VERMONT
DEPARTMENT OF HEALTH

Prescription Drug Misuse – Epidemiological Perspective
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There are two major categories that are subsumed by this class of substances:

1. Prescription medications used for non-medical purposes
    a. Pain medications (e.g., Vicodin®, OxyContin®)
    b. ADD medications (e.g., Adderall®, Ritalin®)
    c. Anxiolytics (tranquilizers and sedatives; e.g., Valium®)
    d. Stimulants (e.g., amphetamines)
    e. Other (e.g., anti-depressants, steroids)
2. Medications used to treat opiate addictions such as methadone or buprenorphine (used without a prescription or for a non-medical purpose)

1. Prescription Medication Misuse

A. *Non-medical Use of Pain Relievers*

Table 1 presents US and Vermont specific prevalence rate trends for non-medical use of pain relievers in the past year from the National Survey on Drug Use and Health (NSDUH) by age group. As shown in the table, Vermont rates and rankings relative to other states are declining or steady across time in general. None of the year to year differences (either increase or decrease) are statistically significant.

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Table 1
Prevalence of Nonmedical Use of Pain Relievers in the Past Year for Vermont and the US (NSDUH)
(Ranks compare Vermont to 49 other states and the District of Columbia)

	Total %			AGE GROUP (Years)								
				12-17			18-25			26 or Older		
	VT	US	VT Rank	VT	US	VT Rank	VT	US	VT Rank	VT	US	VT Rank
2002-2003	5.4	4.8	*11*	8.9	7.6	*10*	14.6	11.7	*7*	3.3	3.2	*21*
2003-2004	5.0	4.8	*26*	8.1	7.5	*20*	13.4	12.0	*14*	3.1	3.2	*29*
2004-2005	4.9	4.8	*27*	7.3	7.1	*27*	13.4	12.1	*20*	3.1	3.2	*32*
2005-2006	5.1	4.8	*25*	7.2	7.0	*25*	14.7	12.4	*10*	3.2	3.4	*33*
2006-2007	4.8	5.1	*30*	6.6	6.9	*32*	13.9	12.3	*17*	3.0	3.6	*36*

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The 2007 Youth Risk Behavior Survey (YRBS) indicates that 16% of 8th to 12th graders in Vermont have taken a prescription drug not prescribed for them sometime in their lifetime (84% report no use, 7% report using 1-2 times, and 9% report using 3 or more times). Rates were comparable for male and female students. A similar question was asked on the 2006 Youth Health Survey (YHS); 14% of respondents on the YHS reported ever using prescription medication not prescribed to them (6% report 1-2 times; 8% report 3 or more times).[3]

Preliminary results from the Behavioral Risk Factors Surveillance System (BRFSS) were recently made available by the Centers for Disease Control and Prevention (CDC) for the State of Vermont for the 2007 survey. These data were collected on a representative sample of Vermonters age 18 and up. Questions concerning prescription drug misuse were asked for the first time on this annual survey. The data are summarized in Table 2.

Table 2
Vermont Prescription Drug Misuse
BRFSS Prevalence

2007

	Males	Females	Total
Ever **used Rx drug w/o own prescription**	11.7	7.0	8.9
Ever **used Rx in greater amounts than prescribed**	9.7	5.4	7.5
Used Rx drug w/o own prescription ***during past 30 days***	2.1	0.8	1.4
Used Rx in greater amounts than prescribed ***during the past 30 days***	1.6	0.7	1.1

2008

	Males	Females	Total
Ever **used Rx drug w/o own prescription**	12.4	6.2	9.2
Ever **used Rx in greater amounts than prescribed**	10.8	4.8	7.7
Used Rx drug w/o own prescription ***during past 30 days***	1.9	0.7	1.3
Used Rx in greater amounts than prescribed ***during the past 30 days***	1.7	0.9	1.3

B. *Tranquilizers, Sedatives, and Stimulants (including ADD Drugs)*

Currently, there are no state-level annual data on other classes of prescription medications. Three year averages from 2002-2004 NSDUH indicate very low prevalence rates in Vermont for all these drugs.[4]

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[3] On both the YRBS and YHS, the question asks about **all** prescription drugs, not just those used for pain, ADD, or anxiety. It is likely that prescription drugs that treat allergies, depression, and other non-pain related but common adolescent maladies account for at least some proportion of these rates. Both the YRBS and YHS Workgroups will be revising the question for future administrations to more precisely assess misuse of pain, ADD, and other medications.

