Methamphetamine: The Resurgence of Manufacturing After Oklahoma House Bill 2176

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Methamphetamine manufacturing began to flourish in Oklahoma during the 1990s. In a span of less than ten years, reported methamphetamine laboratory seizures increased from ten to over 1,200 per year (Oklahoma Bureau of Narcotics and Dangerous Drugs [OBNDD], 2011a). This increase caused great concern for local law enforcement officials due to the significant dangers, volatility, and toxicity of clandestine laboratories. Clandestine laboratories were related to numerous problems, including explosions and fires, environmental contamination, and residual toxic waste products, posing serious risks to first responders and local communities (Scott & Dedel, 2006).

The response to the emerging problem was multifaceted and included the passage of numerous laws aimed at curtailing the manufacturing problem (see Shukla & Bartgis, 2010). The most significant of these, Oklahoma House Bill (OK HB) 2176, placed quantity limitations and strict restrictions on access to over-the-counter cold medicines and products containing pseudoephedrine, a key precursor chemical being used to manufacture methamphetamine in the state (OK HB 2176, 2004a, 2004b, 2004c). The impact on laboratory seizures was noteworthy. The number of reported laboratory seizures dropped from over 1,200 per year in 2003, to 334 in 2005, to fewer than 200 seizures by 2006 (OBNDD, 2011a, 2011b). The legislation was credited with making a significant impact on the reduction of the clandestine manufacturing of methamphetamine (Henry, 2005; Office of National Drug Control Policy [ONDCP], 2006a; Shukla & Bartgis, 2008, 2010). While much of the attention on the impact of OK HB 2176 focused on the observed reductions in laboratory seizures, the methamphetamine problem persisted.

The present case study describes changes in Oklahoma's methamphetamine problem in the years after the implementation of OK HB 2176. This study contributes to what is known of the effects of legislatively implemented precursor controls at the local level by focusing on the experience of a single state and documenting the perspectives of local law enforcement. Although primarily descriptive in nature, the present study provides insight into how local illicit drug problems evolve and change in response to efforts to control them. Additionally, information on the recent resurgence of clandestine manufacturing in Oklahoma and broader shifts in the methamphetamine problem will be discussed. By providing an in-depth description of the evolution of the methamphetamine problem, this study sheds light on the limitations of supply-focused enforcement strategies and the adaptability of motivated offenders.

The Methamphetamine Problem

The methamphetamine problem is one of the most serious drug problems in Oklahoma (Drug Enforcement Administration [DEA], 2004, 2006, 2007, 2008). Concern over the methamphetamine problem is increasing both within the U.S. (Hunt, Kuck, & Truitt, 2006; Maxwell & Rutkowski, 2008; ONDCP, 2006a; Pennell, Ellett, Rienick, & Grimes, 1999; Sommers & Baskin, 2004) and internationally (Australian Parliament, 2007; Diplock, Kirkland, Malm, & Plecas, 2005; Dye, 2006; National Drug Intelligence Center [NDIC], 2005). Methamphetamine is the most widely consumed synthetic stimulant in the world (European Monitoring Centre for Drugs and Drug Addiction & Europol, 2009).

There is a growing recognition that the methamphetamine problem is unique and different from other illicit drug problems (see Hunt, 2006; Pennell et al., 1999). The significance of the methamphetamine problem as an issue that deserves individualized consideration is demonstrated by the annual publication of the *National Methamphetamine Threat Assessment* (NDIC, 2006, 2007, 2008). The multidimensional nature of the methamphetamine problem makes responding to the problem particularly challenging.

Methamphetamine users experience potent stimulant effects that can last for hours or days. Heavy methamphetamine users may go on binges, staying up for days on end, increasing the potential for meth psychosis. Long-term use of methamphetamine can result in serious, negative consequences, including physical deterioration, psychosis, and aggression (National Institute on Drug Abuse [NIDA], 2006, 2010). The demand for methamphetamine fuels the manufacturing and trafficking components of the problem.

Methamphetamine is completely synthetically manufactured (Hunt, 2006) in higher quantity-producing super-labs (Scott & Dedel, 2006), and in smaller, more regional "mom-and-pop" labs (Hunt, 2006; Scott & Dedel, 2006) or small toxic laboratories (STLs) (Hunt et al., 2006; O'Connor et al., 2007). In Oklahoma and various other states, it is the smaller mom-and-pop labs that present significant problems due to their volatility, toxicity, and dangerousness (Scott & Dedel, 2006). Increasingly, methamphetamine is being distributed through illicit drug trafficking networks operating within the U.S. and internationally**.** With methamphetamine, trafficking may involve the finished methamphetamine product as well as the trafficking of the regulated precursor chemicals used to manufacture methamphetamine (United Nations Office on Drugs and Crime [UNODC], 2008). Identifying a comprehensive response capable of addressing each component of the problem is difficult at best.

