III. DATA AND ESTIMATION OF BASE COST COMPONENTS

The economic costs related to drug abuse can be divided into three major components: health care, lost productivity, and other impacts (primarily criminal justice impacts). In this section of the report we discuss how the updated estimates have been developed for the respective detailed components and identify key data used for this purpose. As indicated previously, these estimates are built upon the original detail calculations of Harwood et al. (1998), and the estimates developed in the prior update study (ONDCP, 2001).

A. Health Care Costs

Table III-1 displays the health care cost detailed components and their estimated cost for 2002. We assessed the available data and determined the most appropriate method for updating each of these numerous components. The methods for updating each component are described below.

Table III-1
Health Care Costs, 1992 and 2002
(in millions of dollars)

Detailed Cost Components	1992	2002	Annual Change
Community-Based Specialty Treatment	$3,770	$5,997	4.8%
Federally-Provided Specialty Treatment			
Department of Defense	$14	$8	-5.8%
Indian Health Services	$26	$54	7.6%
Bureau of Prisons	$17	$39	8.8%
Department of Veterans Affairs	$113	$116	0.2%
Health Infrastructure and Support			
Federal Prevention	$616	$1,203	6.9%
State and Local Prevention	$89	$148	5.2%
Training	$49	$69	3.5%
Prevention Research	$158	$402	9.8%
Treatment Research	$195	$564	11.2%
Insurance Administration	$268	$476	5.9%
Medical Consequences			
Hospital and Ambulatory Care Costs	$518	$1,454	10.9%
Special Disease Costs			
Drug-Exposed Infants	$407	$605	4.0%
Tuberculosis	$30	$19	-4.6%
HIV/AIDS	$3,489	$3,755	0.7%
Hepatitis B and C	$462	$312	-3.9%
Crime Victim Health Care Costs	$92	$110	1.8%
Health Insurance Administration	$340	$513	4.2%
Total	**$10,653**	**$15,844**	**4.1%**

Source: Analysis by The Lewin Group, 2004.

The objective of this part of the report is to provide the reader with the most important data and estimates that relate to the estimates as well as provide a brief description of how the updated estimates have been developed. In accomplishing this, we present or describe the critical data that has been used in developing the updated estimates. This report is actually an extension of Bouchery and Harwood (2001) in the sense that the methods and data sources employed herein are generally identical to those of the earlier report. Thus, the following text does not attempt to replicate all of the data tables and specifications presented in the earlier report, since they can still be directly accessed elsewhere. There have been a few changes necessitated because data series published by agencies have been dropped or replaced. These are noted where applicable.

1. Community-Based Specialty Treatment

Community-based specialty treatment includes all specialty drug abuse treatment which is not delivered through facilities operated by or at a federal agency. The most comprehensive and recent study of treatment spending was done by Mark et al. (1999a and 1999b). Specialty drug treatment spending in 1997 was $5.3 billion. SAMHSA has commissioned a new study to develop more current estimates of spending, which will take advantage of new data and improved data sets. Estimates from this study should be released in the next year.

The Mark et al. (1999a) estimates include costs for community-based specialty treatment as well as for the Department of Defense, Bureau of Indian Affairs, Bureau of Prisons, and Veterans Affairs. To update the estimate of community-based specialty treatment costs, we obtained estimates of the federal spending for these agencies costs from the ONDCP *National Drug Control Strategy: Budget Summary* (various years) and subtracted these costs from the overall Mark et al (1999a) estimates. The federal specialty treatment costs are discussed in the next section.[7]

Spending for community-based treatment is projected for 1998-2002, since the Mark et al. (1999a) estimates are only available through 1997. While there are numerous factors that influence spending, the projection method has identified two major elements: the number of persons getting "expensive" substance abuse treatment and the rate of inflation in medical prices to consumers (Table III-2). Between 1998 and 2002 the number of persons getting inpatient or residential treatment modestly declined—from 122,600 to 116,100, or 5 percent. Medical costs to urban consumers grew 18 percent, about 4.3 percent annually. The adjustment factors for earlier years are not presented because Mark et al. (1999a) developed estimates for those years.

[7] Once these amounts were subtracted, the Mark et al. (1999a) estimate for the cost of community-based specialty treatment in 1992 is $374 million higher than the Harwood et al (1998) estimate of community-based specialty treatment costs. The Mark et al. (1999a) estimate is higher because it is more comprehensive.

Table III-2
Factors for Updating Specialty Treatment Costs, 1998-2002

Data Series	1998	1999	2000	2001	2002
Daily Census of Clients in Inpatient or Residential Care (in 000s)	122.6	(116.0)	109.3	(112.7)	116.1
Consumer Price Index - Medical Services, All Urban Consumers	242.1	250.6	260.8	272.8	285.6

Note: values in ( ) are interpolated from adjacent values because they were not estimated by SAMHSA.
Sources: UFDS/N-SSATS client census online from Substance Abuse Mental Health Services Administration; CPI-M online from U.S. Department of Labor, Bureau of Labor Statistics.

2. Federal Specialty Treatment Costs

A relatively limited amount of specialty substance abuse treatment is funded and delivered through federal agencies. These expenditures were $217 million in 2002. Specifically, we obtained cost estimates for the Department of Defense, Bureau of Indian Affairs, and Bureau of Prisons from the *National Drug Control Strategy: Budget Summary* (Office of National Drug Control Policy), which is published annually. Thus, estimates were obtained for each year between 1992 and 2001 from these reports. The estimate for 2002 is based on the budget request for that year as reported in the *Budget Summary* for 2002. Values for 1992-2002 are in Appendix C.

The $116 million estimate for the Department of Veterans Affairs (VA) was derived from an alternative source because the value reported in the ONDCP *Budget Summary* is too broad—it includes costs of many types of health services that drug abusers have obtained. Fortunately, the annual VA spending on specialty substance abuse treatment has been estimated by the VA research department in Palo Alto, CA (Chen et al., 2001 and 2003). They estimated that specialty care worth $358 million was delivered in 2002, but did not allocate costs between drug and alcohol abuse. The online analytic files of the Treatment Episode Data Set (TEDS) operated by SAMHSA allows veterans entering public treatment clinics to be studied. In 2000, 32.3 percent of veterans being admitted to public substance abuse clinics tracked by TEDS were drug abusers, increasing steadily from only 22.5 percent in 1992. It was thus estimated that $116 million was spent by VA on specialty substance abuse treatment in 2002, and similar calculations and have been made for 1992-2001.

3. Health Infrastructure and Support

Prevention, training, research, and health administration are also critical health services. The methodology for updating each of the components of health infrastructure and support is discussed, respectively, below.

a) Prevention

The federal government is the primary source of funding for drug abuse prevention services, although the services are primarily delivered through state and local governments in the form of in-school and community initiatives. It is estimated that national spending on drug abuse

prevention was about $1.35 billion in 2002. The vast majority of this was from federal financing ($1.2 billion) and the remainder from state and local government funding ($150 million).

Total federal appropriations for substance abuse prevention in FY2002 was $2.15 billion. Note that this includes alcohol as well as drug prevention. The values for 1999-2002 are from the *National Drug Control Strategy, FY 2003 Budget Summary*, published February 2002 and values for earlier years were drawn from prior editions of the NDCS. Because these estimates include funding for prevention of alcohol abuse, as well as drug abuse we apportion the spending estimate between alcohol and drug abuse based on data from analyses of the primary reason for treatment among clients in the SAMHSA National Survey of Substance Abuse Treatment Services (or N-SSATS; previously known as the Uniform Facility Data Set or UFDS; Substance Abuse Mental Health Services Administration). The 2002 data indicated that 24 percent of current clients were treated for drug abuse only, and 61.6 percent for both alcohol and drugs (Table III-3). Splitting the comorbid group in half to avoid double counting, the cost of alcohol and drug abuse treatment was apportioned 54.8 percent to drugs. The share allocated to drug abuse has increased from about 40 percent in 1992, as larger shares of clients present with primary drug problems or both drug and alcohol problems.

In addition, State and local substance abuse agencies spent about $599 million in 1999 on substance abuse prevention, according to *State Resources and Services Related to Alcohol and Other Drug Problems* (National Association of State Alcohol and Drug Abuse Directors, annual). This report and data was terminated due to lack of funding after 1999.

Table III-3
Derivation of State and Local Drug Abuse Prevention Spending, 1992-2002

Data Series	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Spending on Alcohol and Drug Abuse Prevention	$515	$517	$524	$563	$495	$492	$524	$599	$599	$599	$599
State and Local as Share of Total Spending	43.4	44.9	43.6	44.7	41.1	43.3	43.6	44.9	44.9	44.9	44.9
Share of TX Clients with Drug Abuse	40.0	40.0	40.0	40.0	40.0	40.0	51.6	52.4	53.3	54.1	54.8
State & Local Spending for DA Prevention	**$89**	**$93**	**$91**	**$101**	**$81**	**$85**	**$118**	**$141**	**$143**	**$145**	**$148**

Source: National Association of State Alcohol and Drug Abuse Directors. (annual); UFDS/N-SSATS data from Substance Abuse Mental Health Services Administration Web Site.

