%
Sedative	139,686 6.9%	209,794 8.7%	50.2%	40,853 8.6%	50,910 9.2%	24.6%	3.4	4.1	20.5%
Stimulant	203,879 10.1%	286,955 11.9%	40.7%	31,317 6.6%	40,598 7.3%	29.6%	6.5	7.1	8.6%
Tranquilizer	556,033 27.5%	658,630 27.2%	18.5%	128,113 27.0%	142,915 25.8%	11.6%	4.3	4.6	6.2%
Hormone replacement	8,703 0.4%	15,817 0.7%	81.7%	2,660 0.6%	4,606 0.8%	73.2%	3.3	3.4	5.0%
Other	31,438 1.6%	86,550 3.6%	175.3%	21,114 4.4%	37,454 6.8%	77.4%	1.5	2.3	55.2%
Total	2,021,660 100.0%	2,421,011 100.0%	19.8%	475,065 100.0%	554,174 100.0%	16.7%	N/A ²	N/A	N/A

¹ The total number of patients in this table is greater than the total in Table 1 because patients are counted once for each therapeutic class in which they had prescriptions.

² The total average number of all prescriptions per patient is not applicable because some patients were counted more than once.

Source: Muskie School of Public Service analysis of Maine PMP data

Table 5. Medication use by therapeutic class and age, Maine PMP data, 2006 and 2010

Therapeutic class	Percent of all prescriptions and percent change 2006 - 2010											
	0 to 17		18 to 24		25 to 44		45 to 64		65+		Total	
	% in 2010	% change	% in 2010	% change	% in 2010	% change	% in 2010	% change	% in 2010	% change	% in 2010	% change
Pain reliever	8.4%	-11.9%	46.0%	-7.7%	52.1%	5.3%	51.2%	16.9%	48.8%	-0.7%	48.0%	7.5%
Sedative	3.1%	15.4%	2.8%	50.2%	6.1%	69.0%	9.9%	61.1%	12.8%	30.2%	8.7%	50.2%
Stimulant	80.9%	14.8%	31.1%	47.9%	11.3%	100.5%	4.7%	52.8%	1.1%	14.3%	11.9%	40.7%
Tranquilizer	3.7%	14.3%	15.1%	10.8%	26.8%	18.8%	29.5%	24.7%	33.4%	9.7%	27.2%	18.5%
Hormone replacement	0.1%	-13.2%	0.2%	18.8%	0.4%	62.8%	1.0%	87.6%	0.6%	98.5%	0.7%	81.7%
Other	3.9%	181.9%	4.9%	382.7%	3.3%	183.1%	3.7%	174.4%	3.4%	130.7%	3.6%	175.3%
Total	147,905 100.0%	14.5%	125,486 100.0%	14.4%	676,184 100.0%	20.9%	972,850 100.0%	27.3%	498,586 100.0%	8.6%	2,421,011 100.0%	19.8%

Source: Muskie School of Public Service analysis of Maine PMP data

Table 6. Medication use by schedule, Maine PMP data, 2006 and 2010

Schedule ¹	Number and percent of prescriptions			Number and percent of patients ²			Number of prescriptions per patient ³		
	2006	2010	Percent change	2006	2010	Percent change	2006	2010	Percent change
Schedule II	634,970 31.4%	801,319 33.1%	26.2%	128,268 24.6%	145,680 26.2%	13.6%	5.0	5.5	11.1%
Schedule III	570,459 28.2%	666,613 27.5%	16.9%	209,006 40.1%	215,484 38.8%	3.1%	2.7	3.1	13.3%
Schedule IV	816,231 40.4%	953,079 39.4%	16.8%	183,997 35.3%	194,159 35.0%	5.5%	4.4	4.9	10.7%
Total	2,021,660 100.0%	2,421,011 100.0%	19.8%	521,271 100.0%	555,323 100.0%	6.5%	N/A	N/A	N/A

¹ Schedules are established by the U.S. Drug Enforcement Agency (DEA).

² The total number of patients in this table is greater than the total in Table 1 because patients are counted once for each schedule in which they had prescriptions.

³ The average number of all prescriptions per patient is not applicable because some patients were counted more than once.

Source: Muskie School of Public Service analysis of Maine PMP data

Table 7. Medication use by schedule and age, Maine PMP data, 2006 and 2010.