Responding to Clandestine Manufacturing

In the U.S., responding to the clandestine manufacturing of methamphetamine took priority at both the state and federal levels. This proved extremely problematic because of the availability of all of the essential ingredients, precursor chemicals, and supplies needed to manufacture the drug (*Emerging Threats*, 2001; Scott & Dedel, 2006). Those who were motivated to manufacture methamphetamine could learn the process from others (Jenkot, 2008; Pennell et al., 1999), via the Internet (Hunt et al., 2006; Scott & Dedel, 2006), or elsewhere (e.g., see Pennell et al., 1999; Uncle Fester, 2008, 2009). Legislative responses focused on increasing controls on precursor

chemicals and enhancing penalties for offenders. Over a period of years, numerous state and federal laws were passed to address various facets of the manufacturing problem. The fact that the majority of state precursor laws in effect in 2005 had been enacted since 2001 (O'Connor et al., 2007) demonstrates the urgency with which states responded to the manufacturing problem.

Evaluating Legislative Precursor Controls

Research on the impact of legislative controls aimed at controlling precursor chemicals for methamphetamine demonstrates mixed findings with regard to the effectives of such efforts. In a study of the impact of federal regulations of pseudoephedrine and ephedrine on hospital admissions, Cunningham and Liu (2003) found substantial reductions in methamphetamine-related hospital admissions to be associated with regulations of chemicals used by large-scale producers versus small-scale producers. The authors reiterated the need for a comprehensive response focused on both aspects of the problem: supply and demand. In another study, Dobkin and Nicosia (2009) examined the impact of the Domestic Chemical Diversion Control Law on diverse indicators of the methamphetamine problem in California. While Dobkin and Nicosia found that the methamphetamine market was disrupted, and increases in usage were interrupted following enforcement efforts resulting from the law, such disruptions were found to be temporary. In one of the most comprehensive studies on methamphetamine laboratory seizures, Weisheit and Wells (2010) documented the short-term effects of legislative precursor controls using national level data, finding that while laboratory seizures declined following the passage of legislative precursor controls, even strict controls did not eliminate the production problem.

In one of the few studies to examine methamphetamine users and producers' reactions to legislative controls on pseudoephedrine-containing products, Sexton, Carlson, Leukefeld, and Booth (2008) also found mixed results in terms of perceptions about the effectiveness of precursor controls. While pseudoephedrine became less available and local manufacturing declined after the precursor laws went into effect, the laws did not eliminate the supply of methamphetamine or pseudoephedrine. Rather, the controls led to an increased black market for pseudoephedrine, adaptations in how ephedrine and pseudoephedrine were obtained, and an increase in imported methamphetamine (Sexton et al., 2008). While the findings from this study are limited due to the small sample size that is geographically restricted to two rural states (i.e., Arkansas and Kentucky), they provide additional evidence of how the problem changed in response to the implemented controls.

In an evaluation of precursor laws and STL seizures, McBride, Terry-McElrath, Chriqui, O'Connor, and VanderWaal (2008) sought to separately examine the effects of state and federal laws on STL seizures. Their findings indicated that no simple approach to the domestic production of methamphetamine exists. Further, the research found that while some types of provisions are more successful at reducing STLs than others, a comprehensive policy approach is warranted. In a related study, VanderWaal et al. (2008) examined perceptions about precursor policies related to ephedrine and pseudoephedrine. Data were collected through interviews with key informants and focus groups in Indiana, Kentucky, Missouri, Oklahoma, and Oregon. The researchers concluded that there was consistent agreement across key informants and focus groups in all states that implemented

precursor laws that legislation had greatly reduced the harm caused by STLs in their states. While the evaluations appear positive toward the reduction of harm caused by STLs, historical evidence indicates a possible trend toward resurgence of laboratories as manufacturers find ways around restrictions.

Oklahoma's Experience

Oklahoma's experience with the regulation of ephedrine has been cited as an example of how states serve "as laboratories for drug policy" (Weisheit & White, 2009, p. 127). Oklahoma was among the first states in the nation to pass strict precursor controls limiting over-the-counter access to products containing pseudoephedrine (OK HB 2176, 2004a, 2004b, 2004c; ONDCP, 2006b). According to the ONDCP (2006b), OK HB 2176 "was the first of its kind in the nation" (p. 40); the controls were modeled federally as part of the reauthorization of the U.S.A. Patriot Act in 2006. Additionally, Oklahoma was among the first states to implement a real-time, electronic monitoring and tracking system in place for enforcing the precursor controls set in place by OK HB 2176 (see ONDCP, 2006b; Shukla & Bartgis, 2010).