[4] Tranquilizers: VT = 1.7%, US = 2.1%; Sedatives: VT = 0.2%, US = 0.4%; Stimulants: VT = 1.5%, US = 1.2%; Any use of prescription drugs for nonmedical purposes: VT = 6.2%, US = 6.2%.

The annual Monitoring the Future Study (conducted nationally) indicates that misuse of a variety of prescription medications among 12th graders and young adults (19-28) has been relatively stable nationally since 2002 (Tables 3 & 4).[5] Note that the 15.4% *annual* prevalence rate for "Any Rx Drug" in 2007 suggests that Vermont's state-level past year rate would be significantly lower based on the 2007 YRBS *lifetime* rate of 16% (lifetime rates encompass a longer period and therefore will by definition be higher than past-year rates. That is, the smaller the selected time frame, the lower the rate.)[6]

Table 3

Past Year Prevalence Rates (%) for selected drugs over Time among 12th Graders (Available lifetime prevalence rates in parenthesis – see footnote 5)

MTF 12th Graders (Annual)							
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
OxyContin®	4	4.5	5.0	5.5	4.3	5.2	4.7
Vicodin®	9.6	10.5	9.3	9.5	9.7	9.6	9.7
Sedatives	6.7 (9.5)	6.0 (8.8)	6.5 (9.9)	7.2 (10.5)	6.6 (10.2)	6.2 (9.3)	5.8 (8.5)
Tranquilizers	7.7 (11.4)	6.7 (10.2)	7.3 (10.6)	6.8 (9.9)	6.6 (10.3)	6.2 (9.5)	6.2 (8.9)
Ritalin®	4.0	4.0	5.1	4.4	4.4	3.8	3.4
Any Rx Drug	17.8	16.9	17.5	16.7	16.5	15.4	N/A

Table 4

Past Year Prevalence Rates (%) for selected drugs over Time among Young Adults (Available lifetime prevalence rates in parenthesis – see footnote 5)

MTF Ages 19-28 (Annual)						
	2002	**2003**	**2004**	**2005**	**2006**	**2007**
OxyContin®	1.9	2.6	3.1	3.1	3.1	2.9
Vicodin®	8.2	8.6	8.9	9.3	9.1	8.9
Sedatives	3.9 (8.0)	3.9 (8.7)	4.4 (9.7)	4.2 (10.0)	3.9 (9.5)	4.2 (9.8)
Tranquilizers	7.0 (13.4)	6.8 (13.8)	7.4 (14.9)	6.7 (14.5)	6.5 (15.0)	7.1 (14.5)
Ritalin®	2.9	2.9	2.7	2.5	2.6	2.4
Any Rx Drug	13.7	14.8	14.7	15.0	14.6	N/A[7]

[5] The MTF study does not report lifetime prevalence for the specific drugs listed in Tables 3 & 4.

[6] For example, the past month prevalence in Vermont for marijuana consumption in 12-17 year olds is 10.5%, past year is 17.2%, while the lifetime rate for this age group is 35% (NSDUH and YRBS)

[7] As of 2007, this prevalence rate is no longer reported by Monitoring the Future because the "measures of Rx drugs vary across time and we were concerned that any apparent trends were affected by the shifting definitions of drugs" (O'Malley, personal communication, 11/3/08). We note a similar problem identified with the 2007 YRBS generic drug question (see Footnote 3).

