Prescription Drug Monitoring Program Center of Excellence at Brandeis

Briefing on PDMP Effectiveness

Updated April 2013

This project was supported by Grant No. 2011-PM-BX-K002 awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, the Office for Victims of Crime, and the Office of Sex Offender Sentencing, Monitoring, Apprehending, Registering, and Tracking . Points of view or opinions in this document are those of the author and do not necessarily represent the official position or policies of the U.S. Department of Justice.

Briefing on PDMP Effectiveness

Summary

Evidence continues to accumulate that prescription drug monitoring programs (PDMPs) are effective in reducing diversion of controlled substances, improving clinical decision-making, and assisting in other efforts to curb the prescription drug abuse epidemic.

Th Prescription Drug Abuse Epidemic

Addiction, overdoses and deaths involving non-medical prescription drug use, especially narcotic pain relievers, have risen dramatically over the last decade. In 2010, drug-related poisonings were the leading cause of death due to unintentional injuries in the United States. The number of overdose deaths involving prescription opioids has more than tripled since 1999; in 2010 these deaths were greater than those involving heroin and cocaine combined.[1] recent study estimated that in 2006 the total cost in the United States of nonmedical use of prescription opioids was $53.4 billion.[2] More information regarding the epidemic is available on the PDMP Center of Excellence website.[3]

Th Essential Role of Prescription Drug Monitoring Programs

PDMPs collect data from pharmacies on dispensed controlled substance prescriptions and make it available to authorized users, often by means of a secure, electronically accessible database. As of January 2013, 4 states and one territory had passed legislation authorizing a PDMP, and 43 states had an operating PDMP. Research and accumulated experience strongly suggest that PDMPs serve essential functions in combating the prescription drug abuse epidemic.[4, 5,6,7, 8] They can help identify major sources of prescription drug diversion such as prescription fraud, forgeries, doctor shopping[9] and improper prescribing and dispensing. PDMPs are also important resources for practitioners and third party payers, giving them information on patients' use of controlled substances that is crucial for providing good medical care and ensuring patient safety. recent cost-benefit analysis indicates that PDMPs can save states millions of dollars by reducing prescription drug abuse and diversion.[10] More information on PDMPs is available on the PDMP Training and Technical Assistance website.[11]

Listed below are recent research studies, evaluations, surveys and other reports demonstrating PDMP effectiveness in improving medical care, reducing doctor shopping and prescription fraud, and assisting in drug diversion investigations. Such outcomes can contribute to lowering rates of addiction, overdose and death associated with misuse of prescription drugs.

Use of PDMP data can assist clinically appropriate prescribing, improve medical care, and reduce doctor shopping and its contribution to drug-related deaths.

- study of medical providers in Ohio emergency departments found that 41% of those given PDMP data altered their prescribing for patients receiving multiple simultaneous narcotics prescriptions. Of these providers, 61% prescribed no narcotics or fewer narcotics than originally planned, while 39% prescribed more. [12] Another study found that consulting the PDMP increased physicians' confidence that the controlled substances they prescribed were medically warranted.[13] This indicates that PDMP data can help inform sound clinical decision-making to ensure prescriptions are medically necessary, reducing illicit use of controlled substances.