Oklahoma's responses to methamphetamine proved influential. In the two-year period following the enactment of OK HB 2176, 41 other states had legislated similar restrictions on ephedrine and pseudoephedrine (Weisheit & White, 2009). While the legislative precursor controls that were implemented vary from one another (O'Connor et al., 2007; ONDCP, 2006a), such variations reflected local and regional differences in the problem and diverse views on appropriate responses (see O'Connor et al., 2007). In hearings before Congress in 2005 and 2006, Oklahoma's efforts to control manufacturing through precursor controls and the need for an evaluation of these efforts were discussed (see *Fighting Meth*, 2005; *International Methamphetamine*, 2006). The Combat Methamphetamine Epidemic Act of 2005 was modeled in part after OK HB 2176, placing controls and limitations on access to products containing pseudoephedrine. More recently, the Methamphetamine Production Prevention Act of 2008, which seeks to facilitate the creation of electronic logbook systems to monitor and track the sales of methamphetamine precursors (*Policy and Legislation*, n.d.), models the electronic logbook requirements enacted through OK HB 1507 in 2005 and implemented statewide by OBNDD in 2006 (OBNDD, 2006; Shukla & Bartgis, 2010).

While the research on precursor controls provides useful information on the effects and limitations of such controls, there is a need for understanding how such policies impact the methamphetamine problem at the local level. The present study attempts to assess changes in the methamphetamine problem by capturing the perspective of law enforcement officials in a single state (i.e., Oklahoma) and describing changes in Oklahoma's methamphetamine problem in the years following the enactment of precursor controls. Specifically, this research seeks to answer the following questions: "What impact did OK HB 2176 have on the methamphetamine problem in Oklahoma according to local law enforcement in the state?" and "How has the methamphetamine problem changed in recent years?" This information is essential for developing a grounded understanding of how drug problems evolve and change at the local level.

Methods

The data presented here were collected as part of a multi-year study on the methamphetamine problem in Oklahoma.[1] Both primary and secondary data sources were utilized. Institutional Review Board (IRB) approval for this project was obtained from the University of Central Oklahoma (UCO) in 2007, with continuing approval annually through 2011. This research was supported by funding from the UCO Office of Research and Grants and from the College of Liberal Arts.

Primary data were obtained through the Oklahoma Methamphetamine Survey. The survey instrument, which was designed specifically for this study, consisted of over 40 questions aimed at measuring law enforcement perspectives on a range of topics, including the current state of the methamphetamine problem, changes in the methamphetamine problem (i.e., use, trafficking, and manufacturing) in recent years, and perceptions of the impact of Oklahoma House Bill 2176. Closed-ended, matrix, contingency, and open-ended questions were utilized in the questionnaire.

Surveys were mailed to each law enforcement agency in Oklahoma. The sample mailing list was developed using compiled lists of all Oklahoma law enforcement agencies obtained from the Oklahoma Council on Law Enforcement Education and Training (CLEET) and the Oklahoma Association of Chiefs of Police. The sample included local police departments, county sheriff's departments, tribal police departments, drug task forces, and Oklahoma Highway Patrol offices.

The mail surveys were initially sent to each of the 483 agencies in the fall of 2007.[2] One survey packet was mailed to each agency. Each survey packet included the following: a short letter of support from Oklahoma Attorney General W. A. Drew Edmondson; a one-page letter of support encouraging departments to participate from the state drug enforcement agency, the Oklahoma Bureau of Narcotics and Dangerous Drugs (OBNDD); a copy of the mail survey; and a self-addressed, stamped envelope. Each survey packet was addressed to the chief or administrator of the agency. A follow-up postcard and a second mailing were sent out to all nonrespondents in the spring of 2008. The data were analyzed using *Excel*, *SPSS*, and *AskSam*. The law enforcement data presented here are limited. A single survey was sent to each law enforcement agency. The data presented here represent the views of those who completed the survey. In some cases, the views of the survey respondent may differ from others within a specific agency. Further, the findings are based on the 40% of law enforcement agencies that responded to the survey.

Information on recent changes in the clandestine manufacturing problem was obtained from both primary and secondary data sources. The main author communicated with the public information officer (i.e., Mr. Mark Woodward) of the OBNDD through e-mails and an in-person interview. Information from numerous secondary sources, including media, academic, and governmental reports, was also reviewed. Data on the numbers of clandestine methamphetamine laboratory seizures in Oklahoma were compiled from OBNDD (2011a, 2011b) reports and from the DEA's (n.d.) National Clandestine Laboratory Database. The number of laboratory seizures from these two sources vary from one another and are subject to change over time (i.e., as data is updated), making it difficult to obtain reliable estimates of the number of clandestine laboratories.

Findings

Oklahoma Methamphetamine Survey: Results

Forty percent of departments (N = 195)[3] responded to the survey. As demonstrated by Figure 1,[4] responses were received from agencies in 72 of the 77 counties in Oklahoma. The majority of responses came from police departments (*n* = 136; 69.7%) and sheriff's offices (*n* = 41; 21%). Responses were also received from Oklahoma Highway Patrol troops (*n* = 9; 4.6%), tribal police departments (*n* = 6; 3%), and drug task forces (*n* = 3; 1.5%). While survey respondents included individuals from several types of positions within the police department (e.g., Assistant Chiefs, Captains, Lieutenants, Sergeants, Detectives, Special Agents, and Narcotics Officers), the majority of respondents (41%) were Police Chiefs.