Schedule	Percent of prescriptions and percent change 2006 - 2010											
	0 to 17		18 to 24		25 to 44		45 to 64		65+		Total	
	% in 2010	% change	% in 2010	% change	% in 2010	% change	% in 2010	% change	% in 2010	% change	% in 2010	% change
Schedule II	85.8%	18.8%	44.7%	35.1%	30.6%	29.4%	30.1%	35.5%	23.7%	7.2%	33.1%	26.2%
Schedule III	7.2%	-17.5%	36.1%	-0.8%	34.2%	16.6%	26.9%	23.1%	23.7%	16.5%	27.5%	16.9%
Schedule IV	7.0%	9.5%	19.2%	7.0%	35.2%	18.4%	43.0%	24.6%	52.6%	5.9%	39.4%	16.8%
Total	147,905		125,486		676,184		972,850		498,586		2,421,011	
	100.0%	14.5%	100.0%	14.4%	100.0%	20.9%	100.0%	27.3%	100.0%	8.6%	0.0%	19.8%

Source: Muskie School of Public Service analysis of Maine PMP data

Table 8. Medication use by source of payment, Maine PMP data, 2006 and 2010

Source of payment	Number and percent of prescriptions			Number and percent of patients ¹			Number of prescriptions per patient ²		
	2006	2010	Percent change	2006	2010	Percent change	2006	2010	Percent change
Cash	252,186 12.5%	231,924 9.6%	-8.0%	87,533 18.8%	78,237 15.3%	-10.6%	2.9	3.0	2.9%
Medicaid	457,695 22.6%	436,833 18.0%	-4.6%	75,315 16.2%	65,097 12.7%	-13.6%	6.1	6.7	10.4%
Medicare	83,648 4.1%	78,954 3.3%	-5.6%	16,823 3.6%	13,275 2.6%	-21.1%	5.0	5.9	19.6%
Commercial insurance	1,216,169 60.2%	1,548,970 64.0%	27.4%	284,109 61.0%	308,142 60.1%	8.5%	4.3	5.0	17.4%
Other ³	9,053 0.4%	23,438 1.0%	158.9%	1,807 0.4%	7,385 1.4%	308.7%	5.0	3.2	-36.5%
Unknown	2,909 0.1%	100,892 4.2%	3368.3%	515 0.1%	40,217 7.8%	7709.1%	5.6	2.5	-55.6%
Total	2,021,660 100.0%	2,421,011 100.0%	19.8%	466,102 100.0%	512,353 100.0%	9.9%	N/A	N/A	N/A

¹ The total number of patients in this table is greater than the total in Table 1 because patients are counted once for each payment type in which they had prescriptions.

² The average number of all prescriptions per patient is not applicable because some patients were counted more than once.

³ Includes Indian nation, military, and worker compensation.

Source: Muskie School of Public Service analysis of Maine PMP data

Table 9. Medication use by source of payment and age, Maine PMP data, 2006 and 2010

Source of payment	Percent of prescriptions and percent change 2006 - 2010											
	0 to 17		18 to 24		25 to 44		45 to 64		65+		Total	
	% in 2010	% change	% in 2010	% change	% in 2010	% change	% in 2010	% change	% in 2010	% change	% in 2010	% change
Cash	4.4%	-14.9%	9.8%	-27.1%	9.2%	-19.7%	7.7%	-9.6%	15.1%	13.3%	9.6%	-8.0%
Medicaid	40.6%	27.6%	32.7%	12.9%	29.3%	13.5%	12.3%	-12.8%	3.6%	-71.2%	18.0%	-4.6%
Medicare	0.1%	-89.9%	0.3%	-49.4%	2.1%	60.5%	3.4%	69.6%	6.1%	-42.2%	3.3%	-5.6%
Commercial insurance	50.0%	1.0%	52.5%	19.2%	54.3%	25.0%	71.1%	33.7%	70.2%	26.7%	64.0%	27.4%
Other¹	0.5%	33200.0%	0.6%	171.6%	0.9%	74.5%	1.2%	139.3%	0.8%	1162.8%	1.0%	158.9%
Unknown	4.4%	34400.0%	4.1%	5524.2%	4.2%	3308.6%	4.2%	2884.7%	4.1%	3239.1%	4.2%	3368.3%
Total	147,905		125,486		676,184		972,850		498,586		2,421,011	
	100.0%	14.5%	100.0%	14.4%	100.0%	20.9%	100.0%	27.3%	100.0%	8.6%	100.0%	19.8%

¹ Includes Indian nation, military, and worker compensation.