- survey of prescribers in Rhode Island and Connecticut found that those who made use of PDMP data were more likely than non-users to take clinically appropriate action in response to suspected cases of prescription drug abuse or diversion by patients, such as conducting drug screens or referring them to substance abuse treatment.[14]
- The Oklahoma PDMP is conducting an ongoing survey of prescribers; preliminary findings suggest PDMP utilization has an impact on clinical decision-making. Results show that 63% of respondents report that PDMP data has helped them identify patients who were abusing prescription medications, and 64% said data helped identify patients who were doctor shopping. The survey also found that based on a PDMP report, 21% of prescribers referred patient(s) to treatment, 21% to a mental health professional, 64% to a pain management specialist, and 25% to law enforcement; 71% reported changing the type of controlled substance or refusing to prescribe a controlled substance as result of viewing PDMP data.[15]
- survey of prescribers and pharmacists in Oregon found that majorities of respondents thought that use of the PDMP would be very useful in monitoring prescriptions and reducing doctor shopping. Many reported taking clinically relevant action after viewing PDMP data, including talking to the patient to confirm or disconfirm suspicions of doctor shopping, altering prescribing in response to new information, and referring patients to substance abuse treatment or pain management.[16]
- Within six months of the inception of a British Columbia prescription monitoring system, medically unwarranted prescriptions for opioids fell by 33% and for benzodiazepines by 49%.[17]
- In California, 74% of physician responders to a survey indicated they had changed their prescribing practices to a patient as result of using PDMP Patient Activity Reports [PARs], and 91% rated the "effectiveness of the PAR in maintaining the care and health of your patient" as good to excellent.[18]
- 2010 survey of users of Kentucky's PDMP, Kentucky All Schedule Prescription Electronic Reporting (KASPER), found that PDMP reports aided clinical practice, with 70% of respondents judging them "very" or "somewhat" important in helping them decide what drug to prescribe a patient. The survey also found that nearly 90% of prescribers and pharmacists responding to the survey "refused to prescribe or dispense a controlled substance based on the information contained in a KASPER report." [19]
- A impact evaluation of the Maine PDMP found that 97% of prescribers and pharmacies responding to survey found the PDMP to be useful in monitoring prescriptions and controlling doctor shopping.[20]
- After four years of increases in the diversion of high dosage buprenorphine via doctor shopping in the Bouche de Rhone area of France, a measure of doctor shopping declined 22% in the period following the initiation of prescription monitoring for buprenorphine, with no marked effect on treatment access.[21]
- A analysis by Wyoming's PDMP indicates that as prescribers and pharmacists received unsolicited PDMP reports concerning likely doctor shoppers, and as they requested more reports on patients, the number of likely doctor shoppers in the PDMP database declined markedly, as measured by the numbers of individuals meeting the threshold set by the State of Wyoming for doctor shopping. This suggests that PDMP reports prompt prescribers and pharmacists to reduce the availability of controlled substances to patients engaged in doctor shopping, thus reducing addiction, abuse and costs related to prescriptions.[22]

- A analysis of data from the Nevada PDMP indicates that for those probable doctor shoppers for whom unsolicited reports were sent, the mean number of dosage units of controlled substances dispensed for them declined o average 41% in the year following the reports. After the inception of unsolicited reporting in 1997, the mean number of prescribers who prescribed to those identified as probable doctor shoppers dropped from 2 in 199 to 1 in 2002, decline of 36%, and the mean number of pharmacies that dispensed to probable doctor shoppers dropped from 16 to 12, a decline of 25%.[23]

- Data from the Virginia PDMP show that in the period following a rapid increase in PDMP data utilization, the number of individuals meeting criteria for doctor shopping dropped by 44%.[24]

- After the inception of the Florida PDMP, doctor shopping declined 35% during FY 2012 (October 1, 201 to September 30, 2012) for individuals visiting five or more prescribers and five or more pharmacies within 90 days. This decline is likely attributable in large part to use of the PDMP, which has logged over 2.3 million queries to its database by prescribers and pharmacists. The decline in activity indicative of doctor shopping has in turn likely contributed to a drop in drug-related deaths in the state: those attributable to oxycodone overdose in 201 fell by 18% and overall drug deaths fell by 6.3%.[25]

- In September 2008, Louisiana required pharmacies to begin submitting data to the new PDMP on January 1, 2009, including an identification number from persons picking u prescriptions. Many pharmacies then began requiring customers to show ID, to record the numbers, and to inform customers about the new policy. Five individuals identified by the PDMP as doctor shoppers, who each obtained an average of 16.9 controlled substances prescriptions per month prior to September, dropped to prescriptions by December. Louisiana attributes this important change to the PDMP implementation.[26]

- As the Massachusetts PDMP began sending unsolicited PDMP reports regarding possible doctor shoppers to prescribers in 2010, prescribers were asked about the usefulness of the reports. Of those who responded, only 8% said they were "aware of all or most of other prescribers," and only 9% said "based on current knowledge, including the report, the patient appears to have legitimate medical reason for prescriptions from multiple prescribers." This indicates that proactive reporting of PDMP data alerts prescribers about possible doctor shopping, which in turn can inform their prescribing practices.[27]

Use of PDMP data by third party payers can improve medical care and reduce drug and medical claims related to inappropriate prescribing.