The law enforcement data provides insight into the types of changes that followed the implementation of Oklahoma House Bill (OK HB) 2176 in 2004. With regard to the local drug problem in general, the majority of respondents (67.2%) indicated that the drug problem in their jurisdictions changed from 2004 to 2007. For the methamphetamine problem specifically, an overwhelming majority of agencies (76.9%) reported that the local methamphetamine problem in their jurisdiction changed after the passage of OK HB 2176.

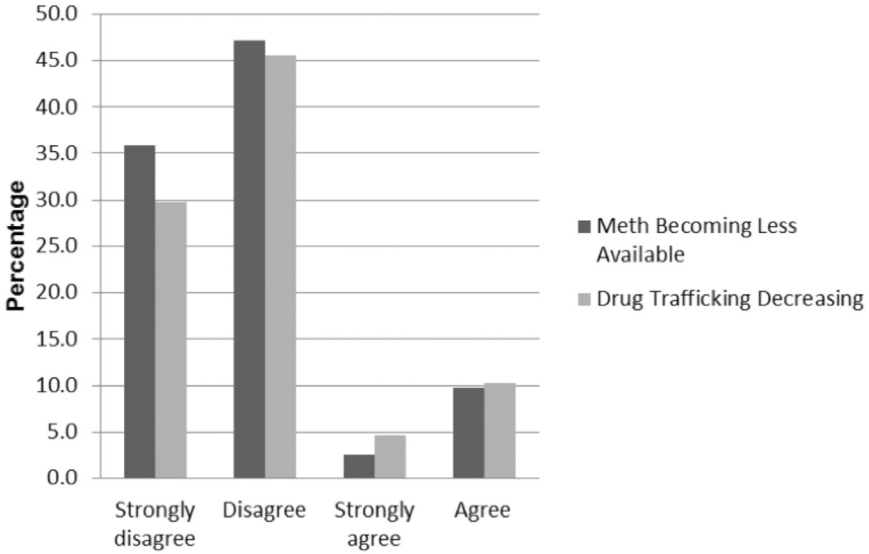
Respondents provided information on their perceptions about the changes in the methamphetamine problem in their jurisdictions (see Figure 1). While it is not surprising that the survey data supports the observed decline in laboratory seizures (see Table 1), the responses from law enforcement capture differences that may exist at the local level. According to the survey results, the majority of respondents (66.1%) indicated that methamphetamine manufacturing was declining, small, or not a problem. While this is noteworthy, it is important to point out that 22.1% of agencies (*n* = 42) reported that manufacturing continued to be a sizable or major problem in their jurisdictions.

The survey responses highlight the limitations of precursor controls on the larger methamphetamine problem. While local manufacturing declined, the data support the persistence of the larger methamphetamine use problem in the years after OK HB 2176 was enacted. Of responding agencies, 78.4% reported that methamphetamine use is sizable to major and is a growing problem in their jurisdiction. Not surprisingly, the ongoing demand did not go unfulfilled. As the data indicate, the decline in local manufacturing seemed to correspond with an increase in the trafficking of methamphetamine. A majority (63.6%) of agencies report that the trafficking of methamphetamine is sizable to major and is a growing problem within their jurisdiction. Only 26.1% of agencies report methamphetamine trafficking to be a small problem.

The majority of respondents (*n* = 193) provided some qualitative responses to the open-ended questions contained in the survey. While most of these responses were relatively brief (i.e., a few words or sentences), the qualitative data provided additional information necessary for understanding changes in the problem occurring at the local level. When asked whether offenders were finding new ways to obtain precursor chemicals to manufacture methamphetamine since the passage of OK HB 2176, 62.6% (*n* = 122) of respondents answered *yes*. The majority of these respondents (*n* = 117) provided additional, albeit brief, qualitative information on the ways offenders were

circumventing the precursor controls enacted in 2004. According to the respondents, offenders were now obtaining precursors through various methods, including obtaining pseudoephedrine from other states, through mail order or Internet purchases, having multiple persons purchase pseudoephedrine, going to multiple locations or using fake IDs to purchase pseudoephedrine, trading methamphetamine for pseudoephedrine, burglarizing pharmacies, and by obtaining it on the black market.

Figure 1. Survey Responses on Availability of Methamphetamine Drug Trafficking (N = 195)



Note: Based on 195 survey respondents

A majority of respondents (84.6%) expressed that they did not have enough resources to handle the local drug problem they faced in their jurisdictions. The focus on the observed reduction in clandestine laboratory seizures masks the frustration experienced by local law enforcement who work on the front lines of this drug war, witnessing crime and drug problems firsthand. With regard to methamphetamine specifically, 82.1% indicated that they did not have enough resources to deal with the problem in their jurisdiction. Some of the most telling information on lack of resources and resulting frustration was provided by respondents from the qualitative comments written in to the survey by respondents. As the Chief of a rural police department wrote,

> The smaller law enforcement agencies have a hard time trying to conduct undercover narcotic investigations. Our resources are limited and the known traffickers know the members of the department. Outside assistance from state and federal law enforcement would be greatly appreciated. We would be willing to share any and all information with an outside agency in an effort to reduce illegal drug activity.