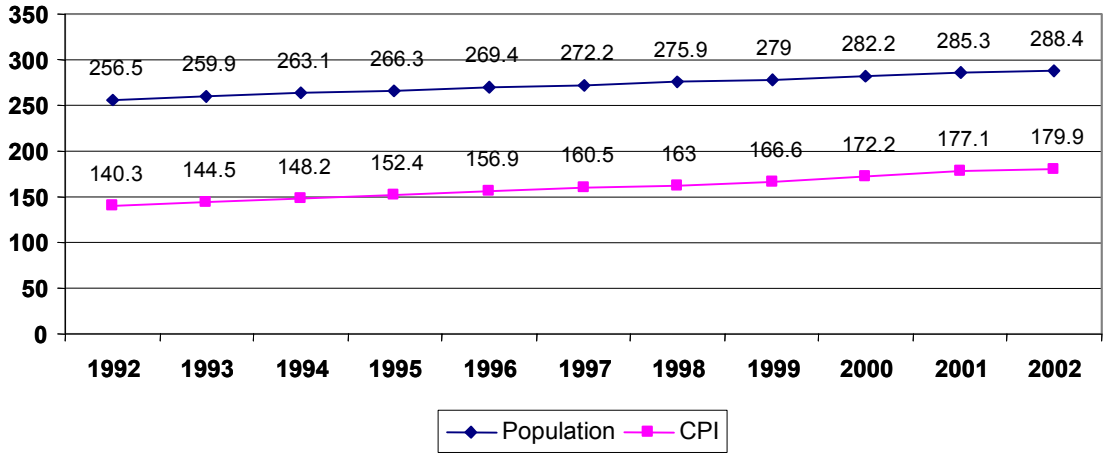
In principle an estimate is desired for spending on prevention that is directed against drug abuse and that includes only spending funded by state and local government (Table III-3). To apportion the spending between alcohol and drug abuse, we use the same ratio applied for federal spending on treatment. To apportion prevention funding between state and local government funds and funds from the federal government and other sources, we use estimates of the proportion of total spending included in the NASADAD report (i.e., spending for treatment, prevention, and all other activities) for alcohol and drug abuse that is from state and local government funds. This proportion was 44.9 percent in 1999, and ranged from 41.1 to 44.9 percent during the 1990s.

Prevention spending related to drug abuse that was funded by state and local governments was estimated at $141 million in 1999. Prevention spending estimates for 2000-2002 were adjusted only to reflect the growing proportion of those entering treatment with drug abuse problems. Because state and local governments experienced severe budget problems during this period no adjustments were made for either population or inflation growth over these years.

b) Training

The cost of training is projected to total about $69 million in 2002,from a base of $49 million in 1992. This estimate includes initial and continuing education related to drug abuse for specialists in substance abuse treatment as well as for other health professionals, law enforcement officials, criminal justice professionals, and clergy. No published data specific to these costs are available. Therefore, we update the 1992 estimate based on real change in the U.S. population and the change in the Consumer Price Index (Figure III-1).

Figure III-1
Trends in Factors for Updating Substance Abuse Training, 1992-2002



Sources: Population data from the Bureau of Census online files; CPI online from U.S. Department of Labor, Bureau of Labor Statistics.

c) Research

Virtually all research related to drug abuse is funded by the federal government and is reported annually in the *NDCS Budget Summary*. Although some foundations, notably the Robert Wood Johnson Foundation, support research as part of their efforts, no breakout between research and services is published. For FY 2002 federal prevention and treatment related research enacted funds came to $966 million of which about 58 percent was for treatment. Actual spending estimates are available for these two components through 2001. Research spending almost tripled between 1992 and 2002. Annual research expenditures are presented in Appendix C.

d) Health Administration

The cost of operating reimbursement systems (e.g., Medicaid, private insurance, state substance abuse agencies) is not included in estimates of the value of care delivered. The national health

accounts developed by the Centers for Medicare and Medicaid Services (CMS; Web Site) accordingly break out the cost of operating private and public insurance and reimbursement mechanisms. In 2002 CMS analysts estimated that health administration expenses were $107 billion (an additional 8 percent) on top of $1.33 trillion in total nation personal health care expenses (Table III-4). This factor has been applied to the projection of about $6.2 billion spending on substance abuse treatment, and $6.4 billion spent for care of other health consequences of drug abuse, on other yielding an estimate of $500 million and $153 million, respectively for these two components.

Table III-4
Health Insurance Administration Costs, 1992-2002

Data Series	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Health insurance administration costs ($ in billions)	49	53	58	61	61	61	65	73	80.	90	105
Personal health care expenditures (PHCE; $ in billions)	720	776	817	866	911	959	1010	1065	1135	1231	1340
Health insurance as % of PHCE	6.9%	6.8%	7.1%	7.0%	6.7%	6.3%	6.4%	6.9%	7.1%	7.3%	7.8%

Sources: Data on national health accounts published online by Centers for Medicare and Medicaid Services.

Based on CMS data, the level of health administration costs has increased more rapidly than personal health care costs. During most of the 1990s these costs were about 7 percent. Annual ratios from the CMS national health accounts were used in developing these values for 1998-2002, as was done for estimates in ONDCP (2001) and Harwood et al. (1998).

4. Medical Consequences

In addition to the care offered by the specialty substance abuse providers above, drug abuse increases health care costs in the following ways:

- Drug abuse may cause other illnesses (e.g., AIDS) that require treatment;
- Drug abuse may complicate the treatment of other illnesses or injuries, perhaps resulting in longer lengths of hospital stays; or
- Drug abuse may precipitate violent crimes that result in injuries that require medical care.

The methodology for updating these costs is described in the next several sections. In the section on hospital care costs, we describe our methodology for updating the costs for the following types of hospital medical care:

- Care for conditions specifically caused by drug abuse (e.g., polyneuropathy due to drugs, narcotics affecting fetus or newborn via placenta or breast feeding); and
- Additional hospital days resulting from comorbid drug abuse (secondary to other disorders).

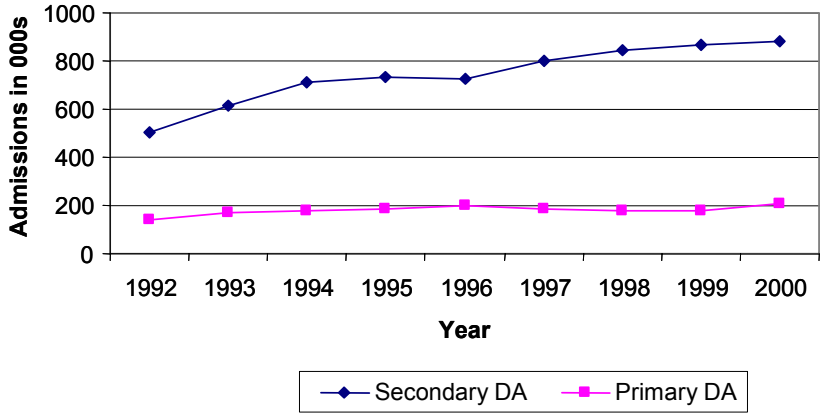
In the section on "specific disease costs" we describe the methodology for updating the estimated cost of specific health problems that are partially attributable to drug abuse. These illnesses are, respectively, HIV/AIDS, hepatitis B and C, drug-exposed infants, TB, and the health care costs related to violent crime. Finally, we describe how updates were done for health administration costs.

a) Additional Hospital Care Costs

Harwood et al. (1998) found that hospital stays where the patient has a secondary, but no primary, diagnosis of drug abuse are longer on average. The cost of hospital stays with primary diagnoses of drug abuse are included under the specialty care estimate, above. That study found that just over 2 percent of hospital stays (about 800 thousand) had a secondary drug abuse diagnosis, accounting for 500,000 days of hospital care in 1992, at a cost of $518 million.

The projected estimate for 2002 is $1.454 billion. The projected estimates were extrapolated from the 1992 value based on changes in (a) the number of hospital patients with secondary diagnoses of drug abuse and (b) the consumers price index for medical services. The data on hospital patients with secondary drug abuse diagnoses is from the National Hospital Discharge Survey (NHDS), which was the same data source used in Harwood et al. (1998) to analyze this issue initially. Tabulations of NHDS data are published annually by the National Center for Health Statistics on their web site. We have tabulated the number of admissions to short term hospitals in the US that had either a primary or secondary diagnosis of drug abuse[8]. Data for 1992 through 2000 (the most recent year) is graphed in Figure III-2 and appears in Appendix B..

Figure III-2
Admissions to Short-term Hospitals
with Primary or Secondary Diagnosis of Drug Dependence/Abuse, 1992-2000
(in thousands)



Source: NHDS data published online by the National Center for Health Statistics.