- January 2013 report from the California's Workers' Compensation Institute estimates that the potential savings from enhanced opioid management controls made possible by California's PDMP would be $57.2 million, with a return on investment estimated at $15.50 to $1.[28] Given the potential for PDMP data to reduce the costs of workers' compensation claims and lost productivity attributable to prescription drug abuse, the American Insurance Association recommends that "It is essential for there to be broad [third party payer] access to PDMP data."[29]

- Washington State's PDMP provides data to Medicaid and workers' compensation programs. Access to PDMP data, which tracks all dispensed prescriptions including those paid for by cash, has allowed both programs to more quickly and reliably identify patients who may be at risk of prescription drug abuse and need changes in their medical care. For example, in match of Medicaid enrollees to PDMP data, more than 2,000 persons were identified who obtained controlled substance

prescription paid by Medicaid and second prescription paid in cash on the same day.[30]

- WellPoint/Anthem Blue Cross Blue Shield of Virginia, a health insurance payer, estimated saving $333,418 in drug and medical claims by restricting 100 clients who had been receiving multiple narcotic prescriptions from 5 or more sources over a 90-day period to one pharmacy. PDMP data are essential for the identification of such clients, since they track filled prescriptions from all sources, not just those prescribed by providers within a health insurance network.[31]

- PDMP data identified 2 Medicaid clients appropriate for participation in Washington State's Medicaid "lock-in" program – the Patient Review and Coordination (PRC) program – which restricts at-risk Medicaid clients to one pharmacy and one prescriber for controlled substances. It is estimated that PRC participation results in $6,000 savings per year per client. Since clients stay in lock-in between two and five years, depending on their compliance, savings for these 20 clients were estimated at over $400,000.[32]

States with PDMPs, and states with proactive PDMPs, have lower rates of treatment admissions, reduced doctor shopping and diversion.

- national evaluation comparing states with and without PDMPs and focusing primarily o Schedule I controlled substances (e.g., opioids such as oxycodone) found that proactive PDMPs were associated with slower growth in the per capita availability of prescription pain relievers and stimulants, as well as lower rates of treatment admissions for abuse of these drugs.[33]

- study comparing PDMP states with non-PDMP states found that PDMP states had decreases in the amount of opioid shipments and admission rates to opioid addiction treatment programs.[34]

- study of New York State's PDMP (referred to as a triplicate prescription program in the 1980s) found that after the inception of the program in 1988, in the following year prescribing of benzodiazepines to individuals suspected of drug diversion fell by 95% as measured by insurance claims data. Emergency department visits for drug overdoses involving benzodiazepines dropped by 48% in New York City and Buffalo from 1988 to 1989, and the estimated savings due to the decline in benzodiazepine prescribing for New York's Medicaid program in 1989 and 1990 was $27 million.[35]

States with PDMPs have smaller increases in opiate exposures related to abuse and misuse, lower outpatient drug claims.

- A analysis of poison center data from 2003 to mid-2009 found that in states with PDMPs, calls concerning intentional exposures to opioids (an indicator of opioid abuse or misuse) increased 0.2% per quarter, while in states without PDMPs these calls increased 1.9%.[36]

- The presence of PDMPs collecting prescription information on Schedule II controlled substances is associated with lower outpatient opioid prescribing as measured by insurance claims data compared with states not collecting such information.[37]

States *without* active PDMPs are more likely to experience higher rates of controlled substance distribution.