Source: Muskie School of Public Service analysis of Maine PMP data

Appendix. Results for each year studied, 2006 through 2010

Table 1A. Medication use by age group, Maine PMP data, 2006-2010

Age	Number and percent of prescriptions						Number and percent of patients						Number of prescriptions per patient					
	2006	2007	2008	2009	2010	Percent change 2006-2010	2006	2007	2008	2009	2010	Percent change 2006-2010	2006	2007	2008	2009	2010	Percent change 2006-2010
0 to 17	129,185 6.4%	133,669 6.2%	140,982 6.1%	140,649 6.0%	147,905 6.1%	14.5%	27,539 7.0%	27,520 6.9%	27,359 6.6%	27,361 6.6%	27,580 6.7%	0.1%	4.7	4.9	5.2	5.1	5.4	14.3%
18 to 24	109,729 5.4%	113,533 5.3%	120,742 5.2%	122,747 5.2%	125,486 5.2%	14.4%	34,042 8.7%	34,033 8.5%	34,941 8.4%	34,561 8.3%	34,094 8.3%	0.2%	3.2	3.3	3.5	3.6	3.7	14.2%
25 to 44	559,254 27.7%	587,283 27.4%	630,906 27.2%	639,908 27.3%	676,184 27.9%	20.9%	113,007 28.8%	113,531 28.3%	114,820 27.7%	113,357 27.3%	112,762 27.3%	-0.2%	4.9	5.2	5.5	5.6	6.0	21.2%
45 to 64	764,320 37.8%	828,889 38.7%	909,071 39.1%	934,327 39.8%	972,850 40.2%	27.3%	134,376 34.2%	139,739 34.9%	146,374 35.4%	148,563 35.8%	148,694 36.0%	10.7%	5.7	5.9	6.2	6.3	6.5	15.0%
65+	459,172 22.7%	480,032 22.4%	520,689 22.4%	508,806 21.7%	498,586 20.6%	8.6%	84,011 21.4%	85,914 21.4%	90,274 21.8%	91,113 22.0%	89,705 21.7%	6.8%	5.5	5.6	5.8	5.6	5.6	1.7%
Total	2,021,660 100.0%	2,143,406 100.0%	2,322,390 100.0%	2,346,437 100.0%	2,421,011 100.0%	19.8%	392,975 100.0%	400,737 100.0%	413,768 100.0%	414,955 100.0%	412,835 100.0%	5.1%	5.1	5.3	5.6	5.7	5.9	14.0%

Source: Muskie School of Public Service analysis of Maine PMP data

Table 2A. Medication use by patient residence, Maine PMP data, 2006-2010

Patient residence ¹	Number and percent of prescriptions						Number and percent of patients						Number of prescriptions per patient					
	2006	2007	2008	2009	2010	Percent change 2006-2010	2006	2007	2008	2009	2010	Percent change 2006-2010	2006	2007	2008	2009	2010	Percent change 2006-2010
Urban core ²	649,675 32.1%	689,833 32.2%	758,064 32.6%	764,606 32.6%	782,921 32.3%	20.5%	127,004 32.3%	129,876 32.4%	134,724 32.6%	134,254 32.4%	133,817 32.4%	5.4%	5.1	5.3	5.6	5.7	5.9	14.4%
Suburban	295,983 14.6%	312,522 14.6%	346,395 14.9%	357,899 15.3%	376,324 15.5%	27.1%	61,029 15.5%	62,639 15.6%	66,373 16.0%	68,096 16.4%	68,116 16.5%	11.6%	4.8	5.0	5.2	5.3	5.5	13.9%
Large town ³	380,811 18.8%	408,450 19.1%	432,481 18.6%	447,833 19.1%	462,650 19.1%	21.5%	73,725 18.8%	75,812 18.9%	76,663 18.5%	77,615 18.7%	77,657 18.8%	5.3%	5.2	5.4	5.6	5.8	6.0	15.3%
Small town and rural	679,634 33.6%	715,148 33.4%	772,355 33.3%	771,833 32.9%	796,802 32.9%	17.2%	127,576 32.5%	128,623 32.1%	132,935 32.1%	133,805 32.2%	132,599 32.1%	3.9%	5.3	5.6	5.8	5.8	6.0	12.8%
Missing	15,557 0.8%	17,453 0.8%	13,095 0.6%	4,266 0.2%	2,314 0.1%	-85.1%	3,641 0.9%	3,787 0.9%	3,073 0.7%	1,185 0.3%	646 0.2%	-82.3%	4.3	4.6	4.3	3.6	3.6	-16.2%
Total	2,021,660 100.0%	2,143,406 100.0%	2,322,390 100.0%	2,346,437 100.0%	2,421,011 100.0%	19.8%	392,975 100.0%	400,737 100.0%	413,768 100.0%	414,955 100.0%	412,835 100.0%	5.1%	5.1	5.3	5.6	5.7	5.9	14.0%

