RAND

Drug Policy Research Center

A JOINT ENDEAVOR WITHIN RAND HEALTH AND
RAND INFRASTRUCTURE, SAFETY, AND ENVIRONMENT

THE ARTS
CHILD POLICY
CIVIL JUSTICE
EDUCATION
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INTERNATIONAL AFFAIRS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
SUBSTANCE ABUSE
TERRORISM AND HOMELAND SECURITY
TRANSPORTATION AND INFRASTRUCTURE
WORKFORCE AND WORKPLACE

This PDF document was made available from www.rand.org as a public service of the RAND Corporation.

Jump down to document

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

Support RAND

Browse Books & Publications

Make a charitable contribution

For More Information

Visit RAND at www.rand.org

Explore the RAND Drug Policy Research Center

View document details

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND PDFs to a non-RAND Web site is prohibited. RAND PDFs are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see RAND Permissions.

This product is part of the RAND Corporation monograph series. RAND monographs present major research findings that address the challenges facing the public and private sectors. All RAND monographs undergo rigorous peer review to ensure high standards for research quality and objectivity.

The Economic Cost of Methamphetamine Use in the United States, 2005

Nancy Nicosia, Rosalie Liccardo Pacula, Beau Kilmer,
Russell Lundberg, James Chiesa

Sponsored by the Meth Project Foundation and the
National Institute on Drug Abuse

Drug Policy Research Center

A JOINT ENDEAVOR WITHIN RAND HEALTH
AND INFRASTRUCTURE, SAFETY, AND ENVIRONMENT

This study was sponsored by the Meth Project Foundation and the National Institute on Drug Abuse and was conducted under the auspices of the Drug Policy Research Center, a joint endeavor of RAND Infrastructure, Safety, and Environment and RAND Health.

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

© Copyright 2009 RAND Corporation

Permission is given to duplicate this document for personal use only, as long as it is unaltered and complete. Copies may not be duplicated for commercial purposes. Unauthorized posting of RAND documents to a non-RAND Web site is prohibited. RAND documents are protected under copyright law. For information on reprint and linking permissions, please visit the RAND permissions page (http://www.rand.org/publications/permissions.html).

Published 2009 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665
RAND URL: http://www.rand.org
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

Summary

After marijuana, amphetamines are the most widely used illicit drug worldwide (UNODC, 2008). The United Nations estimates that amphetamine users nearly equal the number of cocaine and heroin users combined (25 million versus 28 million). In the United States, the recent increase in the prevalence of amphetamines, particularly methamphetamine (meth), is cause for concern. The meth situation in the United States is a complicated story of conflicting indicators, however. On the one hand, national reporting systems monitoring drug use among household- and school-based populations suggest that meth is a relatively minor drug of concern (NSDUH, 2006; Johnston and O'Malley, 2007). According to the National Survey on Drug Use and Health (NSDUH), only 0.5 percent of the household population reported use in 2005, far below prevalence rates for marijuana and cocaine and slightly lower than those for heroin (NSDUH, 2006). Similarly, reports from high-school seniors suggest that meth abuse is relatively minor, with annual prevalence rates in 2005 of just 2.5 percent as compared with rates of 5.1 percent for cocaine, 9.7 percent for hydrocodone (e.g., Vicodin®), and 33.6 percent for marijuana (Johnston and O'Malley, 2007).

On the other hand, regional data systems, law-enforcement agencies, and county hospitals indicate that meth is the most significant problem facing the populations they serve (NDIC, 2007b; NACO, 2005, 2006; NIDA CEWG, 2005). According to information reported by the National Institute on Drug Abuse Community Epidemiology Work Group, in 2004, meth was the primary drug of abuse in 59 percent of treatment admissions in Hawaii, 51 percent of treatment admissions in San Diego, and 38 percent of treatment admissions for the entire state of Arizona. (These percentages all exclude treatment for alcohol abuse.) In 2005, 39.2 percent of reporting state and local law-enforcement agencies cited meth as their greatest drug threat, exceeding the percentage reporting cocaine and crack to be the greatest threat (35.3 percent) (NDIC, 2007a).