- A independent evaluation of Kentucky's PDMP noted that in 2006, distribution of oxycodone, as measured by grams per 100,000 population from the Automation of Reports and Consolidated Orders System (ARCOS) system**,** was highest in Florida compared to other states on interstate Route

I-75, while distribution of hydrocodone was highest in Tennessee. Since 2004, oxycodone distribution in Kentucky, a state with a well-established prescription monitoring program, rose at a much lower rate than in either Florida or Tennessee, neither of which had active PDMPs during this period.[38]

PDMPs will likely reduce costs to states stemming from prescription drug abuse and diversion.

- prospective cost-benefit analysis prior to the launch of the Wisconsin PDMP suggested that the economic benefits produced by the program would far exceed the costs of operation, producing savings for the state in health care costs, lost productivity, and reduced drug diversion investigation times in excess of 10 million dollars annually.[39]

PDMP data assist in investigations of drug diversion, reducing investigation times.

- 2010 survey found that nearly three quarters (73%) of law enforcement officers who used Kentucky's PDMP (KASPER) strongly agreed that "KASPER is an excellent tool for obtaining evidence in the investigative process."[40]
- A evaluation of Virginia's PDMP found that investigation times were reduced by use of PDMP data.[41]
- In 2002, the Government Accounting Office reported that the average times for investigations of doctor shoppers in Kentucky dropped from 156 days to 16 days after implementation of KASPER. The same report found that average investigation times for doctor shoppers dropped markedly following the implementation of Nevada's PDMP, from 120 days to 20 days, reducing expenses related to investigations.[42]
- case study of a Kentucky drug diversion investigator provides an example of PDMP data serving as important aids in increasing the efficiency of investigations.[43]

PDMPs can reduce the nee for law enforcement, and help monitor compliance and abstinence.

- Nevada's Pre-Criminal Intervention Program uses PDMP data to identify, enroll, and monitor individuals to help them stop doctor shopping, making law enforcement involvement unnecessary and saving taxpayers the cost of investigations, prosecutions and incarceration.[44]
- Drug courts in Kentucky use PDMP data to help monitor abstinence from prescription drugs, helping clients achieve sobriety and stability. This improves the court's ability to assure compliance and reduces costs related to drug diversion and abuse.[45]

PDMP data can assist in substance abuse treatment and medical examiner practice.

- Substance abuse treatment programs in Maine consult PDMP data when admitting patients into treatment (patient consent required) to help validate patient self-reports on use of medications.[46]
- report from the medical director of an opioid addiction treatment program indicates that PDMP data are an important clinical tool in monitoring use of controlled substances by patients addicted to opioids, keeping patients safe and increasing the effectiveness of treatment.[47] The Substance Abuse and Mental Health Services Administration has issued policy advisory letter recommending use of PDMP data by opioid treatment programs.[48]

- Medical examiners in Virginia consult PDMP data as standard procedure in guiding autopsies and in conducting forensic investigations.[49]

PDMP data show promise in assisting drug abuse prevention and surveillance efforts.

- Project Lazarus, comprehensive overdose prevention program in North Carolina, makes use of PDMP data in motivating and measuring community drug abuse prevention efforts, helping to reduce overdose deaths.[50]
- The PDMP Center of Excellence is developing methods to analyze PDMP data to identify doctor shopping hot spots that can help state and community drug abuse prevention organizations target their interventions for maximum impact.[51]
- Analyses of PDMP data can show trends and geographic patterns of problematic prescribing, such as possible pill mills,[52] and reveal the characteristics and demographics of those at risk for prescription drug abuse, including youth and young adults.[53]

Physicians express support for PDMPs.[54]