[8] Since the primary objective was to represent the trends in this factor, only the major drug abuse diagnoses were tabulated: drug dependence, drug abuse (exclusive of tobacco and alcohol) and drug psychoses.

While there was rapid growth in the early 1990s in the number of hospital admissions with secondary drug abuse diagnoses, growth then moderated to about 3.5 percent annually from 1994 forward. This rate was used to develop the cost projections for 2001-2002.

b) Specific Disease Costs

Certain types of medical consequences of drug abuse are underrepresented in the hospital and ambulatory care costs. These include the cost of drug-exposed infants, TB, HIV/AIDS, and hepatitis B and C and violent crime. Methods for updating these disease specific costs are described in this section.

(1) Drug-Exposed Infants

This cost has been trended forward from 1992, and is $605 million for 2002. The original estimate of $407 million for 1992 was based on several studies in the early 1990s (United States General Accounting Office; 1990, Phibbs et al., 1991; Joyce et al., 1994) that found newborns of women who used cocaine during their pregnancy were more likely to require care in neonatal intensive care units and to end up as "boarder babies."

While there appears to have been no rigorous national level analysis of the trends in the problems experienced by drug-exposed infants, a SAMHSA (2004) analysis of the National Survey on Drug Use and Health (NSDUH) found that in 2002, 3 percent of pregnant women had used illicit drugs in the past month, about half the rate of other women. However, use of cocaine, which is the major correlate of neonate problems, was only reported by 0.1 percent of pregnant women (about 4,000 pregnant women in a given month). Most of the illicit use was of marijuana (2.7 percent) or prescription medications (0.9 percent). Estimates from the NHSDA for earlier years were based on small numbers of observations and displayed significant variability from year to year. In contrast, one of the earliest analyses of the NHSDA (Gomby and Shiono, 1991) estimated that 4.5 percent of newborns had been exposed to cocaine in utero. It is very possible that cocaine use by pregnant women has declined massively, perhaps due in large measure to the research and public information campaigns in the 1990s. If this is the case, then the current "projection" may be much too high.

The projection was based on growth 1992-2002 in the number of babies born per year (National Center for Health Statistics; this was virtually constant at about 4 million) and the change in the consumer price index for medical services, at 50.2 percent between 1992 and 2002 (see Appendix Table B-4).

(2) Tuberculosis (TB)

This component of costs has actually declined in both nominal as well as real terms since the initial estimate was developed for 1992. At $19 million in 2002 (versus $30 million in 1992 and $22 million in 1998), this is one of the smallest cost components separately trended forward. However, in the early 1990s TB was a major concern because after many decades of declines in incidence the rates were once again on the increase, and a number of patients had multiple-drug-resistant strains of TB. CDC data (published on the CDC web site) show that since 1992 the number of new TB cases has declined over 40 percent to about 15,000 cases per year, and the proportion of TB cases presenting with drug abuse as an exposure factor fell from 11.5 percent in

1996 to 9.2 percent in 2002. Note however, that only about 4.5 percent of TB cases were attributed to drug abuse in Harwood et al. (1998), recognizing that many TB patients had multiple exposure factors.

TB costs related to drug abuse were projected from the 1992 estimate of $30 million based on the change in drug-related TB cases (a decline of about 55 percent 1992-2002; see Table III-5) and the change in the consumer price index for medical services (50 percent in 1992-2002).

We measure the real change in the health care costs attributable to tuberculosis (TB) as the change in the number of cases of TB that are attributable to injecting or non-injecting drug users according to the Center for Disease Control (CDC). The number of TB cases is available from the CDC for each year between 1992 and 2002. However, the percentage of cases attributable to injecting or non-injecting drug users is only available for 1996 through 2002. Between 1992 and 1996, we assume the percentage of cases attributable to injecting or non-injecting drug users was fixed at the 1996 level. Table IIi-5 shows the number of TB cases overall and related to drug use between 1992 and 2002. We measure the price change in the TB costs related to drug abuse based on the change in the CPI-M (Appendix B).

Table III-5
Tuberculosis Cases, 1992-2002

Data Series	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total Cases (in 000s)[1]	26.7	25.3	24.4	22.9	21.3	19.9	18.4	17.5	16.4	16.0	15.1
Percent Non-Injecting Drug Use[1]	N.A.	N.A.	N.A.	N.A.	7.7%	7.8%	7.7%	7.1%	7.5%	7.2%	7.0%
Percent Injecting Drug Use[1]	N.A.	N.A.	N.A.	N.A.	3.8%	3.3%	2.9%	2.6%	2.5%	2.3%	2.2%
Drug Related TB Cases[2]	3,067	2,908	2,802	2,629	2,454	2,203	1,946	1,701	1,638	1,519	1,387

[1.] Source: National Center for Health Statistics (2003). *TB Surveillance Reports, 1996-2002.*
[2.] Source: calculation by The Lewin Group.

This update assumes that there was not a major change in the treatment cost per case for TB between 1992 and 2002. However, in the face of resurgent TB, a major public health push was undertaken, involving new patterns of care. These changes may have affected treatment costs.

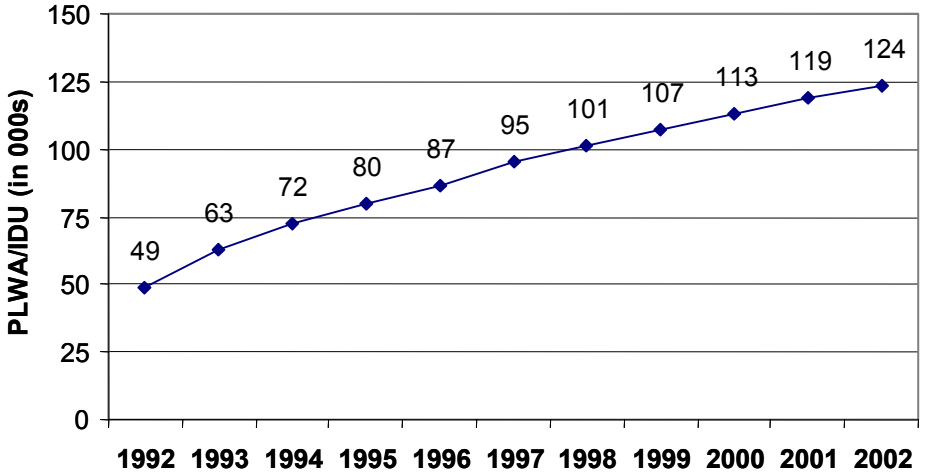
(3) HIV/AIDS

Risk of infection with HIV from injection drug use is one of the most feared consequences of drug abuse. This report estimates that in 2002 $3.75 billion was spent to treat 122,000 persons living with AIDS that have a history of injection drug use.

Data reported to the CDC indicate that nearly a third of persons living with AIDS in 2002 (and marginally higher proportions in the 1990s) have a history of injection drug use (*HIV/AIDS Surveillance Reports*, Centers for Disease Control and Prevention, 2003). This comes to an estimated 122,000 persons out of the total of 385,000 persons living with AIDS in 2002. Due to

both the increased effectiveness of HIV therapies and the spread of the disorder, the total population living with AIDS has grown from about 140,000 in 1992. Bozzette et al. (2001) have shown that most of the costs of treating HIV are for those that meet clinical criteria for AIDS, in contrast to HIV infected individuals that have few symptoms or are asymptomatic. This analysis uses the proportion of "persons living with AIDS" (PLWA) with a history of injection drug use to determine the share of national HIV spending to allocate to drug abuse. Figure III-3 shows the number of adult persons living with AIDS in 1992 through 2002. Detailed data and tabulations are in Appendix B.

Figure III-3
Persons Living with AIDS, with Injection Drug Use Exposure, 1992-2002
(persons in thousands)



Source: analysis of data from Center for Disease Control and Prevention, 2003

The most recent comprehensive study of the cost of caring for individuals with HIV/AIDS (Hellinger and Fleishman, 2000) estimated that the cost of treating all people with HIV disease in 1996 was between $6.7 and $7.8 billion. This range was calculated through two different approaches, specifically, payer-based and provider-based. The estimates calculated under each approach were compared. We use the mid-point between these two estimates, $7.25 billion, as our estimate for total medical spending on HIV/AIDS in 1996. A more recent study (Bozzette et al., 2001) essentially confirmed the earlier estimate. The value was moderately lower, but the study design was expected to capture fewer of the costs and the study found that costs per person treated for HIV infection declined about 14 percent from 1996 to 1997-98. This was the time that new, more effective medications for HIV became generally available.

This study assumes that after 1998 HIV costs increased at the same rate as the CPI for medical care (the CPI-M), which may be a conservative assumption because pharmaceutical prices in general have risen more rapidly that the cost of other medical services since the late 1990s.