While it is clear that the prevalence of meth problems is greater in western and rural states, there is evidence of a national problem. Data from the Treatment Episode Data Set (TEDS) show that treatment admissions for meth more than doubled nationally between 2000 and 2005 (NDIC, 2007b). Growth in amphetamine-related treatment admissions, which are dominated by meth, increased in every region between 1992 and 2005. Furthermore, information from the 2005 Drug Abuse Warning Network (DAWN), which monitors drug-related emergency-department (ED) episodes, reveals that stimulant-related admissions, including those due to meth, are just as likely as heroin admissions nationally once the margin of statistical error is taken into account. Yet, meth remains far less part of national discussions than are cocaine, heroin, marijuana, and prescription-drug abuse. Meth has not been the focus of media campaigns like the Marijuana Prevention Initiative. And only with the 2006 reautho-

rization did the National Youth Anti-Drug Media Campaign require that at least 10 percent of the fiscal year 2007 appropriation focus on reducing meth use.

Meth is a highly addictive substance that can be taken orally, injected, snorted, or smoked. When smoked or injected, the user immediately experiences an intense sensation followed by a high that may last 12 hours or more. Concerns about meth use arise from its highly addictive nature and its association with a number of adverse physical effects, including hypertension and other cardiovascular effects, seizures and convulsions, pulmonary impacts, and dental damage. Users also suffer psychological effects, such as anxiety, irritability, and loss of inhibition, which can lead to risky sexual and other types of behavior. Meth users who inject the drug expose themselves to additional risks related to injection-drug use, including contracting human immunodeficiency virus (HIV), hepatitis B and C, and other bloodborne viruses. Meth production imposes additional health risks on users and nonusers alike. The process for producing meth, a synthetic substance, is hazardous and susceptible to fire and explosion. Moreover, the production of each pound of meth results in 5–6 pounds of toxic by-product. As a result, health and environmental effects may also follow from the production process. Despite the documented harms associated with use, research to date has not attempted to quantify the social cost or burden this drug places on society today.

In this monograph, we attempt to fill the void by building the first national estimate of the economic burden of meth use, based on information available for 2005. We chose to focus on estimating the burden in 2005 because it is the most recent year for which we were able to obtain the data necessary to construct our estimate. Unlike data for other substances of abuse, the data necessary to build such an estimate nationally are far from complete or comprehensive. Furthermore, the scientific literature has yet to develop consistent evidence of causal associations for many of the harms that meth is believed to cause. Thus, calculation of the cost of consequences must be necessarily imprecise, as it can only reflect the state of the knowledge available today, which will change as more research is done in particular areas. To capture the relative imprecision of what is actually known today, we produce lower and upper bounds of all our point estimates. The variation represented in these lower- and upper-bound estimates reflects, in some instances, sampling variability in data sets that are available and, in other instances, the lack of data from which to obtain a precise point estimate. Despite this variability, we attempt to generate a best estimate of these costs based on what we understand of the science today. But we also point out that there are many cost areas that contribute to the economic burden that we are unable to measure and hence have to exclude from our calculations.

Our results are surprising for a substance that has received limited national attention. Even before monetizing the consequences associated with meth use, we see in Table S.1 that the toll in terms of premature death and lost well-being, as measured in quality-adjusted life-years (QALYs), is substantial. We estimate that meth use was responsible for nearly 900 deaths in 2005 and resulted in a total loss of more than 44,000 QALYs. According to data from the DAWN mortality publications, there were far more meth-related deaths than marijuana-related deaths in any given year (SAMHSA, 2007b). Yet, marijuana has remained the focus of the national antidrug campaign (ONDCP, 2008).

Following previous cost-of-illness (COI) studies estimating the burden of other substances of abuse, we consider in this monograph the cost of numerous consequences associated with use, including the cost of meth treatment, the excess health care service utilization

Table S.1
The Burden of Methamphetamine in 2005 in Terms of Premature Death and Lost Quality of Life

Burden	Lower Bound	Best Estimate	Upper Bound
Premature mortality	723	895	1,669
Lost QALYs	32,574	44,313	74,004

associated with meth use and dependence, productivity losses due to the drug, and the cost of meth-associated crime. In contrast to previous COI studies, however, this monograph also considers the cost to society associated with the production of meth, the intangible burden borne by those addicted, and child endangerment.

Using the national data available on each of these cost consequences, our best estimate of the economic burden of meth use in the United States in 2005 is roughly $23.4 billion (Table S.2). This figure includes the estimable costs associated with drug treatment, other health costs, the intangible burden of addiction and premature death, lost productivity, crime and criminal justice costs, child endangerment, and harms resulting from production.