- "This has been a huge benefit for our clinic and managing patients' narcotic use. It has improved our clinic and our time required for calling all the pharmacies in the area to find out if our patients are being compliant with medications and weed out those who are not, to provide for those patients who really need our care." – Mississippi Pain Management Specialist
- "We would like to take the time to express our gratitude for all your efforts in the CURES program. This program is wonderful resource tool in tracking our controlled substance prescriptions and aiding in prevention of substance abuse." – California Pain Management Specialist.
- "As an emergency physician, I have found the OARRS program [Ohio's PDMP] extremely useful. I am shocked daily by the number of prescriptions and prescribers that some of my patients possess." - Ohio Physician
- "I appreciate this website greatly!!! As a hospitalist it makes my life much easier to verify drug history and doctor shoppers." – Ohio Physician
- "Instant access to controlled substance history is critical to safe management of patients." – Massachusetts physician[55]

Investigators find PDMPs an invaluable resource.[56]

- "As far as enforcement of the Controlled Substance Act, the Prescription Monitoring Program is one of the best assets we have ever had. The countless hours saved by the agents being able to pull the profile compared to the way agents used to have to go to each pharmacy to get a profile have saved the state large amount of money in salaries and vehicle expense." - Agent, Mississippi Bureau of Narcotics
- "This database is like cell phones and e-mail - what the heck did we do without it?" - Pharmacy Diversion Investigator, Ohio Narcotics Agency

- "... the monitoring system in [Mississippi] has been great. It has helped me identify alleged over prescribing registrants, possible doctor shopping patients, as well as possibly impaired practitioners writing prescriptions for themselves." - DEA Diversion Investigator

- "After receiving a complaint, I can request a report and know in just a few minutes if there is a case to investigate or not… I cannot say enough about KASPER and how valuable it is in my day to day investigations. If you, as an investigator, are not utilizing KASPER, you are limiting your resources and missing valuable information." – K State police officer[57]

****

Note: For inquiries concerning this report, please contact the PDMP Center of Excellence at http://www.pdmpexcellence.org or call 781-736-3909.

Endnotes

[1] Jones, C. M., "Prescription drug abuse and overdose in the United States," presentation for the PDMPs & Third Party Payers Meeting, Washington D.C., December, 2012, convened by the PDMP Center of Excellence. http://www.pdmpexcellence.org/sites/all/pdfs/Jones.pdf

[2] Hansen et al. Economic costs of nonmedical use of prescription opioids. Clinical Journal of Pain, 2:3. March, 2011. www.ncbi.nlm.nih.gov/pubmed/21178601

[3] See the PDMP Center of Excellence page on the prescription drug abuse epidemic at http://www.pdmpexcellence.org/drug-abuse-epidemic

[4] Wang, J. and Christo, P.J., The influence of prescription monitoring programs on chronic pain management. *Pain Physician,* 2009; 12:507-515. http://www.painphysicianjournal.com/2009/may/2009;12;507-515.pdf

[5] Morgan, L., Weaver, M., Sayeed, Z., Orr, R. The use of prescription monitoring programs to reduce opioid diversion and improve patient safety. *Journal of Pain & Palliative Care Pharmacology,* 2012, doi:10.3109/15360288.2012.738288 http://informahealthcare.com/doi/abs/10.3109/15360288.2012.738288

[6] Worley, J. Prescription drug monitoring programs, a response to doctor shopping: purpose, effectiveness, and directions for future research. *Issues in Mental Health Nursing*, 2012, 33:319-328. http://www.ncbi.nlm.nih.gov/pubmed/22545639

[7] Clark, T., Eadie, J., Knue, P., Kreiner, P., Strickler, G. Prescription drug monitoring programs: an assessment of the evidence for best practices. PDMP Center of Excellence. 2012. http://www.pdmpexcellence.org/sites/all/pdfs/Brandeis_PDMP_Report.pdf

[8] Darves, B. "Tracking Rx Misuse: State Programs Making Gains," iHealtBeat, September, 2012. http://www.ihealthbeat.org/features/2012/tracking-rx-misuse-state-programs-making-gains.aspx

[9] Doctor shopping, punishable by law in some states, is commonly understood as an individual's obtaining prescriptions from multiple prescribers and pharmacies without revealing to each prescriber and pharmacy that the others are involved.