(4) Hepatitis B and C

Injection drug use is also known to be a vector for transmission of viral hepatitis B and C (HBV and HCV, respectively). Studies by CDC (1996, 2000) found that in the mid-1990s about 12

percent of hepatitis B cases and 23.6 percent of hepatitis C cases belonged to the injection drug user exposure category. Data on injection drug exposure has not been published since that time.

In this update it is projected that the cost of treating injection drug related viral hepatitis was about $312 million in 2002, down from the estimate of $462 million for 1992 and $434 million in 1998. Despite 50 percent growth in medical costs between 1992 and 2002 these costs have declined because the acute incidence of HBV and HCV declined by more than half, and two thirds, respectively over this time period. In 2002 there were only 6,800 reported acute HBV cases and 3,600 estimated HCV cases, although there are 1.25 million and 2.7 million individuals with chronic (non-acute) cases that could cause health problems in the future. The change in these costs since 1992 has been projected based on the changes in (a) the incidence of "reported" and "estimated" acute hepatitis B and C cases **(Table III-7)** and (b) the change in consumer prices for medical services. These estimates assume that there has not been a major change in the treatment cost per case for hepatitis between 1992 and 2002, apart from the average increase in medical inflation.

Table III-6
Acute Hepatitis Cases, 1992-2002
Hepatitis B (Reported) and Hepatitis C (Estimated)
(cases in thousands)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Hepatitis B	16.1	13.4	12.5	10.8	10.6	10.4	10.3	7.7	8.0	7.8	6.8
Hepatitis C	12.0	9.4	8.9	5.9	5.9	6.3	6.8	6.4	5.7	4.0	3.6
Total	28.1	22.8	21.4	16.7	16.5	16.7	17.1	14.1	13.7	11.8	10.4

Sources: Web site of Centers for Disease Control and Prevention. Fact sheet on *Disease Burden from Hepatitis in the United States*, and the *Morbidity Mortality Weekly Report*.

(5) Violent Crime

The cost of medical care provided to victims of drug abuse-related violent crime was estimated at $110 million in 2002. The National Crime Survey estimated that there were about 5.25 million violent victimizations, of which 380,000 (or 7.2 percent) are attributed to drug abuse. Studies of arrestees and prisoners find that about 5 percent of assaults and a quarter of robberies are committed by individuals addicted to expensive drugs (this literature was discussed in Harwood et al., 1998). The number of violent crimes as estimated by the NCS declined almost 50 percent since 1992 and most of that (35 percent) was since 1998. There has been no analysis of whether or how the role of drug abuse in violent crime has changed over this time period.

This $110 million estimate is based on 2002 data about the number and type of violent crimes. Also, annual estimates of violent crimes for other years are in Appendix B. In order to develop cost estimates we need data on how many of the violent crimes are caused by drug addiction, and the cost of health care per crime. These factors are not tracked in periodic data series, however, so these factors have been adapted and updated from Harwood et al. (1998). The CPI for medical services has been used to adjust the medical care cost per crime. The adjusted cost per victim factors are in Table IV-7. Thus, the estimated average cost of $210 in 1992 for medical care of assault victims was $315 in 2002 dollars, and the cost for robbery, rape and homicide were $6, $42 and $13,900, respectively. Fortunately, many victims of non-fatal victimizations

require very little or no medical care immediately after the attack, which makes the averages seem low. However, these estimates do not include costs for future disability, care for emotional trauma or the pain and suffering that many experience following trauma. The details of the calculations are in Table III-7.

Table III-7
Estimated Cost of Medical Care for Crime Victims, 2002

Type of Offense	Annual Offenses (in 000s)	Share attributed to Drug Abuse	Offenses attributed to DA (in 000s)	Cost per victim	Annual Cost ($ in millions)
Assault	4,581	5.1%	233.6	$315	$73.71
Rape	146	2.4%	6.5	$42	$0.15
Robbery	512	27.2%	139.4	$6	$0.84
Homicide	16	15.8%	2.6	$13,900	$35.40
Subtotal	5,255	7.3%	382.1	$288	$110.10

c) Health Administration

Similar to the calculation of health insurance administration costs related to specialty care, health administration costs related to the medical consequences of drug abuse are calculated as a percentage of the total medical service costs related to medical consequences of drug abuse. In 2002 these additional health consequences entailed projected costs of $6.378 billion. Based on the ratio that health insurance administration was almost 8 percent of personal health care expenditures, these costs totaled $513 million, an increase from $298 million in 1992.

B. Productivity Losses

Productivity losses represent a loss of potential economic activity, in contrast to expenditures for health goods and services and criminal justice system operations. Thus, productivity losses might be thought of as a loss of potential gross domestic product brought about because of a reduction in the supply or the quality and effectiveness of the labor force. In the US economy sustained growth (or contraction) in the workforce results on average in sustained growth in gross domestic product, although there certainly are short term variations as the business conditions change--as reflected by swings in the unemployment rate. Between 1970 and 2000 the US labor force (those wanting to work) grew 59 million persons (from 84 to 143 million) and the level of employment increased by 59 million persons (from 79 to 138 million). Growth or shrinkage of the labor force results in remarkably similar changes in legitimate employment. In general, there is reason to believe that a sustained decrease in the legitimate labor supply reduces not only the pool of workers but ultimately the number of persons employed in the legitimate economy and therefore the size of the economy as measured by, e.g., the gross domestic product. For example, 2 million drug abusers are unavailable or choose not to work in order to pursue crime careers or are incarcerated)

There are several different ways in which any major health problem decreases the size or effectiveness of the legitimate labor supply in the United States, or any other economy. These

include premature deaths, as well as disability and sickness, including time convalescing or recovering. Moreover, in the case of drug abuse we have the drain on our legitimate workforce and economy posed by individuals pursing "crime careers" (theft, drug sales) instead of legitimate work, as well as the loss from incarceration of drug offenders. Since a single drug abusers may experience all of these over time, the calculations have been performed in a manner to attempt to avoid "double counting." This is done by using "annual averages" which account for individuals moving in and out of particular states or activities.

Valuation of the loss of a worker from productive activities is based on his/her expected value of productivity. In the labor market this equals their expected wage rate plus the value of fringe benefits (about 30 percent on top of wage/salary before taxes). Under this methodology non-market, or household productivity is also valued. It is equal to the cost of hiring someone to perform the services they are unable to perform due to sickness, disability or death. If a person has primary household responsibility, studies find their household productivity and thus household services replacement cost is higher than for a person that also works out of the home.

In 2002 the average hourly compensation for civilian employees (the "employer cost for employee compensation", or ECEC) was just over $23, of which $6.50 was for benefits such as employer contributions for insurance of various types, retirement contributions, social security and employment taxes. Studies have estimated the cost of replacing full-time household services to be somewhat less than the value of full-time employment. Individuals of different ages and genders have different average rates of expected employment, compensation and housekeeping contributions. The original, detailed estimates from 1992 incorporated national averages for these productivity-related factors as well as available detail about the demographic composition of drug abusers in the workforce, in treatment, engaged in crime careers and/or incarcerated. By updating the 1992 estimates it is assumed that those demographic distributions have not changed over time.

Figure III-4 below illustrates the impact of drug abuse on the loss of potential productivity from the legitimate economy. Total economic productivity (gross domestic product) is the product of the size of the employed workforce and the value of their productivity, or box 0ABC. When drug abuse impairs or diverts workers it effectively reduces the size of the workforce and therefore the size of legitimate productivity to 0DEC, which is smaller than box 0ABC. This graphic could be modified to reflect some drug abusers staying in the legitimate workforce, but at lower productivity jobs. This could take the form of impacts of drugs on functioning and productivity or avoiding jobs with drug testing that might have higher responsibilities and wages.

Figure III-4
Lost Productivity Due to Drug Use, 2002

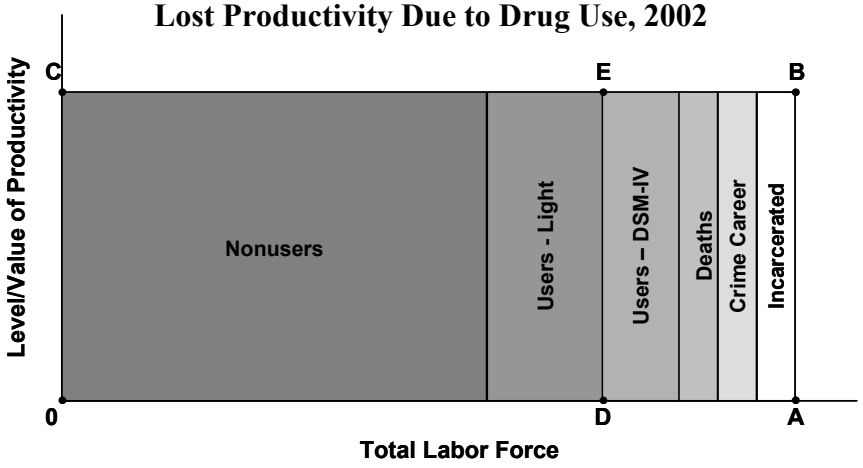


Table III-8 displays the cost components of lost productivity and the 1992 and 2002 estimated cost for each component. The cost for all of the components of the productivity loss estimate increased in this period. The fastest increases were for productivity losses related to drug abuse-related illness and to incarceration. The losses attributed to these components, respectively, increased 8.9 and 8.1 percent annually. In contrast, costs due to drug abuse-related deaths increased very little, primarily due to the fact that effective treatments are now available for HIV.