Table 1. Characterization: Methamphetamine Manufacturing, Trafficking, and Use Is a Problem

	Manufacturing Frequency	Percent	Valid Percent	Trafficking Frequency	Percent	Valid Percent	Use Frequency	Percent	Valid Percent
Not a problem at all	16	8.2	8.4	5	2.6	2.6	0	0.0	0.0
A declining problem	55	28.2	28.9	9	4.6	4.8	5	2.6	2.6
A small problem	58	29.7	30.5	32	16.4	16.9	22	11.3	11.3
A small but growing problem	19	9.7	10.0	19	9.7	10.1	12	6.2	6.2
A sizable problem	27	13.8	14.2	48	24.6	25.4	48	24.6	24.6
A sizable and growing problem	8	4.1	4.2	30	15.4	15.9	27	13.8	13.8
A major problem	5	2.6	2.6	26	13.3	13.8	42	21.5	21.5
A major and growing problem	2	1.0	1.1	20	10.3	10.6	36	18.5	18.5
Total	190	97.3		189	96.9		192		
Missing	5	2.6		6	3.1		3	1.5	1.5
Total percent	100.0	100.0	99.9	100.0	100.0	100.1	100.0	100.0	100.0
Total N	195			195			195		

Note: Oklahoma Methamphetamine Survey responses (N = 195); totals may not add up to 100% due to rounding.

An Assistant Chief of a rural police department shed light on the specific challenges faced by smaller departments, noting, "We are a small department with budget problems. We currently have no officer trained to handle drug labs." Rural police departments face additional challenges; manufacturing can be more easily hidden or located to evade detection in more rural areas in the state. Another rural Chief explained, "the major problem in this community is that the meth is manufactured in the county or surrounding counties and then transported into this area." One of the most descriptive and insightful responses came from a rural Police Chief who returned the survey uncompleted with a single-page letter describing his frustration with the drug problem and his reasoning for not wanting to participate in the survey.[4] He emphasized the seriousness of the drug problem in his jurisdiction and the frustrations of rural policing:

> While your research may be of benefit to someone, the time it would take for me to complete the survey would be time completely wasted. I have filled out surveys in the past, participated in State surveys, but nothing changes. I have a very serious drug problem in my rural area, but I can get no real help. All the monies marked for fighting drugs goes to either large agencies or to sheriff's departments. None comes to the average police department. The drug investigators with the [names county] DA's task force have not made contact with my agency in the [specified number] years I have been here. The [names county] sheriff's department drug investigators have not been in contact with my agency in the [specified number] years I have been here. The statement was made that there are no drugs in [names county]. . . . I have never seen a penny from any grants earmarked to combat the drug problem. Because of a very limited budget, when I lost an officer, I have not been able to fill that position. I am working with one full-time officer, me, and a couple of part-time officers. I am forced to fight this battle alone, with no additional resources or help from anyone. So to me, your survey is not worth the effort.

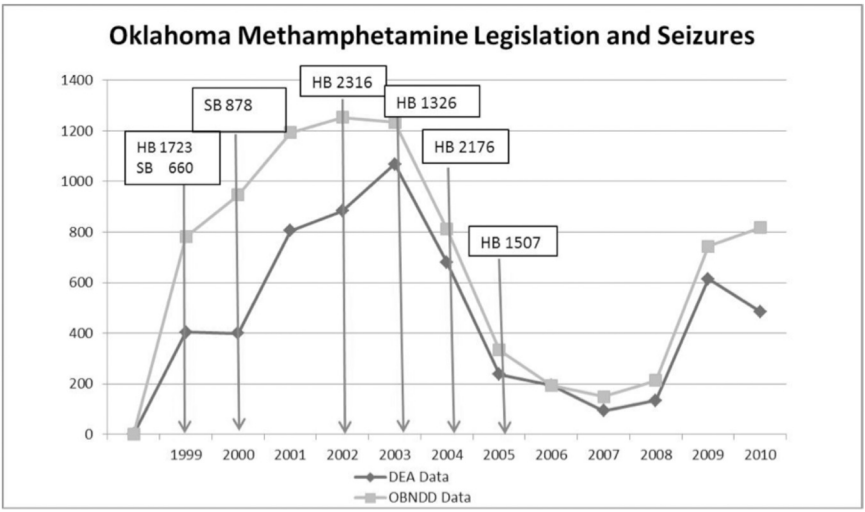
This single, qualitative response provided the most extensive detail about the challenges of responding to the methamphetamine problem at the local level, helping to put the quantitative data provided into context. On the basis of the data provided, Oklahoma law enforcement were aware that the methamphetamine problem continued despite the observed reductions in local manufacturing, providing insight into the types of changes that were occurring.