Table 5
Past Month Nonmedical Use of Prescription Drugs (among Persons 12+:2002-2006)
NSDUH[8]

NSDUH (30)	2002	2003	2004	2005	2006	2007
Pain Relievers	1.9	2	1.8	1.9	2.1	2.1
Stimulants	0.6	0.5	0.5	0.4	0.5	0.4
Sedatives	0.2	0.1	0.1	0.1	0.2	0.1
Tranquilizers	0.8	0.8	0.7	0.7	0.7	0.7

State and local rates of methadone misuse as a pain reliever are difficult to ascertain at this time. National data (Monitoring the Future) indicate that rates of reported use of methadone have remained relatively steady among 9th-12th graders; however, the absolute rates are still very low (2006 = 1.2%). The National Survey on Drug Use and Health (NSDUH) does not report methadone as a separate drug but combines it with other pain relievers. Table 5 presents past 30-day nonmedical use of selected drugs for individuals 12 and older over time from NSDUH. These are national data; as can be seen, there is no marked increase or decrease for any of the medications across years. However, two points should be noted. First, there is an ever increasing supply of these medications but no concomitant increase in the rate of misuse. Second, there is less of a gender difference in the nonmedical use of prescription drugs than for any other licit or illicit drugs. For example, about 30% of heroin users are female, but about 44% of those who misuse OxyContin® are female.[9]

Medications Used to Treat Opiate Addictions

Methadone is prescribed to treat heroin dependence and is a potent pain reliever as well, while the two buprenorphine compounds (Subutex®, Suboxone®) were developed specifically to treat opiate addiction. Methadone as a treatment for heroin addiction is administered in a controlled environment (i.e., methadone clinics) while the buprenorphine pharmaceuticals can be prescribed by physicians who have had specialized training in the pharmacology and administration of the drug. The notion behind buprenorphine is that more individuals would opt to be treated by their private physicians than would access drug abuse clinics. Thus, the hope is that, like depression, more individuals would receive treatment; and stigmatization for opioid dependence would be reduced. However, these drugs have been misused in a number of ways[10]; they have been taken when no longer prescribed, in higher doses than prescribed, and refined for an unintended route of administration (i.e., injection).

The diversion, misuse, and abuse of these medications have been somewhat of a surprise to the expert panel of addiction specialists who recommended development of the drugs

[8] NSDUH does not report lifetime or annual rates of specific prescription drugs
[9] http://www.oas.samhsa.gov/2k4/oxycodoneH/oxycodoneH.pdf

[10] Anti-Depressants have also been misused but not to the extent or for the same purposes as other psychotropics that are discussed in this paper. It is possible to take anti-depressants at higher dosages than prescribed and obtain them from a non-medical source (e.g., friend or relative).

and conducted the initial clinical trials. Because of the specific formulation, abuse potential for Suboxone® was thought to be very low. Since Vermont is on the leading edge of the physician office buprenorphine prescription program, diversion and misuse rates are likely to be higher than other states.

Illicit Drugs (Other than Marijuana)

Although these are primarily "street drugs" not obtained by any legitimate means, prevalence rates of illicit substances are part of the overall epidemiological profile for Vermont. Rates of use and abuse of drugs such as cocaine, heroin, methamphetamines, in Vermont have been relatively low and not increasing over the past several years as measured by the YRBS and NSDUH surveys. In the past, state-level alerts were issued for potentially significant increases of heroin and methamphetamines entering Vermont, but no rise in use (or abuse) rates were documented for either drug. This may have been partially a function of the early warnings and subsequent preparedness of relevant state and local agencies. Rates of use of both drugs in Vermont are low and not increasing across time.