Table III-8
Productivity Losses, 1992 and 2002
(in millions of dollars)

Cost Components	1992	2002	Annual Change
Premature Death	$22,586	$24,646	0.9%
Drug Abuse-related Illness	$14,205	$33,452	8.9%
Institutionalization/Hospitalization	$1,477	$1,996	3.1%
Productivity Loss of Victims of Crime	$2,059	$1,800	-1.3%
Incarceration	$17,907	$39,095	8.1%
Crime Careers	$19,198	$27,576	3.7%
Total	**$77,432**	**$128,566**	**5.2%**

Source: Analysis by The Lewin Group, 2004.

In the next sections we address how we update each of these cost components.

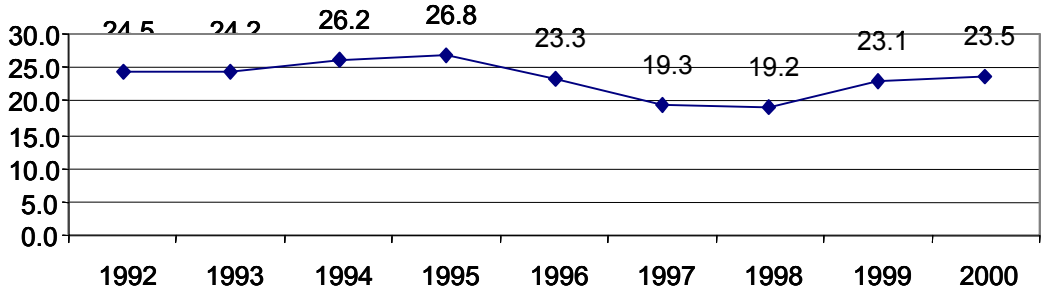
1. Premature Death

In the most recent year with mortality data (2000) a total of 23,544 deaths have been attributed to drug abuse, and costs have been projected at $24.6 billion in 2002. This amounts to an average loss of just over $1 million for each death, and reflects the expected lifetime value of productivity discounted at 3 percent. The previous estimate was for 1992, with $14.6 billion in losses from 24,476 deaths. This cost estimate was projected ahead to 2002 based on the rate of 5.7% change in 1999-2000.

The costs of premature mortality are somewhat different from all other costs included in this study. Mortality costs include the value of lost potential employment in the year of the death, as well as the discounted value of productivity over the remainder of their actuarially expected lifetime. This is similar conceptually to how the valuation of capital equipment or structures is done. Consequently, individuals (or equipment) that are early in their productive life have a much higher valuation than those that are further along in their productive life. This valuation method is termed the "human capital approach" and is the most commonly used valuation approach in cost of illness studies for health problems. The human capital approach yields cost estimates that can be considered "conservative," in the sense that they are substantially lower than estimates that come from the alternative valuation method called "willingness-to-pay" (or WTP; see Miller et al., 1998)[9].

The estimates in this update are generally comparable to prior estimates. However the national system for collecting data about deaths changed from the ICD-9 to the ICD-10 diagnostic coding systems[10] beginning in 1999. While there is general concordance between the old and new editions (see the annual totals from 1992 through 2000, Figure III-5), there is always some uncertainty about the implementation of a major reporting system change. Consequently it is difficult to know to what extent coding or real factors accounted for the increase in deaths attributed to substance abuse from 19,227 in 1998 (using ICD-9) to 23,070 in 1999 (using ICD-10) and 23,544 in 2000.

Figure III-5
Drug Abuse-Related Deaths, 1992- 2000
(patients in 000s)



Source: Mortality data from National Center for Health Statistics Web Site.

The costs due to premature death were re-estimated using the following components:

- The number of deaths by diagnosis, age, and sex;
- The percent of deaths attributable to drug abuse by diagnosis; and
- The estimated lost lifetime productivity per death by age and sex.

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[9] This alternative method recognizes that communities and families are generally willing to spend much more to treat or prevent life threatening illnesses than the benefited person is likely to earn over the remainder of their expected life. WTP studies variously put the value of a life/death in the range of $4 to $6 million.

[10] The ICD, or International Classification of Diseases is the standard coding system used across the world to record and collect mortality data. The ICD is coordinated by the World Health Organization.

This analysis used the same list of diagnoses and attribution factors that was used by Harwood et al. (1998) to calculate the baseline 1992 estimate (this can be found in Appendix B).[11] The initial list of diagnoses and attribution factors was obtained from the National Institute on Drug Abuse which developed the list for the Drug Abuse Warning System. The list includes diagnoses including abuse of and dependence on psychoactive drugs as well as accidental and intentional (i.e., suicide) poisoning by a range of drugs and medications, psychoactive and otherwise. The Harwood et al. (1998) study added TB, hepatitis B and C and HIV/AIDS to the list of diagnoses attributable to drug abuse and reviewed the literature to arrive at attribution factors..

Data on the number of deaths by age and sex were obtained for each cause of death from death certificate data compiled and published (via both hard copy and their Web Site) by the National Center for Health Statistics for 1992 through 2000. Tables B-9 and B-10 in *Appendix B* show the number of deaths and the attribution factor (the proportion of deaths attributed to drug abuse) for each diagnosis used in the calculations. The largest change in drug-related mortality from 1992 to 2000 was the decline in drug-related AIDS deaths from about 10,700 to 4,600.

The number of deaths for each age/sex category was multiplied by the estimated value of lifetime earnings. The original lifetime earnings table was obtained from Dorothy Rice (personal communication), a leading cost of illness researcher. The estimates for the expected value of lifetime earnings for 1992 are trended to future years based on the Bureau of Labor Statistics series on "Employer Cost for Employee Compensation, Civilian, All Workers, Total Compensation, Cost per Hour Worked." (U.S. Dept. of Labor, Bureau of Labor Statistics, web page for National Compensation Survey). The ECEC increased by an average of 3.0 percent annually between 1992 and 2002 and 4.1 percent between 1998 and 2002 (Appendix B-4).

The cost estimates for 2001 and 2002 are projections, because mortality data was not available for 2001-2002. The annualized increase between 1999 and 2000 was 5.7 percent. The number of deaths increased by 2 percent from 1999-2000 and the remaining 3.7 percent is slightly smaller than the increase in the ECEC.

2. Drug Abuse-related Illness

Individuals with medical problems may become disabled or otherwise have difficulty in getting or functioning in jobs, depending on the nature and severity of the health problem. There is evidence that this can happen with individuals with severe drug problems. This report projects that such productivity losses were $33.5 billion in 2002, an increase from $14.2 billion in 1992 and $23.1 billion in 1998. These costs have been projected to increase by 9.7 percent annually since 1998.

Analyses have found that individuals who have used drugs intensively enough to meet clinical criteria for drug dependence are less successful in the workforce than their peers, although other studies have found that drug users on average do not have adverse workforce outcomes. Analysis of the National Longitudinal Alcohol Epidemiology Survey estimated that about 3

[11] The definition of deaths attributed to drug abuse in this study is broader than the definition used by the CDC in its tabulation of "drug-induced" deaths.

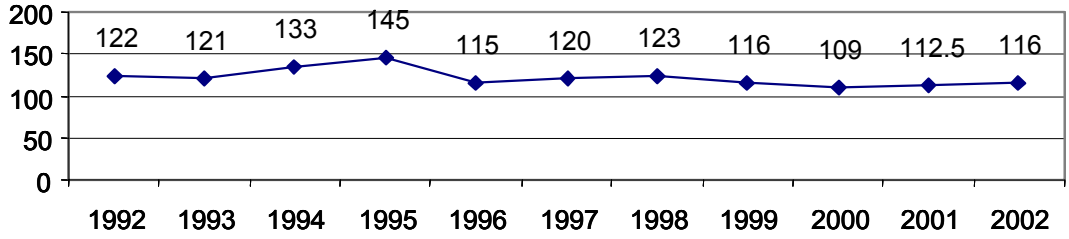
percent of the population age 18-64 (about 4.5 million persons) were or had previously been dependent on illicit drugs and that these individuals either had lower wages or higher rates of unemployment than their peers (Harwood et al., 1998).