¹ Rural-urban commuting area (WWAMI Rural Health Research Center, 2006)

² Examples: Auburn, Bangor, Biddeford, Cape Elizabeth, Falmouth, Freeport, Gorham, Kittery, Kittery Point, Lewiston, Portland, Scarborough, South Freeport, Westbrook, Windham, and Yarmouth

³ Examples: Acton, Albion, Gardiner, Georgetown, Hallowell, Harpswell, and Mount Vernon

Source: Muskie School of Public Service analysis of Maine PMP data

Table 3A. Medication use by therapeutic class, Maine PMP data, 2006-2010

Therapeutic class	Number and percent of prescriptions						Number and percent of patients ¹						Number of prescriptions per patient ²					
	2006	2007	2008	2009	2010	Percent change 2006-2010	2006	2007	2008	2009	2010	Percent change 2006-2010	2006	2007	2008	2009	2010	Percent change 2006-2010
Pain reliever	1,081,921 53.5%	1,133,965 52.9%	1,207,145 52.0%	1,192,479 50.8%	1,163,265 48.0%	7.5%	274,782 57.8%	280,078 54.7%	288,629 54.1%	285,571 52.7%	277,691 50.1%	1.1%	3.9	4.0	4.2	4.2	4.2	6.4%
Sedative	139,686 6.9%	152,859 7.1%	180,507 7.8%	196,073 8.4%	209,794 8.7%	50.2%	40,853 8.6%	42,452 8.3%	46,657 8.7%	49,828 9.2%	50,910 9.2%	24.6%	3.4	3.6	3.9	3.9	4.1	20.5%
Stimulant	203,879 10.1%	224,953 10.5%	257,307 11.1%	269,971 11.5%	286,955 11.9%	40.7%	31,317 6.6%	32,862 6.4%	35,845 6.7%	38,768 7.2%	40,598 7.3%	29.6%	6.5	6.8	7.2	7.0	7.1	8.6%
Tranquilizer	556,033 27.5%	591,053 27.6%	636,117 27.4%	642,522 27.4%	658,630 27.2%	18.5%	128,113 27.0%	133,166 26.0%	138,708 26.0%	141,968 26.2%	142,915 25.8%	11.6%	4.3	4.4	4.6	4.5	4.6	6.2%
Hormone replacement	8,703 0.4%	10,065 0.5%	12,103 0.5%	13,580 0.6%	15,817 0.7%	81.7%	2,660 0.6%	2,969 0.6%	3,526 0.7%	4,057 0.7%	4,606 0.8%	73.2%	3.3	3.4	3.4	3.3	3.4	5.0%
Other	31,438 1.6%	30,511 1.4%	29,211 1.3%	31,812 1.4%	86,550 3.6%	175.3%	21,114 4.4%	20,728 4.0%	20,099 3.8%	21,271 3.9%	37,454 6.8%	77.4%	1.5	1.5	1.5	1.5	2.3	55.2%
Total	2,021,660 100.0%	2,143,406 100.0%	2,322,390 100.0%	2,346,437 100.0%	2,421,011 100.0%	19.8%	475,065 100.0%	512,255 100.0%	533,464 100.0%	541,463 100.0%	554,174 100.0%	16.7%	N/A ²	N/A	N/A	N/A	N/A	N/A

¹ The total numbers of patients in this table are greater than the total in Table 1 because patients are counted once for each therapeutic class in which they had prescriptions.

² The total average number of all prescriptions per patient is not applicable because some patients were counted more than once.