Inhalants

Inhalant misuse (e.g., glue, aerosols, etc.) though not prescription medications has been of concern, especially among younger age groups. As reported on the YRBS, inhalant use has been steadily declining since 1995. According to the 2007 report the prevalence rate for lifetime use is 12% for both males and females. This is less than half the rate reported in 1995. There have also been a few isolated cases of reported misuse of prescription inhalers intended for chronic asthma treatment. Prevalence data are not currently regularly monitored because abuse potential is thought to be quite low. There has been only one study published on the misuse of asthma inhalers. Results suggested that rates of misuse are very low, correlated with other drug and alcohol abuse, and weakly associated with a perceived enhancement of athletic performance (for steroid inhalers).[11]

Other Data Sources

Although not technically considered epidemiological, below we discuss three adjunct data sources that may have some indirect relevance. These findings may be epiphenomenal and are not representative of general trends of prescription drug misuse; we caution against over-interpretation. As noted earlier, national and state-level surveys have not shown a significant increase in the misuse of these drugs at a population level.

Treatment

[11] Boyd, McCabe, & Teeter (2006). Asthma Inhaler Misuse and Substance Abuse: A Random Survey of Secondaru School Students. *Addictive Behaviors, 31*, 278-287.

Overall (primary, secondary, and tertiary diagnoses) marijuana is the second largest treatment burden behind alcohol in the Vermont treatment system. However, in 2006 opiate dependence (other than heroin and non-prescription methadone) became second only to alcohol in primary diagnosis in treatment centers supported by VDH. Several recent published studies suggest that over 80% of non-medical users of OxyContin® are current abusers of other licit and illicit substances and not naïve consumers of pain medications Thus, these data suggest initiating use of opioid analgesics for legitimate pain relief rarely leads to misuse.[12]

> "Steps need to be taken to reduce prescription drug abuse, but very great care needs to be exercised in the nature of these actions so the legitimate and appropriate use of these drugs in the treatment of pain is not compromised as a result." (Cicero, Inciardi, & Muñoz (2005, p.662).

Northern New England Poison Center

Opioids account for the largest number of Poison Center calls in Vermont for medication verification[13] by both law enforcement and non law enforcement. However, among substance abuse cases[14], stimulants and street drugs account for the largest burden of calls followed by alcohol. "*Poison center substance abuse data do not always reflect general substance abuse trends, but represent unusual cases that are medically more difficult to treat.*"[15]

Crime

There has been several recent newspaper reports about an increase in criminal activity associated with drug activities directly (e.g., assaults) or indirectly (e.g., robbery, larceny). In addition, police and prosecutors have suggested an increase in both drug trafficking and crimes associated with drug seeking, especially opioid analgesics (e.g., OxyContin®, Vicodin®). Figures1-4 present Vermont crime rates for specific classes of crimes from 1990-2007[16] Figure 5 presents Drug Enforcement Administration (DEA) arrests in Vermont from 2000-2007[17]. Figure 6 and Table 6 from the Vermont Crime Information Center present a slightly different picture.[18] These data suggest an increase in arrests for drug/narcotic violations (+23.9%) and a significant increase in drug-specific

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[12] Cicero, Inciardi, & Munoz (2005). Trends in Abuse of OxyContin and Other Opioid Analgesics in the United States: 2002-3004. *The Journal of Pain*, *10*, 662-672.
Sees, Marino, Ruediger, Sweeney, & Shiffman (2005). Non-medical Use of OxyContin® Tablets in the United States. *Journal of Pain & Palliative Care Pharmacotherapy*, *19*, 13-23.
Carise, Leggett, McLellan, Camilleri, Woody, & Lynch (2007). Prescription OxyContin Use Among Patients Entering Addiction Treatment. *Ameican Journal of Psychiatry*, *164,* 1750-1756.
[13] Medication is identified by shape, color, size, and markings
[14] A substance abuse case is not confirmed with a clinical diagnosis but is determined by self report, someone else on the patient's behalf or poison center staff assessment
[15] Northern New England Poison Center 1/17/08
[16] Source: Federal Bureau of Investigation Uniform Crime Reports, 2008
[17] Source: Drug Enforcement Administration, 2008
[18] Figure 6 and Table 6 were supplied by Max Schlueter, Ph.D. from the Vermont Crime Information Center (VCIC). The "06-07 Change" column was derived by the authors of this report.

incidents since 2003; however, the number of episodes for narcotics, depressants, and hallucinogens decreased in 2007 compared to 2006.