The Resurgence of Manufacturing

While methamphetamine manufacturing declined in the years after the implementation of OK HB 2176, clandestine laboratories were never completely eliminated. Even with the strict restrictions on precursor chemicals, there were offenders who continued to make methamphetamine based on the laboratory seizures reported to OBNDD. The observed reduction in numbers of seizures, however, was significant and important in terms of the potential impact on local communities and costs of responding to laboratories. In recent years, however, reported laboratory seizures are increasing in number and local manufacturing is changing. Seven years after the implementation of OK HB 2176, methamphetamine manufacturing is resurging (see Figure 2) in parts of the state according to both state (i.e., OBNDD) and federal (i.e., DEA) level laboratory counts (see Table 2). It is important to note that while these numbers differ from one another and are

subject to change over time, they follow a similar trend overall. According to the most recent state-level data on reported laboratory seizures in Oklahoma, in 2008, a total of 213 methamphetamine laboratories were seized in the state. This number increased to 743 in 2009 and 818 in 2010 (OBNDD, 2011a). OBNDD reports that the increase in methamphetamine laboratories that began in 2008 resulted primarily from the "one pot" or "shake-n-bake" methods of manufacturing that required smaller quantities of pseudoephedrine (OBNDD, 2011b).

Figure 2. Oklahoma Methamphetamine Legislation and Methamphetamine Laboratory Seizures, 1999 to 2010[5]



Note: This figure is reprinted from Shukla and Bartgis (2010); it has been revised to include the most recent data on laboratory seizure numbers. The figure includes specific pieces of legislation related to methamphetamine passed between 1999 and 2005 (see Oklahoma House Bill [OK HB] 1723, 1999; OK HB 2316, 2002; OK HB 1326, 2003; OK HB 2176, 2004a, 2004b, 2004c; OK HB 1507, 2005; Oklahoma Senate Bill [OK SB] 660, 1999; OK SB 878, 2000).

Adapted from Oklahoma Statutes (OK HB 1723, 1999; OK SB 660, 1999; OK SB 878, 2000; OK HB 2316, 2002; OK HB 1326, 2003; OK HB 2176, 2004a, 2004b, 2004c; OK HB 1507, 2005).

Reports about the new, revised one pot or shake-n-bake methods of manufacturing methamphetamine began emerging after controls on pseudoephedrine and ephedrine were enacted. With this new, revised manufacturing process, small amounts of methamphetamine can be produced in a 20-ounce or two-liter bottle with only a few key ingredients, including pseudoephedrine, lithium strips (i.e., from lithium batteries), and anhydrous ammonia (i.e., from cold packs). This manufacturing process involves a variation of the lithium ammonia method of production. With this process, methamphetamine can be produced in approximately 30 minutes by shaking or mixing ingredients in a plastic bottle (NDIC, 2008). While this method results in very small quantities of methamphetamine, the process is volatile and potentially explosive, and discarded bottles may hold flammable and

toxic chemical residue (NDIC, 2008). Media reports about this new manufacturing process began to emerge in 2009 (The Associated Press, 2009a, 2009b, 2009c; Johnson, 2009). This trend, however, was evident to some of the officers who responded to the Oklahoma survey. As a sheriff of a small town noted in his survey response back in 2007, "the new law [OK HB 2176] was instrumental in eliminating drug labs . . . the ones that we discover now are so small in nature that they can only produce individual use." Given the evolution of methamphetamine manufacturing processes over time (see Weisheit, 2008), the shift in manufacturing processes after the recent controls on pseudoephedrine should not be unexpected. It is not surprising that motivated offenders would adapt to the tighter controls on pseudoephedrine and find other ways to make methamphetamine.

Federal drug assessments shed light on broader shifts in the methamphetamine problem that followed precursor controls in the U.S. In the years following the enactment of precursor controls, methamphetamine was increasingly being transported into the United States from Mexico (DEA, 2006, 2007, 2008; NDIC, 2006, 2007). The U.S. methamphetamine market experienced a significant disruption in 2007 (ONDCP, 2007), and methamphetamine availability decreased in some regions of the country in 2007 and 2008 (NDIC, 2008). This disruption resulted from increased restrictions on pseudoephedrine and ephedrine in Mexico and reductions in clandestine manufacturing in the U.S. (NDIC, 2008; ONDCP, 2007). There is growing evidence, however, that these trends are changing. According to the *2009 National Methamphetamine Threat Assessment*, the availability of methamphetamine "stabilized and possibly increased" (NDIC, 2008, p. 1) in 2008 because of increases in the domestic production of methamphetamine. Precursor control circumvention and diversion of ephedrine and pseudoephedrine from licit sources are contributing to this trend (NDIC, 2008). Similarly, according to the *2010 National Drug Threat Assessment*, domestic manufacturing in the U.S. is once again on the rise, with lab incidents increasing at a significant rate in the South and Midwest as of 2009 (NDIC, 2010). The re-emergence of domestic production and higher production rates in Mexico are resulting in an increase in the availability of methamphetamine in the U.S. This trend appears to be part of a larger shift in the availability of illicit drugs in the U.S. (see NDIC, 2010).

