

The Impact of Substance Abuse on Federal Spending

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THE USE OF EPIDEMIOLOGY IN PUBLIC POLICY FORMULATION

The purpose of this chapter is to demonstrate how epidemiologic research can be a powerful tool in estimating the costs of substance abuse to society.

Traditionally, epidemiologic studies have provided information on how to develop and target interventions aimed at preventing and curtailing the spread of a specific disease. But epidemiology may be used to examine a risk factor in terms of more than simply the etiology of a disease. For example, by studying the effects of a single risk factor on multiple diseases, the impact of that factor on overall healthcare costs or government spending may also be quantified.

This notion is extremely applicable with respect to estimating the full impact of substance abuse on society. Much epidemiologic evidence already exists on the relationship between smoking, drinking, the use of drugs, and adverse health outcomes. Already, this research has led to changes in public policy, from bans on smoking in public places due to mounting evidence of the impact of passive smoke, to greater enforcement of drunk driving laws resulting from the evidence linking drinking to traffic accidents.

By combining studies looking at each of these substances as risk factors for a variety of diseases, a more complete picture of the heavy toll that substance abuse takes on society can be seen. Doing this will help provide evidence of why, ironically, greater investment in substance abuse prevention and treatment is even more necessary as efforts are intensified in other areas to cut government spending.

PAST RESEARCH HAS LAID THE FOUNDATION

Considerable research already exists, particularly as it relates to the impact of cigarette and alcohol use on the cost of healthcare.

Costs of Smoking

Quantifying the costs of smoking has been a major public health issue since the 1960s. Annually, the Surgeon General issues a report on smoking and health that summarizes all current epidemiologic evidence on the relationship between smoking, disease, and death. The most noteworthy of these was *Reducing Health Consequences of Smoking: 25 Years of Progress* (U.S. Department of Health and Human Services [DHHS] 1989), issued in 1989, which reported smoking attributable fractions (SAFs) for 10 selected causes of death using data collected in a 4-year, 50-State study conducted by the National Cancer Society. These SAFs represent the proportion of deaths for a given disease that could have been avoided if cigarette smoking were eliminated.

Many economic cost studies have relied on these estimates to calculate the number of smoking-attributable deaths for specific regions and the number of years of potential life lost as a result of smoking. Some have also employed these mortality statistics to estimate hospital utilization and costs. However, mortality SAFs, which measure smokers' risk of dying of a disease, are different than morbidity SAFs, or smokers' risk of contracting a disease. Thus, mortality SAFs cannot be used reliably for estimating morbidity or hospital costs.

Recognizing the shortcomings of using mortality SAFs in estimating healthcare costs, Rice and colleagues (1990) developed a different methodology for identifying smokers' attributable risk of utilizing health services using National Health Interview Survey (NHIS) data. For people who had neoplastic, circulatory, and respiratory diseases, Rice analyzed the use of hospital days and physician visits by smokers compared to nonsmokers by age and sex. From these comparisons, Rice was able to calculate morbidity-attributable risks, which were then applied to hospital and outpatient expenditures for these diseases to estimate annual smoking-related healthcare costs. While not as disease-specific as the mortality-based studies, Rice's methodology set a standard for estimating annual healthcare costs associated with smoking.

In addition to these point-in-time estimates, others have studied the lifetime costs of smoking. For example, Manning concluded that the cumulative impact of excess medical care required by smokers at all ages outweighs the savings to these programs resulting from the shorter life expectancy of smokers (Manning et al. 1991). Using survey data from the National Medical Expenditures Survey (NMES) and NHIS, Hodgson broke down the differences in expenditures between smokers and nonsmokers revealing that, over the long term, payers that cover the younger age groups (i.e., private insurers and medicaid) bear a greater burden of smokers' costs than does medicare, for example. These studies have current relevance in countering the arguments that measures designed to reduce smoking (e.g., increased cigarette tax) will, in fact, increase healthcare costs.