This component was trended forward, adjusting for changes in wage increases using the ECEC (see above) and for real increases by the trend in the number of persons that had used cocaine or marijuana more than 100 times in their lives. Use on 100+ days increased by 5.2 percent annually between 1992 and 1998, according to the NHSDA. This measure has been discontinued since 1998, thus for this update the growth trend in this factor was projected forward. Note, however, that this measure is only a proxy for the number of persons that are or have ever been drug dependent—which the NHSDA and other major surveys did not estimate until late in the 1990s. The complexity of the analysis made it necessary to trend rather than re-estimate this component. It will be important to reanalyze this in the future, particularly given that the forecasting method yields a rate of increase that is materially higher than for most of the other cost components.

3. Institutionalization/Hospitalization

When drug abusers are in residential or hospital treatment facilities they are unable to work, and again this constitutes a loss of potential productivity, estimated at $2.0 billion in 2002. The 2002 N-SSATS survey of substance abuse treatment facilities estimated that 116,000 patients were in a 24 hour care facility on a given day, slightly below the 122,000 enrolled in 1998 (Figure III-6). Just over half of these patients were drug (as opposed to alcohol) abusers (see Table III-3, above).

Figure III-6
Substance Abusers in 24 Hour Specialty Care, 1992- 2002
(patients in 000s)



Source: Data from the N-SSATS and UFDS, SAMHSA Web Site.

The 2002 estimate was produced by adjusting the 1992 estimate for the change in the number of patients and change in hourly employee compensation (the ECEC, discussed above). This cost component increased by about 3 percent annually between 1992 and 2002, less than the increase in employee compensation, because enrollment in 24 hour care dropped fractionally.

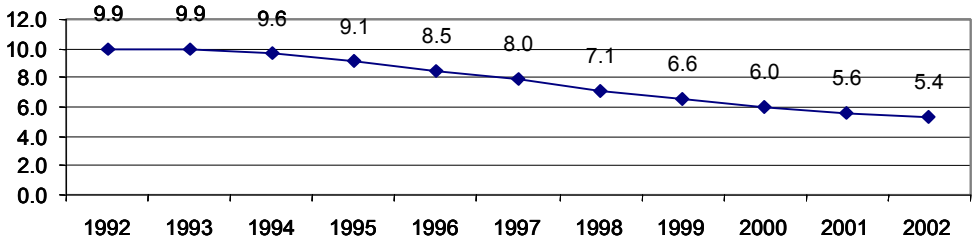
4. Victims of Crime

Crime victims often need to take time away from work and/or household responsibilities to recuperate or otherwise get affairs in order after a violent crime or theft. These losses of potential productivity are estimated at $1.8 billion in 2002, which is a slight reduction from the

$2.1 billion in such losses in 1992. These costs fell because violent and property crime rates fell by more than 50 percent in the past 10 years.

In the section on health costs (above), it was reported that in 2002 about 382,000 individuals suffered drug abuse-attributable violent crimes. Property crimes are much more numerous. This study attributes about 5 million property offenses in 2002 as offenses committed in order to pay for illicit drugs driven by drug disorders. Thus, this study estimates that over a quarter of the 17.5 million property offenses in 2002 may be attributable to drug abuse (annual data from the Bureau of Justice Statistics National Crime Survey are in Appendix B). Thus, in 2002 a total of 5.4 million violent plus property victimizations were attributable to drug abuse. The trend in this data from 1992 to 2002 is graphed in Figure III-7.

Figure III-7
Drug Abuse-Related Victimizations, 1992- 2002
(in millions)



Source: Lewin Group analysis of the National Crime Survey from the Bureau of Justice Statistics.

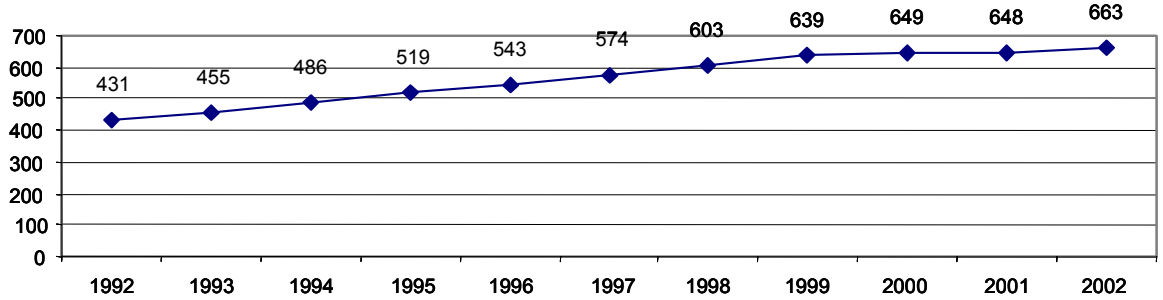
These calculations assume that the same amount of productive activity was lost by type of crime as in the estimates for 1992 (on average 4+ days for violent crime and 2 days for property crimes) and that victims had the same average demographic profile. The value of each day lost was estimated to be $133 in 1992, which was adjusted to $180 per day in 2002 based on the 35 percent increase in the ECEC from 1992 to 2002.

5. Incarceration

Incarceration of offenders for drug-related crimes is the largest cost component of drug abuse at $39 billion in 2002, or about 21.7 percent of total costs. These costs rose from $17.9 billion in 1992 to $30 billion in 2002. Costs increased by 8.1 percent annually between 1992 and 2002 due in almost equal measures to increases in the number of incarcerated drug offenders and wage increases.

In 2002 there were about 663,000 individuals incarcerated on drug-related offenses: 475,000 for violations of drug laws, and another 190,000 for drug-related property or violent crimes. This total had increased from 431,000 in 1992 (Figure III-8).

Figure III-8
Inmates Incarcerated for Drug-Related Offenses, 1992-2002
(in 000s)



Source: Analysis of BJS online data on prison and jail inmates.

Similar to the update factors derived for the lost productivity of crime victims, productivity lost due to incarceration is updated based on two factors. The number of individuals under incarceration for drug abuse-related crime in each year between 1992 and 2002 is calculated based on three components:

- The number of individuals under incarceration on June 30th of the year;
- The distribution of individuals under incarceration by primary offense; and
- The percentage of crimes of each type that are attributable to drug abuse (Table III-8, above).

The number of individuals under incarceration in local jails is reported by the Bureau of Justice Statistics as of June 30th of each year. The number of individuals in state and federal prison was reported as of December 31st of each year between 1992 and 2002. For this time period, the number of prisoners as of June 30th of a particular year is estimated by averaging the number of prisoners from the preceding and subsequent December 31st. Beginning in 1998 the number of state and federal prison inmates is reported in each year as of June 30th of the year.

The offense distribution of jail inmates is only available for 1989 and 1996. The offense distribution of state and federal prison inmates is only available for 1991 and 1997. The distribution of individuals under incarceration by primary offense has been calculated for the remaining years by assuming a constant trend between these years, and assuming no further change in the distribution through 2002. Appendix Table B-10 lists the percentage of local jail, state prison, and federal prison inmates by primary offense based on this assumption. Appendix Table B-11 provides detail for 1992 to 2002 on the number individuals under incarceration by offense and the attribution factors for drug abuse. Figure III-7 shows the number of individuals incarcerated for drug abuse-related offense between 1992 and 2002. The price change in the cost of lost productivity due to drug abuse-related crime is measured via the BLS's ECEC.

6. Crime Careers

Studies of addicts of expensive drugs such as heroin and cocaine entering treatment consistently find that on the order of a third of them rely on illegal activities, such as drug dealing and manufacture, property crime and commercial sex, to buy drugs and make a living. In this report, it is projected that crime career costs were $27.6 billion in 2002, an increase from $19.2 billion

in 1992. This may be the most tentative estimate in the study because of the enormous challenges in studying and quantifying the population of addicts.

The 1992 estimate was based on an estimate that there were about 600,000 heavy drug users that had dropped out of the legitimate labor market for a crime career, out of a total of about 1.7 million heavy drug users (Rhodes et al., 1995). The estimate that about 35 percent of heavy drug users pursued crime careers came from drug treatment populations—arguably among the most dysfunctional drug abusers.

The estimate of drug abusers engaged in crime careers has been trended forward using two different data series because the series from 1992 through 1998 (see Appendix Table B-4 for these estimates of "heavy drug users" published in the 2001 *National Drug Control Strategy*) was discontinued. The estimates from 1998 to 2002 trended down by 1.4 percent annually. This was based on Rhodes et al., (2001) study of trends in the number of hardcore cocaine and heroin users from 1988 to 2000. Note, however, the Rhodes et al., (2001) estimate of 3.6 million hardcore cocaine and heroin users is twice as large as the hard core heavy drug user population for 1992. This set of estimates has not accordingly doubled the crime careers estimate because it is necessary to look more carefully at the degree of involvement in crime of the population studied. It seems likely that the most recent Rhodes et al., (2001) estimate uses a less severe definition than the earlier studies, and that a smaller fraction of the 3.6 million hard core users are engaged in drug-related crime careers. The price change in the cost of lost productivity due to drug abuse-related crime has been measured via the BLS's ECEC (Appendix Table B-4).