Source: Muskie School of Public Service analysis of Maine PMP data

Table 4A. Medication use by schedule, Maine PMP data, 2006-2010

Schedule ¹	Number and percent of prescriptions						Number and percent of patients ²						Number of prescriptions per patient ³					
	2006	2007	2008	2009	2010	Percent change 2006-2010	2006	2007	2008	2009	2010	Percent change 2006-2010	2006	2007	2008	2009	2010	Percent change 2006-2010
Schedule II	634,970 31.4%	687,190 32.1%	749,742 32.3%	760,232 32.4%	801,319 33.1%	26.2%	128,268 24.6%	133,049 24.9%	139,931 25.2%	141,294 25.4%	145,680 26.2%	13.6%	5.0	5.2	5.4	5.4	5.5	11.1%
Schedule III	570,459 28.2%	599,370 28.0%	646,056 27.8%	651,768 27.8%	666,613 27.5%	16.9%	209,006 40.1%	213,867 40.0%	220,654 39.7%	220,071 39.5%	215,484 38.8%	3.1%	2.7	2.8	2.9	3.0	3.1	13.3%
Schedule IV	816,231 40.4%	856,846 40.0%	926,592 39.9%	934,437 39.8%	953,079 39.4%	16.8%	183,997 35.3%	188,322 35.2%	194,736 35.1%	195,963 35.2%	194,159 35.0%	5.5%	4.4	4.5	4.8	4.8	4.9	10.7%
Total	2,021,660 100.0%	2,143,406 100.0%	2,322,390 100.0%	2,346,437 100.0%	2,421,011 100.0%	19.8%	521,271 100.0%	535,238 100.0%	555,321 100.0%	557,328 100.0%	555,323 100.0%	6.5%	N/A	N/A	N/A	N/A	N/A	N/A

¹ Schedules are established by the U.S. Drug Enforcement Agency (DEA).

² The total number of patients in this table is greater than the total in Table 1 because patients are counted once for each schedule in which they had prescriptions.

³ The average number of all prescriptions per patient is not applicable because some patients were counted more than once.

Source: Muskie School of Public Service analysis of Maine PMP data

Table 5A. Medication use by source of payment, Maine PMP data, 2006-2010

Source of payment	Number and percent of prescriptions						Number and percent of patients ¹						Number of prescriptions per patient ²					
	2006	2007	2008	2009	2010	Percent change	2006	2007	2008	2009	2010	Percent change	2006	2007	2008	2009	2010	Percent change
Cash	252,186 12.5%	250,746 11.7%	277,314 11.9%	260,862 11.1%	231,924 9.6%	-8.0%	87,533 18.8%	85,850 18.3%	89,535 18.6%	85,855 17.7%	78,237 15.3%	-10.6%	2.9	2.9	3.1	3.0	3.0	2.9%
Medicaid	457,695 22.6%	377,316 17.6%	406,152 17.5%	396,413 16.9%	436,833 18.0%	-4.6%	75,315 16.2%	62,236 13.3%	62,726 13.0%	62,007 12.8%	65,097 12.7%	-13.6%	6.1	6.1	6.5	6.4	6.7	10.4%
Medicare	83,648 4.1%	118,111 5.5%	99,341 4.3%	85,992 3.7%	78,954 3.3%	-5.6%	16,823 3.6%	19,633 4.2%	14,570 3.0%	13,249 2.7%	13,275 2.6%	-21.1%	5.0	6.0	6.8	6.5	5.9	19.6%
Commercial insurance	1,216,169 60.2%	1,384,325 64.6%	1,527,341 65.8%	1,593,592 67.9%	1,548,970 64.0%	27.4%	284,109 61.0%	298,083 63.6%	311,543 64.8%	321,619 66.3%	308,142 60.1%	8.5%	4.3	4.6	4.9	5.0	5.0	17.4%
Other³	9,053 0.4%	9,491 0.4%	8,625 0.4%	6,275 0.3%	23,438 1.0%	158.9%	1,807 0.4%	1,939 0.4%	1,785 0.4%	1,571 0.3%	7,385 1.4%	308.7%	5.0	4.9	4.8	4.0	3.2	-36.5%
Unknown	2,909 0.1%	3,417 0.2%	3,617 0.2%	3,303 0.1%	100,892 4.2%	3368.3%	515 0.1%	605 0.1%	583 0.1%	896 0.2%	40,217 7.8%	7709.1%	5.6	5.6	6.2	3.7	2.5	-55.6%
Total	2,021,660 100.0%	2,143,406 100.0%	2,322,390 100.0%	2,346,437 100.0%	2,421,011 100.0%	19.8%	466,102 100.0%	468,346 100.0%	480,742 100.0%	485,197 100.0%	512,353 100.0%	9.9%	N/A	N/A	N/A	N/A	N/A	N/A

¹ The total number of patients in this table is greater than the total in Table 1 because patients are counted once for each payment type in which they had prescriptions.

² The average number of all prescriptions per patient is not applicable because some patients were counted more than once.

³ Includes Indian nation, military, and worker compensation

Source: Muskie School of Public Service analysis of Maine PMP data