[10] Durkin, C. et al., "Cost-Benefit analysis of a prescription drug monitoring program in Wisconsin," LaFollette School of Public Affairs (LaFollette), 6, Dec. 20, 2010. http://cbkb.org/wp-content/uploads/2012/07/Prescription_Drugs_2010.pdf

[11] See the FAQ on PDMPs at the PDMP Training and Technical Assistance website at http://www.pdmpassist.org/content/prescription-drug-monitoring-frequently-asked-questions-faq

[12] Baehren, D. et al., "A statewide prescription monitoring program affects emergency department prescribing behaviors," *Annals of Emergency Medicine*, 2010 Jul; 56(1):19-23. http://www.ncbi.nlm.nih.gov/pubmed/20045578

[13] Feldman, L., Williams, K.S., Coates, J. Influencing controlled substance prescribing: attending and resident physician use of a state prescription monitoring program. Pain Medicine, 2012, 13: 908-914. http://www.ncbi.nlm.nih.gov/pubmed/22681237

[14] Green, T. et al. How does use of prescription monitoring program change medical practice? *Pain Medicine,* 2012. Oct;13(10):1314-23. http://www.ncbi.nlm.nih.gov/pubmed/22845339

[15] Communication from Oklahoma PDMP to PDMP Center of Excellence, January, 2013.

[16] Early Assessment of the Prescription Drug Monitoring Program: A Survey of Providers, Program Design and Evaluation Services, Multnomah County Health Department and Oregon Health Authority, 2013, http://www.orpdmp.com/orpdmpfiles/PDF_Files/Reports/PDES_PDMPeval_01.10.13.pdf

[17] Dormuth, C. R. et al., Effect of a centralized prescription network on inappropriate prescriptions for opioid analgesics and benzodiazepines. *Canadian Medical Association Journal*. 2012. DOI:10.1503 /cmaj.120465. http://www.cmaj.ca/content/184/16/E852.abstract

[18] Alliance of States with Prescription Monitoring Programs, "An Assessment of State Prescription Monitoring Program Effectiveness and Results" Version 1, 11.30.07, http://pdmpexcellence.org/pdfs/alliance_pmp_rpt2_1107.pdf

[19] Kentucky Cabinet for Health and Family Services and Kentucky Injury Prevention and Research Center, 2010 KASPER Satisfaction Survey, http://chfs.ky.gov/NR/rdonlyres/BDC0DFC9-924B-4F11-A10A-5EB17933FDDB/0/2010KASPERSatisfactionSurveyExecutiveSummary.pdf

[20] Lambert, D. Impact evaluation of Maine's prescription drug monitoring program. Muskie School of Public Service, University of Southern Maine: Portland, Maine, March, 2007. http://muskie.usm.maine.edu/Publications/ihp/PrescDrugMonitoringPgrmExecSum.pdf

[21] 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. *Pharmacoepidemiology and Drug Safety, 2009,* 18(1), 36--43. http://www.ncbi.nlm.nih.gov/pubmed/19040199

[22] PDMP Center of Excellence, "Trends in Wyoming PMP prescription history reporting: evidence for a decrease in doctor shopping?" 2010, http://www.pdmpexcellence.org/sites/all/pdfs/NFF_wyoming_rev_11_16_10.pdf

[23] PDMP Center of Excellence, "Nevada's Proactive PMP: The Impact of Unsolicited Reports" October, 2011. http://www.pdmpexcellence.org/sites/all/pdfs/nevada_nff_10_26_11.pdf

[24] Virginia Prescription Monitoring Program. (2010). 2010 Statistics. Retrieved September 11, 2012, from www.dhp.virginia.gov/dhp_programs/pmp/docs/ProgramStats/2010PMPStatsDec2010.pdf

[25] Florida PDMP Annual Report, 2011-2012. http://www.eforcse.com/docs/2012AnnualReport.pdf

[26] Communication from LA PDMP to PDMP Center of Excellence.

[27] P Kreiner of the PDMP Center of Excellence communication to MA PDMP regarding preliminary analysis of baseline survey.