There is also evidence of changes in the methamphetamine market on a global scale and potential links between local supplies via manufacturing and broader illicit trafficking. In their *2008 World Drug Report*, the United Nations Office on Drugs and Crime (UNODC) summarized the interrelationship between changes in local production and illicit trafficking:

> The contraction in US domestic manufacture, for example, is being offset by manufacture from Mexico and to some degree Canada. This type of development probably implies that larger and more organized international groups are becoming involved in the trade in some areas. Distribution networks are thought to be replacing independent dealers in some market areas. (p. 123)

The report further provided evidence that the global illicit manufacturing problem primarily involves methamphetamine, finding that nearly every amphetamine-type stimulant (ATS) laboratory being detected worldwide was involved with the production of methamphetamine.

Table 2. Number of Oklahoma Methamphetamine Laboratory Seizures Reported by Oklahoma Bureau of Narcotics and Dangerous Drugs, 1994-2009, and Number of Reported Seizures Reported by DEA, 1999-2008

Year	OBNDD	DEA
1994	10	--
1995	34	--
1996	125	--
1997	241	--
1998	287	--
1999	781[a]	404[b, c]
2000	946	399
2001	1,193	806
2002	1,254	883
2003	1,233	1,068
2004	812	679[d]
2005	334	237
2006	194	194
2007	148	93
2008	213	134
2009	743	614
2010	818	485

[a]Oklahoma law requiring reporting of laboratory seizures was passed.

[b]DEA Clandestine Laboratory Database established.

[c]Data on lab seizure numbers from 1999 through 2003 were retrieved on June 15, 2010.

[d]Revised numbers for Oklahoma lab seizures for years 2004 through 2011 were retrieved on June 30, 2011.

Note: This table is reprinted from Shukla and Bartgis (2010); it has been revised to include the most recent numbers of laboratory seizures. Values represent number of laboratory seizures as reported by each agency. The data in column one are from OBNDD (2011a), and the data in column two were adapted from DEA (n.d.).

Discussion

Oklahoma House Bill 2176 had a significant impact on reducing the number of clandestine methamphetamine laboratory seizures in the state. By design, the law focused on making the manufacturing of methamphetamine more difficult; it did not address the use or trafficking components of the methamphetamine problem. The observed reduction in clandestine laboratories that followed demonstrated the value of the opportunity reduction approach enacted through the strict precursor controls. However, the broader methamphetamine problem that plagued the state remained. As the law enforcement survey results in this study demonstrate, in the three-year period after the passage of OK HB 2176, methamphetamine continued to be a serious problem. In essence, the problem simply changed. While the numbers of clandestine laboratories declined, this reduction was to some degree offset by increases in trafficking. Further, the controls failed to address the primary underlying demand for methamphetamine that had fueled the clandestine manufacturing problem. According to local law enforcement, the use component of the methamphetamine problem persisted. The findings from the Oklahoma Methamphetamine Survey captured the changes occurring in the methamphetamine problem within three years after the legislation was implemented. In essence, the methamphetamine problem persisted and was changing in response to legislative precursor controls.

The recent increase in clandestine laboratory seizures utilizing the revised one pot or shake-n-bake manufacturing process is demonstrative of offender adaptation (Clarke & Eck, 2005). Those who were motivated to continue their manufacturing activities adapted their cooking methods to circumvent the quantity restrictions imposed by OK HB 2176. With this new manufacturing process, offenders were able to manufacture methamphetamine using much lower quantities of pseudoephedrine. These smaller laboratories produced much smaller quantities of methamphetamine than the former types of small labs did (i.e., mom-and-pop laboratories or STLs). While these labs are still very dangerous, volatile, and toxic, given the lower quantities of methamphetamine being produced, there is less potential for distribution into the methamphetamine market.

While there is clearly a recent rise in the number of laboratory seizures, one must interpret these numbers with caution. It is likely that numbers of reported seizures underrepresent the actual level of activity taking place as many manufacturers may be evading detection, and underreporting concerns remain as well. Further, the smaller size and structure of these labs may make them more difficult to detect.

As this case study of Oklahoma's methamphetamine problem and responses to the problem demonstrates, crime control efforts focused on supply reduction are destined to be ineffective for solving multidimensional crime and illicit drug problems. In the face of an ongoing demand for methamphetamine, illicit drug traffickers were more than willing to provide a supply of methamphetamine to meet the continued demand for the drug. The fact that the majority of survey respondents found that methamphetamine trafficking had become a sizable and growing problem at the local level provides strong evidence of the dynamic nature of illicit drug markets. Local manufacturers who could no longer access sufficient quantities of necessary precursor chemicals stopped manufacturing or went underground and remained undetected. In response, Mexican drug trafficking organizations (DTOs) stepped in to maintain the supply and fulfill the continued demand for the drug. These shifts and the continuing methamphetamine problem that plagues local communities are evident in the frustration expressed by Oklahoma law enforcement through their survey responses.