Figure 1: Robbery Index

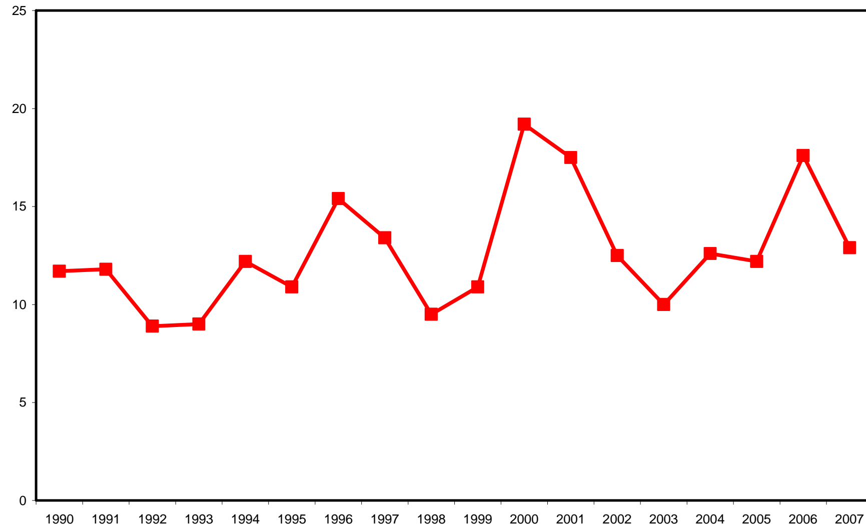

Figure 2: Burglary Index

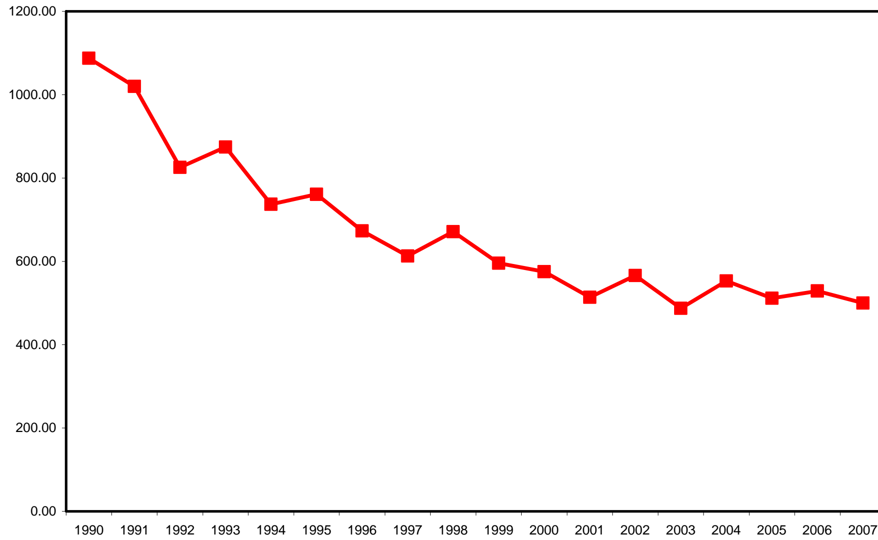

Figure 3: Larceny Index

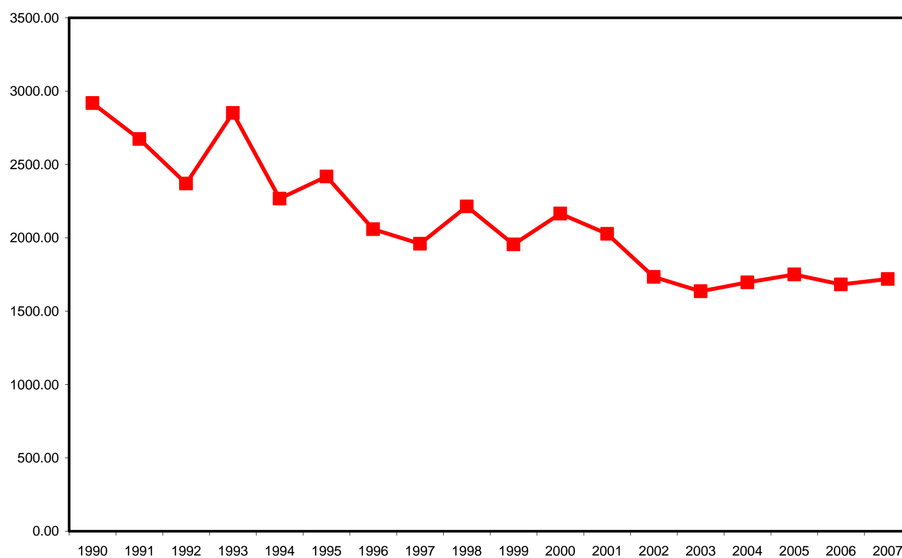

Figure 4: Assault Index

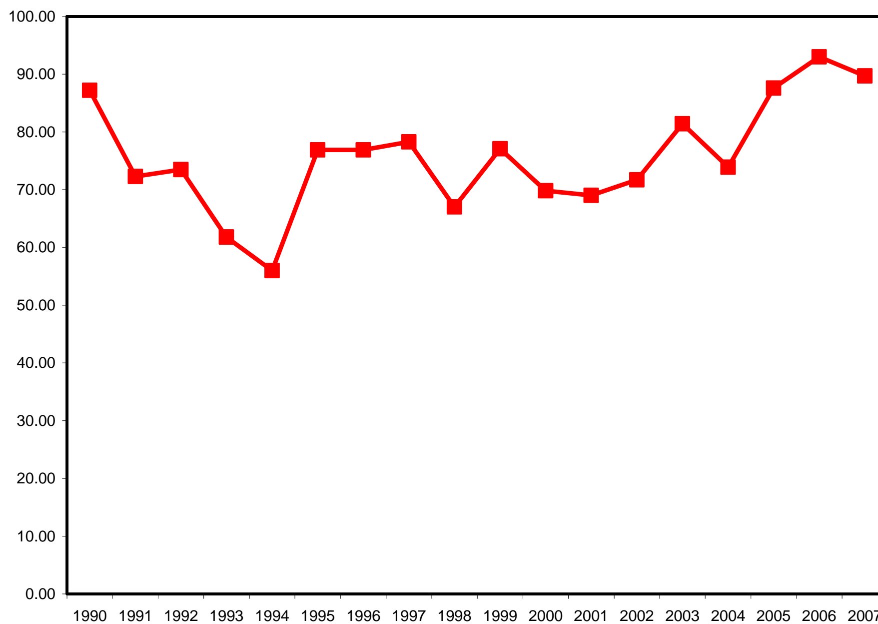

Figure 5
DEA Arrests in Vermont

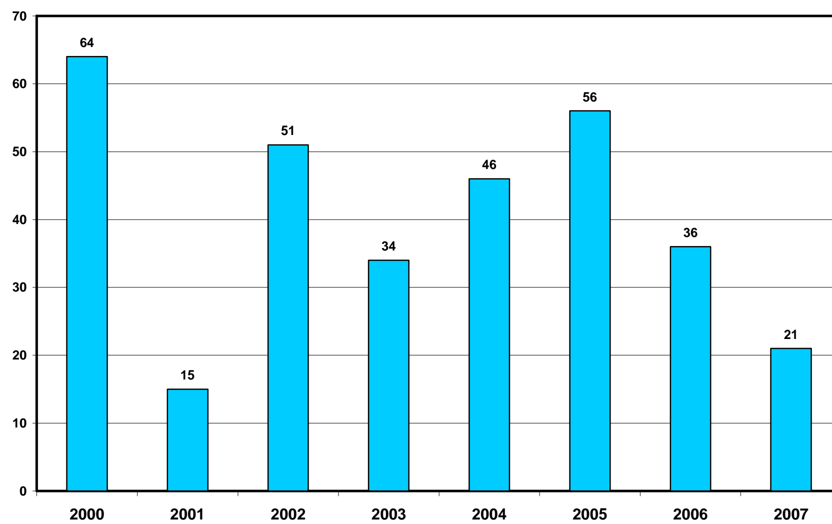

Figure 6: Vermont Drug & Narcotic Arrests

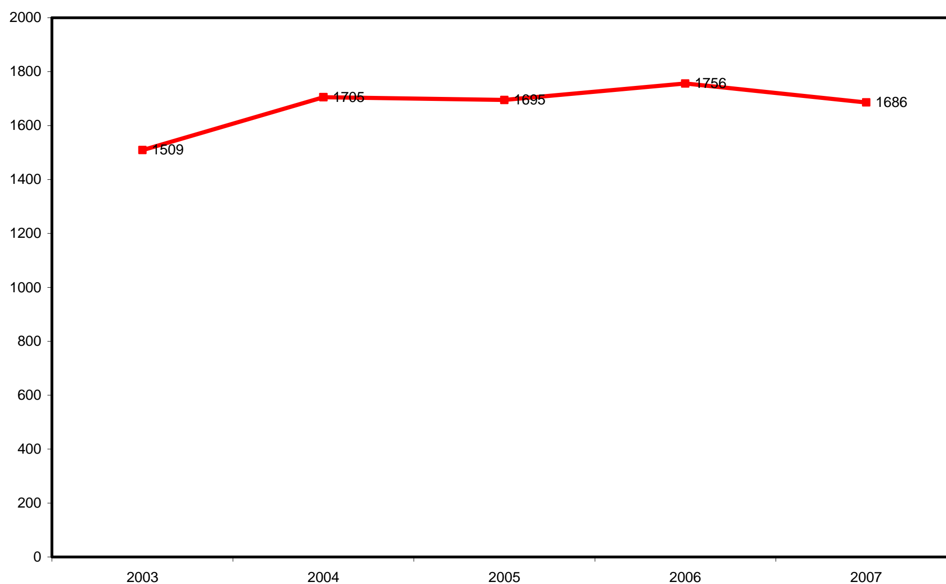

Table 6
Number of Drug Crimes

Drug Type	2003	2004	2005	2006	2007	03-07 Change (%)	06-07 Change (%)
Marijuana/Hashish	1300	1525	2532	1760	1811	39.3	2.9
Narcotics	412	461	591	612	510	23.8	-16.7
Depressants	10	12	21	55	37	270	-32.7
Stimulants	18	16	32	49	49	172.2	0
Hallucinogens	17	17	23	44	7	-58.8	-84.1

Conclusion

This overview of the epidemiological data on prescription drug misuse in Vermont is but one perspective on a very complex issue. While population prevalence rates and trends over time of misuse are fundamental to an overall assessment of the problem, relevant data on the impact in other areas such as the treatment and judicial systems may add to a fuller understanding of this multifaceted puzzle. There may be a higher penetration of diverted prescription drugs in specific high risk subpopulations, (e.g., current substance abusers, those already in prison, those presenting to an ER, etc.) not captured in general population surveys. What we know from the epidemiological data is that prescription drug misuse is a relatively minor disturbance in the overall picture of substance use in Vermont; especially in comparison to marijuana use and alcohol abuse where Vermont ranks among the worst in the nation across all age groups. With respect to prescription drug misuse, Vermont epidemiological data are remarkable for their stability over time and across data sets. Additional data from future administrations of the YRBS, YHS, BRFSS, and NSDUH will allow for these State trends to be monitored closely Finally, the ability to track and analyze other, more targeted data sources would considerably strengthen our capacity to understand specific aspects of prescription drug misuse in Vermont beyond the general population data addressed here.