C. Cost of Other Effects

There are two additional types of costs. These are the cost of goods and services used or lost due to drug-related crime and of certain administration costs of the social welfare system. The government spent over $167 billion on criminal justice services (police, courts, prosecutors, corrections) in 2001 (Bureau of Justice Statistics, 2004), increasing by about 6 percent annually between 1992-2001. Much of this is used for drug abuse. In this section we present estimates of how much of this is attributable to drug abuse, trended forward to 2002.

The costs associated with the social welfare system are different than might be expected. First, it appears that a relatively small fraction of social welfare beneficiaries get benefits *because of* their drug abuse. Second, in social cost studies only the cost of administering the program is counted, not the value of the resources distributed. Table III-9 displays the estimates of these costs for 1992 and 2002.

Table III-9
Cost of Other Effects of Drug Abuse, 1992 and 2002
(in millions of dollars)

Cost Components	1992	2002	Annual Change
Cost of Goods and Services Lost to Crime			
Criminal Justice System Public Costs			
State and Local Police Protection	$4,503	$9,785	8.1%
State and Local Legal Adjudication	$1,074	$2,336	8.1%
State and Federal Corrections	$7,495	$14,236	6.6%
Local Corrections	$1,333	$2,694	7.3%
Federal Spending to Reduce Supply	$4,126	$6,228	4.2%
Private Costs			
Private Legal Defense	$365	$647	5.9%
Property Damage for Victims of Crime	$193	$206	0.7%
Social Welfare	$337	$231	-1.8%
Total	**$19,426**	**$36,413**	**6.5%**

Source: Analysis by The Lewin Group, 2001.

The largest rates of increases among the components were for police protection and legal adjudication costs. These costs both increased at 8.1 percent annually during this period. These increases are due to growth in overall police protection and legal adjudication spending (which was about 6.5 percent annually) as well as growth in the proportion of that spending that we attribute to drug abuse. The percentage of arrests attributable to drug abuse increased from 12.9 percent in 1992 to 15.5 percent in 2001.

Two of the components had very low rates of increase or declined between 1992 and 2002. The cost of property damage for victims of crime grew less than 1 percent annually, and social welfare program administration costs decreased 3.7 percent annually. These two components represented only 1.2 percent of the cost of other effects in 1992.

1. Loss of Goods and Services Due to Crime

Crime-related costs include both the resources used by the public to address crime as well as private resources. These costs include costs for police protection, legal adjudication, corrections, federal funds for supply reduction efforts, and private costs for legal defense and property damage. Each of these components of cost is discussed in the following sections.

a) Criminal Justice System Public Costs

We address three types of public costs. These are police protection and legal adjudication, corrections costs, and the cost of federal efforts to reduce the supply of drugs.

(1) State and Local Police Protection, Legal and Adjudication Costs

Drug abuse-related police and legal and adjudication costs are estimated to be $9.8 and $2.3 billion, respectively, in 2002. This is primarily based on the fact that in that year 11.2 percent of all arrests in the US were for drug offenses and another 4.3 percent were estimated for drug-related offenses such as property crime to pay for expensive drug habits. These expenditures came out of projected 2002 total state and local police protection and legal adjudication and court costs of $63.1 and $30.1 billion, respectively. These estimates exclude federal funding provided to state and local criminal justice jurisdictions. Federal funding is accounted for in a later section, and with a greater degree of specificity.

These costs are calculated in a direct fashion: drug-related police costs are equal to the share of all arrests that are considered drug abuse-attributable or -related. In 2002 there were a total of 13.7 million arrests (U.S. Dept of Justice, Federal Bureau of Investigations, 2003), of which 1.54 million (11.2 percent) were on drug charges, and another 590 thousand (4.3 percent) were for offenses deemed attributable to drug abuse. These proportions were applied to spending on police and half[12] of the legal adjudication/court costs, respectively, to derive the cost estimates. The most recent data published for police and court costs were $53.4 and $25.3 billion respectively in 1999 (Bureau of Justice Statistics, 1993). These costs project in 2002 to $63.1 and $30.1 billion respectively, based on trends 1992-1999. When these percentages are applied to total police protection and legal adjudication/court costs the resulting costs attributable to drug abuse are listed in Table III-10.

Table III-10
Police and Legal/Adjudication/Court Costs, 1992-2002
(spending in billions of dollars, arrests in % of total)

	Actual								Projected		
Data Series	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Police, Total	$34.8	$36.7	$38.7	$41.1	$44.7	$47.7	$50.5	$53.4	$56.5	$59.7	$63.1
Courts, Total	$16.6	$16.9	$17.9	$19.2	$20.5	$21.6	$23.6	$25.3	$26.8	$28.4	$30.1
Drug Offenses	7.6%	8.3%	9.1%	9.8%	9.9%	10.4%	10.7%	10.9%	11.3%	11.6%	11.2%
Drug-Related	5.4%	5.3%	5.2%	5.1%	4.9%	4.8%	4.5%	4.3%	4.3%	4.3%	4.3%
Police, Drugs	$4.5	$5.0	$5.5	$6.1	$6.6	$7.2	$7.7	$8.1	$8.8	$9.5	$9.8
Courts, Drugs	$1.1	$1.1	$1.3	$1.4	$1.5	$1.6	$1.8	$1.9	$2.1	$2.3	$2.3

Note: 1992-1999 trend projected to 2002.
Source: Justice expenditures from Bureau of Justice Statistics; arrest data from *Crime in the United States*, Federal Bureau of Investigation.

(2) Corrections Costs

The cost of incarcerating drug offenders in 2002 was $16.9 billion. About 34.3 percent of inmates in state and federal prisons and 15.5 percent of those in local jails were incarcerated on drug offenses or other drug-related offenses. Total spending on state and federal prisons was

[12] The court costs are adjusted down by 50 percent in order to account for the cost of civil and other cases that do not involve arrests.

projected at $41.5 billion and $17.4 billion, respectively. Again, at the state and local level this only includes funding from their own sources, and excludes federal support.

Estimated costs are produced in a straight forward manner: drug-related corrections costs are equal to the share of all prisoners incarcerated on drug offenses or other drug abuse-attributable offenses times the total spent on corrections. In 2002 there were 1.35 million inmates in state and federal prisons (the one day census), of which 329 thousand (24.4 percent) were for drug offenses, and another 134 thousand (9.9 percent) were for drug-related offenses. Annual data on prison census, as well as offense charged is collected and reported annually (see Appendix Table B-11). In local jails the allocation of costs has been based on the proportion of arrests for drug offenses plus drug-related offenses (a total of 15.5 percent in 2002; discussed under police costs, above). The arrest distribution is used because jail populations are largely made up of arrestees that have not yet been adjudicated, and the assumption is made that the composition of arrestees and the jail census is similar. These proportions were applied to spending on state, federal, and local corrections to produce the estimates.

Corrections costs for local jails and state and federal prisons are published periodically by the Bureau of Justice Statistics in the Criminal Justice Expenditure and Employment Extract Program. There is a substantial lag in the publication of these estimates. The most recent published estimate published for state and federal and local corrections costs were $34.1 billion and $14.9 billion, respectively in 1999. These costs project to $41.5 billion and $17.4 billion in 2002 based on the trend from 1992 to 1999.

(3) Federal Funds to Reduce the Supply of Drugs

ONDCP reports annually in the *National Drug Control Strategy* on federal funds spent to reduce the supply of drugs. The detailed components of this funding for 1992 through 2002 are presented in the Appendix Table B-16. This was reported to be $6.3 billion in 2002. This had grown 4.2 percent annually since 1992, from $4.1 billion. Federal supply reduction spending is spread across nearly 20 distinct federal agencies, from the Drug Enforcement Agency ($1.6 billion) and Department of Defense ($1 billion) to the National Park Service, Fish and Wildlife Service and Agricultural Research Service (each less than $10 million). The values for 1992 through 2001 report actual spending. The 2002 funds indicate the appropriated amounts.

b) Private Costs

This study updates two types of private costs related to crime. The first is private legal defense costs. The second cost is the cost of property lost due to crime. The next two sections, respectively, describe how we update these two components.

(1) Private Legal Defense

It is estimated that the cost of private legal defense attributable to drug abuse was $647 million in 2002 (the costs of publicly provided legal aid are included under legal adjudication costs above). These costs are projected to have increased by 5.9 percent annually, from $365 million in 1992. This estimate is updated based on three factors:

- total annual revenue for legal services as reported by the Bureau of Economic Analysis;

- the percentage of lawyers practicing criminal law; and
- the percentage of arrests attributed to drug abuse.

The Bureau of Economic Analysis (2003) reports revenue for legal services annually. Annual revenue was $176.7 billion in 2001, and increased by 5 percent annually in 1992-2001. This projects to $185.6 billion in 2002. The criminal law section constituted 2.25 percent of members in 2002 (American Bar Association, 2003), down from 2.6 percent in the mid-1990s. Based on this, we assume that the overall percentage of lawyers practicing criminal law is 2.25 percent and is constant across 1999-2002. As discussed above, in 2002 drug-related arrests made up 15.5 percent of the total. Detailed data and calculations for 1992 to 2002 are in Appendix Table B-17.