The findings from the present study lend further support to national assessments of precursor controls and ongoing changes in the U.S. methamphetamine problem. There is growing evidence that precursor controls resulted in reductions in STLs in various parts of the country (McBride et al., 2008; ONDCP, 2006b; VanderWaal et al., 2008), demonstrating the positive impact of state and federal precursor laws aimed at stopping clandestine manufacturing, at least on a short-term basis. The more recent increase in laboratories and shifts in manufacturing are demonstrative of the evolving and ever-changing nature of illicit drug problems, and of the limitations of precursor control efforts.

This analysis demonstrates the challenges involved in effectively responding to crime problems that are multidimensional in nature, such as the methamphetamine problem, and provides further evidence in support of the adaptability of drug markets at different levels. The illicit drug market involves an interrelationship between supply and demand. The demand for illicit drugs drives efforts to supply drugs. However, the supply can also impact demand in terms of an ongoing supply, providing opportunities for new users to develop a demand. Manufacturing and trafficking represent the two primary means through which methamphetamine

is supplied in Oklahoma. Each of these components may be viewed in terms of both larger-scale national and international, and smaller-scale local perspectives. The supply of methamphetamine in Oklahoma is maintained by both large-scale DTOs and lower-level manufacturers. Different levels of distribution and manufacturing exist. The interconnection and interrelationship between these diverse facets of production and supply need to be taken into consideration and better understood.

The methamphetamine problem serves as an example of the challenges that are inherent in effectively responding to multidimensional crime problems. In Oklahoma specifically, the domestic production of methamphetamine decreased for a period of time only to resume more recently. As demonstrated by the data from Oklahoma law enforcement, the supply and demand for methamphetamine never really went away. Similar trends are now appearing on the national level. With the most recent drug threat assessments indicating that methamphetamine availability is increasing as a result of a growth in both domestic production and Mexican production, and that individuals and criminal groups are increasingly diverting licit chemicals for manufacturing from production countries such as South America, it is time to reconsider methamphetamine control strategies.

The U.S. methamphetamine problem is demonstrative of the limitations of crime control strategies that are focused on a single aspect of a larger, multidimensional crime problem. The global methamphetamine problem serves as an example of the dynamic and ever-changing nature of illicit drug markets. It has been said that "drug markets evolve and change over time" (Curtis & Wendel, 2000, p. 139) becoming "more or less complex as they metamorphose" (p. 139). With the case of methamphetamine, it appears as though the problems related to methamphetamine use and the illicit drug markets that produce and supply methamphetamine are becoming increasingly complex. Methamphetamine manufacturing has changed numerous times over the past several years, often in response to increased controls in precursor chemicals and other ingredients. The supply of methamphetamine is maintained by an ever-changing market made up of local manufacturers and illicit drug traffickers. The complexity of the larger drug market has increased as licit chemicals are increasingly being diverted for production purposes. The methamphetamine example illustrates the dynamic nature of the diverse components of the drug market and the potential adaptability of offenders in response to control efforts.

Throughout the years when methamphetamine laboratory seizures were declining, methamphetamine was continuing to be referred to as a "principal drug of concern" (DEA, 2006, p. 1) and one of the primary drugs of choice in Oklahoma (DEA, 2007, 2008) by federal law enforcement officials. As the survey data presented here demonstrate, Oklahoma law enforcement were very aware of the ongoing changes in the methamphetamine problem and understood early on that despite an observed reduction in laboratories, the problem continued to be a serious one. The shifts in manufacturing processes that have occurred demonstrate the adaptability of motivated offenders. Some manufacturers adapted their activities in the face of strict controls on pseudoephedrine. There is growing evidence that traffickers similarly adapted, becoming increasingly involved in maintaining the supply of methamphetamine once local manufacturing became more difficult and risky. The recent rise in local manufacturing should not come as a surprise since the underlying

methamphetamine use problem had never comprehensively been addressed. The story of the methamphetamine problem in Oklahoma is one of a changing and continuing problem. Understanding illicit drug problems and how they change over time is essential for informing responses and developing effective strategies.

Endnotes

[1] Earlier versions of this paper were presented at the 13th Environmental Criminology and Crime Analysis symposium in Brasilia, Brazil, and at the American Society of Criminology conference in 2009.

[2] Copies of the survey were also sent to OBNDD and the Marshall's office. These agencies were not counted as part of the sample size.

[3] Some survey responses were incomplete. One survey respondent sent back a blank survey with a response letter attached.

[4] Specific details from this letter were removed to protect the confidentiality of the respondent.

[5] Legislation passed prior to 1999 are not included Figure 2.

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