Many of our estimates are subject to substantial uncertainty, however, so for all of our estimates, we provide lower- and upper-bound estimates that help us better understand where paucity of data or scientific research might influence the credibility of our single point estimate. The degree of uncertainty, as indicated by these lower and upper bounds, varies considerably across cost components, with some categories showing much greater uncertainty than others (see Table S.2). When considered together, the uncertainty about each component contributes to the uncertainty about the total. Taking this aggregation of uncertainties into account, we estimate that the true economic burden is likely to be in the range of $16.2 billion to $48.3 billion.

In reviewing the key contributors to the total estimated costs, we found that most of meth's costs are due to the intangible burden that addiction places on dependent users and to premature mortality. We estimate the cost associated with these losses at $16.6 billion, representing nearly two-thirds of our total cost estimate. The majority of these costs are due to the intangible cost of addiction ($12.6 billion). That number is the product of the number

Table S.2
Social Costs of Methamphetamine in the United States in 2005 ($ millions)

Cost	Lower Bound	Best Estimate	Upper Bound
Drug treatment	299.4	545.5	1,070.9
Health care	116.3	351.3	611.2
Intangibles/premature death	12,513.7	16,624.9	28,548.6
Productivity	379.4	687.0	1,054.9
Crime and criminal justice	2,578.0	4,209.8	15,740.9
Child endangerment	311.9	904.6	1,165.7
Production/environment	38.6	61.4	88.7
Total	16,237.3	23,384.4	48,280.9

NOTE: Due to rounding, numbers may not sum precisely.

of people dependent on the drug and the monetary value of the lost quality of life (QoL), measured by a reduction in QALYs. The estimate is subject to great uncertainty, because of assumptions underlying our upper- and lower-bound estimates of the number of people dependent and the valuation of their lost QALYs. The remaining cost ($4.0 billion) is due to premature mortality among users. The uncertainty in this estimate is also significant, reflecting the variation in assumptions as to which deaths are attributable to meth. Moreover, we caution that both of these estimates depend on the value placed on a lost life, which, based on the literature, we take to be $4.5 million. We use $4.5 million as the value of a life rather than ascribe a range of estimates, but we provide our estimates of the number of events so that the reader may recalculate the associated costs with alternative valuations.

Crime and criminal justice costs represent the second-largest category of costs at $2.5 billion to $15.8 billion and a best estimate of $4.2 billion. Meth-specific offenses represent more than half of these costs, totaling $2.4 billion. These are the costs associated with processing offenders for the possession and sale of meth. Meth-induced violent and property crimes that are generally attributable to actions of people under the influence of meth or in need of meth represent an additional $1.8 billion in costs. Finally, an additional $70 million is due to parole and probation violations for meth offenses. It is possible that these costs are significantly underestimated, however, as the scientific literature regarding the causal association between meth and property and violent crime is inconclusive. We conducted our own analyses to explore the causality and association and, in our best estimate, find sufficient support to include an estimate of meth-induced property crime, but not violent crime. The very large bounds on this element are due to alternative assumptions of causality that warrant additional research.

Costs associated with productivity losses represent another substantial category of costs. The best estimate for total productivity losses is $687 million. Most of the productivity losses are due to absenteeism ($275 million) and incarceration ($305 million). Smaller contributors are the costs due to a lower probability of working among meth users ($63 million) and the cost of employer drug testing ($44 million). We do not attempt to estimate any losses embodied in the potential changes in wages paid to meth users vis-à-vis nonusers. Nor can we include any estimates of the higher health care and workers' compensation costs paid by employers because of employees' meth use.

We calculate the costs associated with drug treatment at approximately $545 million, almost all of it in the community-based specialty treatment sector ($491 million). The total also includes $39 million of federally provided specialty treatment, almost entirely through the Indian Health Service (IHS) and the U.S. Department of Veterans Affairs (VA), and $15 million for treatment received in general short-stay hospitals. We did not have access to data on the cost of treatment received in the general, non–hospital-based medical sector, so these costs are omitted.

We estimate approximately $351 million for additional health care costs among meth users. These include $27 million for hospital admissions induced by the use of meth, $14 million for the incremental costs of caring for patients admitted for another cause but whose conditions are exacerbated by meth use, $46 million for ED care of meth patients not admitted to the hospital, and $14 million for hospital inpatient care of suicide attempts to which meth use is a likely contributor. The largest contribution is an additional $250 million for health administration and support. The health care total is likely an underestimate because it includes only the incremental costs for other conditions even though a share of those conditions may have been caused by meth and meth-induced behaviors.