Other studies have estimated the costs of specific diseases (Harwood et al. 1984), specific subpopulations (Phibbs et al. 1991; Rivo et al. 1989), distinct hospital departments (Hauswald 1989), State health expenditures (Rice and Max 1992; Spiegel and Cole 1990) associated with one or more substances, or for specific payers (Adams et al. 1993). Most of these studies employed some version of the Rice or Harwood (see below) methodology. The study by the National Center on Addiction and Substance Abuse (CASA) also starts with Rice's and Harwood's previous work, incorporating both the concept of disease-specific risks attributable to substance abuse and the marginal effects of substance abuse as a secondary diagnosis.

Alcohol and Other Drugs

At present, the most comprehensive studies on the economic costs of alcohol and other drug use are those commissioned by the Alcohol, Drug Abuse, and Mental Health Administration in the 1980s. Cruze and colleagues (1981) and Harwood and colleagues (1984) studied the combined cost impact of alcohol and drug abuse and mental illness to society. Both studies, conducted by the Research Triangle Institute (RTI), estimated the total economic impact of alcohol and drug abuse and mental illness (ADM) disorders, including the direct costs of diagnoses and treatment of patients suffering from these illnesses, indirect costs associated with loss of earnings due to reduced or lost productivity, premature death, and other related costs.

In their estimates of treatment and costs, the RTI studies refined previous estimates by "identifying specific diseases and illnesses that are related to alcohol, drug abuse, and mental illness (ADM) and

allocating costs based on the proportions of the illnesses or diseases that are attributable to ADM” (Cruze et al. 1984). However, these attributable proportions were almost solely alcohol related: no drug-related illnesses were included. Furthermore, for some diseases, estimates ranged from 0.2 percent to 70 percent. Nevertheless, this work did provide an analysis of the alcohol literature and established a clear link between epidemiologic research and cost analysis.

In 1988, Rice and colleagues updated Harwood’s cost analysis (Office of Technology Assessment 1985). Like Harwood, Rice attempted to estimate the total societal costs of alcohol, drug abuse, and mental illness (direct healthcare costs only accounted for 24 percent of these total costs). For estimating direct healthcare costs, however, Rice did not use the attributable percentages employed by Harwood. Instead, a methodology was created for addressing issues of comorbidity. Using the National Hospital Discharge Survey (NHDS), Rice first estimated the cost of alcohol, drug, or mental illness as a primary diagnosis following Harwood’s model. Then, recognizing that secondary diagnoses of substance abuse complicate the treatment of other diseases and thus add to hospital costs, Rice also calculated the additional days of care reported for *all* primary diagnoses that had a secondary ADM diagnosis. Rice acknowledged at the outset that the resulting estimates were low, restricted by the information reported on the medical records. In fact, many studies have documented that underreporting of secondary diagnoses is common, especially for conditions such as substance abuse, which do not require direct treatment but contribute to longer stays and are considered embarrassing by the patient.

BUILDING ON PAST WORK

Past studies have already provided considerable evidence on the costs of tobacco, alcohol, and drugs to the country’s healthcare system (Rice et al. 1986, 1990, 1991; Harwood et al. 1984; Rivo et al. 1989; Adams et al. 1993; Cruze et al. 1981; Office of Technology Assessment 1985; Shultz et al. 1991*a, b*; Berry and Boland 1977). Some of these studies have applied an epidemiologic approach, identifying etiologic fractions that estimate the percentage of cases of a given illness attributable to one or more of these substances (Rice et al. 1986, 1990; Harwood et al. 1984; Adams et al. 1993; Cruze et al. 1981). Other studies have addressed the impact of only one substance on morbidity (Rivo et al. 1989; Hauswald 1989; Adams et al. 1993; Shultz et al. 1991*a, b*), while others have focused on the impact of a given substance on a specific

disease or medical condition (e.g., alcoholic cirrhosis) (Adams et al. 1993). Finally, researchers have also quantified the impact of substance abuse on the costs to a specific payer (such as medicare) (Center on Addiction and Substance Abuse 1993, 1994; Fox et al. 1995).

Building on this previous work, particularly that of Rice and Harwood (Rice et al. 1986, 1990; Harwood et al. 1984; Cruze et al. 1981), CASA at Columbia University initiated a comprehensive study in 1992 to document the full extent to which all forms of substance abuse contribute to the costs of the healthcare system.