(2) Property Damage due to Crime

This cost was estimated at $206 million in 2002. This estimate does not include the value of property that was stolen, but only the value of damaged property. Social cost estimates treat the value of stolen property as "transfers" of wealth from the victim to the thief, which are considered to be "offsetting" from the societal perspective, although this value is quite important in motivating public policy.

Property damage due to crime is estimated based on the following three components:

- Number of victimizations by offense;
- Percentage of victimizations for each offense attributed to drug abuse; and
- Estimated mean property loss per crime by offense.

The number of victimizations is reported annually in the National Crime Victimization Survey. There were 5.1 million drug-related victimizations in 2002 of types that sometimes involve property damage (theft, motor vehicle theft, household burglary, robbery and rape). This calculation is based on the attribution factors for crime already introduced.

Unfortunately, the estimated mean property loss per offense is estimated in the National Crime Victimization Survey infrequently. The estimates we have are for 1992, and average about $10 each crime for burglary and motor vehicle theft, $5 each for larceny and robbery and a dollar for rape. These values may seem low because only a very small proportion of offenses involve property damage. These have been trended to subsequent years based on the CPI for all services, about 28 percent between 1992 and 2002.

2. Social Welfare

The best available evidence available (reviewed in Harwood et al., 1998) indicated that drug abuse may only account for about 1 percent of social welfare payments and associated

administrative costs—in this study accounting for $281 million in administrative costs in 2002[13]. Several rigorous studies (United States General Accounting Office, 1994; Office of the Inspector General, 1994) found that drug abuse was rarely used as a formal reason for benefit eligibility. This study has trended the 1992 estimate forward based on trends in the value of Food Stamp benefits (Bureau of Economic Analysis, 2003). In fact, this estimate represents a decline from the $337 million in 1992, and a slight increase from the estimate of $249 million in 1998.

The primary reason these expenditures are low relative to 1992 is that effective January 1, 1997 drug abuse-related disorders no longer constituted an acceptable basis for Supplemental Security Income eligibility, and this value went to zero. Other changes in social welfare that became effective in 1997 significantly reduced payments to beneficiaries. Data on Food Stamp benefits came from the Bureau of Economic Analysis National Income and Product Accounts web site. Estimates were only available through 2001. The 2002 value assumes the 2000-2001 growth rate continued in 2002.

D. Reliability of Estimates

The estimates presented in this update should be considered comparable to the initial estimates developed in Harwood et al. (1998). We believe that the cost estimates give meaningful relative order of magnitude estimates that differentiate the relatively larger and smaller cost impacts of drug abuse in the United States. Also, these cost estimates can be used to make meaningful comparisons to the costs of other health problems. The costs which have been re-estimated can be considered comparable in quality to the original estimates. The costs which have been trended are somewhat less rigorous, although we believe that they still provide valid order of magnitude estimates of these respective impacts.

The objective of developing the estimates and of producing updates is to yield a meaningful indication of the absolute and relative economic impact of substance abuse. Updated cost estimates can be put in context with cost estimates for other health problems (e.g., alcohol abuse, heart disease, cancer, diabetes, mental illness) as well as current economic values such as the gross domestic product, government spending in total and for particular types of initiatives. The updated estimates make it possible to compare the relative magnitude of the cost impacts of the respective components.

In this section, we provide a qualitative assessment of the validity of each component.

a) Health Care Costs

Most of these costs are based on data or projections that are more current than that used in the 1992 cost estimates. However, only several smaller components have direct cost estimates that are as current as the year 2002 or even 2000. The largest number of health cost components have been trended forward from the most recent year with good data.

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[13] Although the value of social welfare benefits distributed is not counted in the social cost estimate, it can be relevant in policy discussions. Based on the prior analysis, it is projected that $2.8 billion in social welfare benefits were paid out due to drug abuse in 2002.

Current expenditure data are primarily available for items tracked in the *Budget Summary* of the *National Drug Control Strategy*. These components include spending on treatment by several federal agencies (including the Department of Veterans Affairs), federal funding for treatment and prevention research, and grants to states and localities for treatment and prevention services. These components totaled $2.4 billion in 2002.

The two largest health cost components--community-based specialty drug abuse treatment and HIV/AIDS treatment costs--had good estimates for 1997 and 1998, respectively. These estimates were then trended forward through 2002 based on indicators of changes in incidence, utilization and medical care service cost factors, respectively. Accordingly, the 2002 estimates for these should be reasonable indicators of the relative impact of these two factors.

Estimates of the 2002 costs for other medical consequences of drug abuse were derived based on application of trend factors.

b) Lost Productivity

Several of the components of lost productivity due to drug abuse were re-estimated for recent years. These components are productivity losses related to:

- Premature death (through 2000);
- Incarceration (through 2002);
- Victims of crime (through 2002); and
- Institutionalization for treatment.

For each of these components there was current or recent data on the incidence or prevalence of the problem in question, which is the most important element of the calculation. Accordingly, they should be highly reliable. The other main elements of the calculation are the valuation of lost productivity per person and the attribution fractions. The productivity factors have been trended forward based on the BLS-ECEC. This index is expected to be a good proxy for the actual change in the value of the time lost from productive activities. In this update the attribution fractions (e.g., what proportion of particular types of crimes are due to drug abuse) have mainly been assumed constant, since re-analysis is beyond the scope of this report.

The cost of premature mortality through 2000 was estimated based on detailed data on the number of deaths by diagnosis as well as age and sex, and this value was trended to 2002 based on the change between 1999 and 2000. Incarceration losses were estimated based on the number of persons incarcerated by type of crime for each respective year. Productivity losses related to victims of crime was based on the number of victimizations by type of crime weighted by the estimated number of days of productivity lost for each type of crime. Finally, there were data for 2002 of the number of persons enrolled in 24 hour treatment settings.

The valuation of lost time for most of these components, (except for premature mortality), assumes that the age and gender distribution of persons affected has remained the same. This is a reasonable premise, given that the demographic characteristics of populations (e.g., drug abusers, arrestees, prisoners, crime victims) change very slowly over time.

Lost productivity due to crime careers and drug abuse-related illness are likely to be less accurately measured than the other components of lost productivity, or perhaps any other components of cost in this study. This is primarily because these costs are the most difficult to measure. The analysis requires data from "hidden populations" about illegal and stigmatized behaviors, which is very difficult to develop reliable information about. Despite the data challenge, the original estimates were undertaken using the best data available because the calculations can give us some indication of the severity and order of magnitude of these problems. The trend estimates are confronted with the same challenges. The data series used to update or project these estimates are believed to be meaningful indicators of trends in these costs over time, however it will be necessary to re-estimate these costs in the future.

The point estimates and general trends in these components should be used with caution.

c) Other Effects

Most of the components of the cost of other effects were re-estimated for their primary components and can be considered as reliable as the original estimates. These include the following components:

- Criminal justice system costs (i.e., police protection, legal adjudication, and corrections);
- Federal spending to reduce the supply of drugs; and
- Property loss by crime victims.

Criminal justice system costs are based on current data such as arrests differentiated by charge, and offenders under supervision, also differentiated by charge, as well as total criminal justice system expenditures. The former types of data are published with little lag. The expenditure data come from surveys performed by the Bureau of Justice Statistics through 1999. The trends in these costs after 1999 were based on average annual changes over the prior 6 years.

Estimates of federal spending through 2002 to reduce the supply of drugs were obtained from the ONDCP *National Drug Control Strategy Budget Summary* (various years).

The real cost of property loss to crime victims is also recalculated using current data on victimizations. However, values for property loss per crime have been trended forward from the 1992 estimates based on the CPI for all services. This estimate, as well as the estimates of health care and lost productivity costs of crime victims are somewhat less reliable because the impact and costs on victims per crime have not been re-analyzed by BJS since the early 1990s. Thus these factors have been trended forward using the CPI. In addition, the National Crime Survey has been redesigned since 1992, with uncertain effects on the cost estimates.

Two components of the cost of other effects are less accurately projected. These are the costs of private legal defense and social welfare costs. Data on total annual receipts for legal services were obtained through 2001. However, as for the original estimate, the portion of this spending that is attributable to drug related crime can only be estimated indirectly. Trends in social welfare administration expenses are projected by trends in food stamp expenditures (available through 2001). These trends may not be highly correlated, given the recent major welfare reforms.

d) Summary

Overall just over half of the costs estimated for 2002 are likely to be very reliable. The main components that should be used with caution are:

- Productivity losses for drug abuse-related illness; and
- Productivity losses related to crime careers.

The general magnitude of the estimates of these components should be accurate. However, the point estimates and the trends from year to year for these components should be used with caution.