Child-endangerment costs are estimated at $905 million. Our estimates are limited to children who are removed from their homes by the foster-care system, so these costs are likely an underestimate of the full burden of meth abuse. Substance abuse is a key contributing factor in two-thirds of those removals, though we must make some assumptions about the specific role of meth. The largest contributor to these costs is the medical, mental, and QoL losses suffered by children ($502 million), though the burden on the foster-care system is similar in size ($403 million). The substantial uncertainty derives from the uncertainty regarding how many of those substance-associated removals are related to meth and our inability to measure accurately the cost of these episodes.

Potentially unique costs of meth are the harms associated with production. We estimate the social costs associated with the meth-production process at $61 million. About half of those costs are due to injuries and deaths from hazardous-substance events, such as explosions and fires ($32 million). About half the casualties are suffered by responding emergency personnel, but the more serious and costly events are not suffered by first responders. The other half of the production costs are due to cleanup of hazardous wastes at discovered laboratory facilities ($29 million). The substantial range—from $39 million to $89 million—results largely from uncertainty in estimating the number of deaths attributable to meth production.

While our methods are not completely comparable to those of other prevalence-based COI studies for the abuse of other drugs or drugs in general (e.g., Mark, Woody, et al., 2001; ONDCP, 2004b), our results are similar in a few key ways. The major cost drivers for meth, if we ignore the intangible burden of addiction (which is omitted from other estimates of the cost of drug use), are similar to those for other illicit drugs, with losses associated with premature death and crime being major components. Importantly, if we take out the intangible cost of addiction from our estimate (representing $12.6 billion), our revised estimate of the total economic burden of meth use ($10.8 billion) represents 5.5 percent of the total cost of illicit drug use in the United States reported by the ONDCP (2004b). While this might seem like a small fraction, it represents a greater share of the economic burden than simple consumption rates would suggest. According to annual prevalence data from the NSDUH, meth users represent only 3.7 percent of all illicit-drug users (NSDUH, 2006). If we use our upper-bound estimate of the cost of meth use (still excluding intangibles), we find that meth users represent 7.2 percent of the total cost of illicit drug use, approximately twice the burden suggested by consumption alone.

If we consider the cost per meth user, our best estimate translates into $26,872 for each person who used meth in the past year or $74,408 for each dependent user. The per capita cost, like our overall estimate, is sensitive to the inclusion of the intangible burden of addiction. If we ignore this intangible cost, the costs in the past year for each user and meth-dependent user are appreciably smaller at $12,395 and $34,322, respectively. This suggests that the average cost per heavy meth user (ignoring intangible cost of addiction) is at least 75 percent of the estimated average cost per heroin addict in 2005 dollars (Mark, Woody, et al., 2001).

While this monograph highlights key components of the costs of meth that we were able to quantify, further research is needed in a number of areas before a true accounting of the full economic burden can take place. Throughout this monograph, we identify and (whenever possible) provide evidence on the potential magnitude of various cost components that we are unable to include explicitly in our estimate because of data issues and inconclusive science regarding causality. These are obvious areas in which more research would be fruitful. Specific areas that are likely to translate into substantial costs in terms of the overall burden

include meth-associated crime, child endangerment in non–foster-care settings, employer costs of hiring meth workers, and health care costs associated with treating meth-induced health problems. Estimates of the total cost and its components do not provide adequate information to inform policymakers regarding the most effective policies to reduce the harms associated with meth use. More research should be conducted to identify cost-effective strategies for dealing with the problem and reducing particular harms associated with use.

In developing policies to address meth, it is also important to recognize the key differences between meth and other substances, such as the harms to persons and the environment that result from meth's unique production process, of which only a fraction are estimated here. Of course, this monograph can only highlight the key components of the costs of meth, in the hope that these will be more salient to policymakers and that their attention will be directed to the more important aspects of the problem. This research cannot directly support one policy or another. Further research is needed to inform policymakers on the most effective strategies to reduce these harms.

A final insight from this study is that, in the case of meth abuse, we should be cautious interpreting evidence from national household surveys and school-based studies as indicators of the problem. Clearly, the burden of meth abuse is substantial, far exceeding what would be implied by simple prevalence measures from either of these populations. Moreover, as is the case with other substances of abuse, it is probably not the recreational meth user who imposes the greatest burden on our society, but rather those who become addicted, engage in crime, need treatment or emergency assistance, cannot show up for work, lose their jobs, or die prematurely. These are the individuals who impose the greatest cost on society, yet they are also generally populations that are not adequately captured in household- or school-based surveys.