[28] Swedlow, A., and Ireland, J., Estimated savings from enhanced opioid management controls through 3rd party payor access to the Controlled Substance Utilization Review and Evaluation System (CURES). California's Workers' Compensation Institute, January, 2013. Report available at http://www.cwci.org/research.html

[29] Wood, B.C., "Prescription monitoring programs and third party payers." Presentation for the PDMPs and Third Party Payer's Meeting, Washington, D. C., December, 2012, convened by the PDMP Center of Excellence. http://www.pdmpexcellence.org/sites/all/pdfs/Wood.pdf

[30] PDMP Center of Excellence. Using PDMPs to improve medical care: Washington State's data sharing initiative with Medicaid and workers' compensation, January, 2013. Forthcoming at http://www.pdmpexcellence.org/content/notes-field-0

[31] Mahon, W. "Rx for peril: the health insurance impact and risks of epidemic-level prescription drug diversion." Presentation for the PDMPs and Third Party Payer's Meeting, Washington, D. C., December, 2012, convened by the PDMP Center of Excellence. http://www.pdmpexcellence.org/sites/all/pdfs/Mahon.pdf

[32] Best, S. "PMP use by Medicaid." Presentation for the PDMPs and Third Party Payer's Meeting, Washington, D. C., December, 2012, convened by the PDMP Center of Excellence. http://www.pdmpexcellence.org/sites/all/pdfs/Best.pdf

[33] Simeone, R. and Holland, L. "An evaluation of prescription drug monitoring programs," Simeone Associates, Inc., 2006, http://www.simeoneassociates.com/simeone3.pdf. See also "State prescription monitoring programs highly effective," Carnevale Associates, 2007, http://www.pdmpexcellence.org/pdfs/pdmp_info_brief2.pdf

[34] Reisman R.M., Shenoy P.J., Atherly A.J., Flowers C.R. Prescription opioid usage and abuse relationships: An evaluation of state prescription drug monitoring efficacy. *Substance Abuse: Research and Treatment*. 2009;3:41-51. http://www.la-press.com/prescription-opioid-usage-and-abuse-relationships-an-evaluation-of-sta-article-a1442

[35] Eadie, J.L. (1993). New York State triplicate prescription program. In J.R. Cooper, D.J. Czechowicz, S.P. Molinari, & R.C. Petersen (Eds.), Impact of Prescription Drug Diversion Control Systems on Medical Practice and Patient Care: NIDA Research Monograph 131 (pp. 176--193). Rockville, MD: U.S. Department of Health and Human Services, National Institute on Drug Abuse.

[36] Reifler, L.M. et al, Do prescription monitoring programs impact state trends in opioid abuse/misuse?, *Pain Medicine*, 2012 http://onlinelibrary.wiley.com/doi/10.1111/j.1526-4637.2012.01327.x/abstract

[37] Curtis, L.H., Stoddard, J., Radeva, J.I., Hutchison, S., Dans, P.E., Wright, A, Woosley, R.L., Schulman, K.A. Geographic variation in the prescription of schedule II opioid analgesics among outpatients in the United States. *Health Serv Res*. 2006 Jun;41(3 Pt 1):837-55. http://www.ncbi.nlm.nih.gov/pubmed/16704515

[38] Blumenschein, K. et al., "Independent evaluation of the impact and effectiveness of the Kentucky All Schedule Prescription Electronic Reporting Program (KASPER)," 2010, http://www.chfs.ky.gov/NR/rdonlyres/24493B2E-B1A1-4399-89AD-1625953BAD43/0/KASPEREvaluationFinalReport10152010.pdf

[39] Durkin, C. et al., "Cost-Benefit analysis of a prescription drug monitoring program in Wisconsin," LaFollette School of Public Affairs (LaFollette), 6, Dec. 20, 2010. http://cbkb.org/wp-content/uploads/2012/07/Prescription_Drugs_2010.pdf

[40] Kentucky Cabinet for Health and Family Services and Kentucky Injury Prevention and Research Center, 2010 KASPER Satisfaction Survey, http://chfs.ky.gov/NR/rdonlyres/BDC0DFC9-924B-4F11-A10A-5EB17933FDDB/0/2010KASPERSatisfactionSurveyExecutiveSummary.pdf

[41] Virginia Department of Health Professions (VDHP) and Virginia State Police (VSP). Prescription monitoring program: Report of the Virginia Department of Health Professions and Virginia State Police. VDHP and VSP: Richmond, VA, 2004. http://www.dhp.virginia.gov/dhp_programs/pmp/docs/REPORT%20OF%20THE%20PMP.pdf

[42] GAO Report GAO-02-634: "Prescription drugs. State monitoring programs provide useful tool to reduce diversion," 2002, http://www.gao.gov/new.items/d02634.pdf

[43] PDMP Center of Excellence. Perspective from Kentucky: using PMP data in drug diversion investigations. May, 2011. http://www.PDMPexcellence.org/sites/all/pdfs/NFF_kentucky_5_17_11_c.pdf

[44] PDMP Center of Excellence. Staying clear of the law and addiction: Nevada's pre-criminal intervention program. January, 2011. http://www.PDMPexcellence.org/sites/all/pdfs/2_nevada_pcip_nff_1_19_11.docx

[45] PDMP Center of Excellence. Monitoring and changing behavior: the role of PMP data in Kentucky drug courts. August, 2011. http://www.PDMPexcellence.org/sites/all/pdfs/KY_Drug_Court_NFF_8_30_11.pdf

[46] Communication from Maine PDMP to PDMP Center of Excellence.

[47] PDMP Center of Excellence. Keeping patients safe: a case study on using prescription monitoring program data in an outpatient addictions treatment setting. March, 2011. http://www.PDMPexcellence.org/sites/all/pdfs/methadone_treatment_nff_%203_2_11.pdf

[48] Letter to colleagues from H. Westley Clark, Director, Substance Abuse and Mental Health Services Administration, September 27, 2011. http://dpt.samhsa.gov/pdf/pmp_otp_2011_letter.pdf

[49] PDMP Center of Excellence. Drug related deaths in Virginia: medical examiner use of PMP data. December, 2011. http://www.PDMPexcellence.org/sites/all/pdfs/va_med_examiner_NFF_12_9_11_rev.pdf

[50] PDMP Center of Excellence. Project Lazarus: using PDMP data to mobilize and measure community drug abuse prevention. June, 2012. http://www.pdmpexcellence.org/sites/all/pdfs/project_lazarus_nff_a.pdf

[51] "The prescription drug abuse epidemic and prevention: how prescription monitoring programs can help," PDMP Center of Excellence webinar presentation for the Center for the Application of Substance Abuse Technologies, http://www.PDMPexcellence.org/sites/all/pdfs/pmp_subst_abuse_prevent_web_09_23_10.pdf

[52] Carnevale & Associates and PDMP Center of Excellence. Prescription monitoring and prevention: recommendations for increased collaboration. Working paper produced for the Substance Abuse and Mental Health Services Administration. December 3, 2010.

[53] PDMP Center of Excellence. Surgeon General's Expert Panel on Prescription Drug Abuse in Youth: Prescription Monitoring Program Roles. Presentation for U.S. Department of Health & Human Services. Washington, DC. March, 2011 http://PDMPexcellence.org/sites/all/pdfs/SurgeonGeneralExpertPanel_2011_03_29.pdf

[54] Alliance of States with Prescription Monitoring Programs, op. cit.

[55] Communication from MA PDMP to PDMP Center of Excellence.

[56] Alliance of States with Prescription Monitoring Programs, op. cit.

[57] Text of remarks regarding Kentucky All Schedule Electronic Reporting (KASPER) System from video made in Kentucky, August 2005, http://www.PDMPexcellence.org/sites/all/pdfs/kasper_video_trans_marshall_2005_08_a.pdf