While relying heavily on the prior work, the CASA study goes beyond it in a number of ways. For example, CASA's study quantifies in a single report the total cost of substance abuse in all its forms (tobacco, alcohol, and licit and illicit drugs). It also enlarges earlier efforts to incorporate findings from epidemiologic research in healthcare cost analyses and uses morbidity-related attributable risks. CASA conducted a critical review of the medical and epidemiologic literature linking substance abuse as a risk factor for a wide variety of medical conditions. Based upon the best available epidemiologic studies, CASA's work updates and expands the information available on the proportion of patients who acquired diseases or conditions as a result of the abuse of alcohol, drugs, or tobacco. Combining this review and consultations with physicians and researchers knowledgeable in this area, CASA was able to estimate the magnitude of this problem and its associated costs as they affect the overall healthcare system, public and private payers, and individual services.

The first phase of this project, which examined the extent to which medicaid hospital costs are attributed directly or indirectly to substance abuse, was completed in July 1993 (Center on Addiction and Substance Abuse 1993). This phase found that at least 1 in 5 hospital days billed to medicaid could be linked with the use or abuse of alcohol, tobacco, or drugs. An additional report was released in May 1994 on the impact of substance abuse on medicare hospital costs (Center on Addiction and Substance Abuse 1994). This report, which documented an even stronger influence (1 in 4 hospital dollars) upon medicare costs, also demonstrated the large toll that cigarettes take on people over age 65. More than 80 percent of the medicare hospital costs that were attributable to substance abuse were related to the use of cigarettes and other tobacco products.

But these early phases of CASA's research dealt only with the impact on medicaid or medicare, and focused exclusively on inpatient hospital costs. This chapter not only examines the impact of substance abuse on the total attributable costs of all services including physician care, long-term care, and prescription drugs, but also identifies its costs to all Federal health entitlement programs. In addition, using in some cases a similar approach (i.e., for Social Security Disability Insurance [SSDI]) and, in others, a more prevalence-based method, the authors have estimated the costs of substance abuse on other Federal entitlement programs as well.

METHODOLOGY

The following is a brief description of the methodology employed by CASA in making these estimates.¹

Substance Abuse Impacts Healthcare Costs in a Variety of Ways

In order to estimate healthcare costs associated with substance abuse, costs have been divided into four general categories:

1. Direct treatment of substance abuse.
2. Treatment of medical conditions totally attributable to substance abuse.
3. Treatment of medical conditions for which substance abuse is a major risk factor.
4. Treatment of medical conditions for which the length of stay was extended due to complications arising from a secondary diagnosis of substance abuse.

In general, for each provider group (i.e., inpatient hospital, physician, nursing home, etc.), the costs were calculated by multiplying the numbers of units of service or their costs (e.g., hospital days, physician visits, prescriptions) by the percentage attributable to substance abuse for each disease or medical condition.

The following paragraphs describe how costs were calculated for each of the four categories enumerated above.

Direct Treatment. If discharge or encounter involved, based upon the diagnostic name given to the ICD9 code, a primary diagnosis of either substance dependence or substance-induced psychosis or poisoning, the entire cost was assumed to be for the direct treatment of the substance abuse problem. For these diagnoses, 100 percent of the units of service were attributed to substance abuse.

Treatment of Diseases Totally Attributable to Substance Abuse. In category 1, the costs were specifically for the direct treatment of a substance abuse problem. For the second and third categories, the costs were identified for those cases where a disease or health problem (e.g., trauma) was caused by the use or abuse of a substance, but did not directly involve a substance abuse problem. A case may have had substance abuse as a secondary diagnosis, but this treatment was for the primary diagnosis. In category 2, the costs are those for which the diagnosis specifically mentioned a substance by name (e.g., alcoholic cirrhosis), a diagnosis that the National Institute on Alcohol Abuse and Alcoholism (NIAAA) considers as solely attributable to alcohol (e.g., pellagra), or for which a secondary diagnosis of substance abuse is involved in 100 percent of the cases reported (e.g., esophageal varices). Since all of these cases could be attributed to abuse of either drugs or alcohol, 100 percent of the units of service were considered to be related to substance abuse.

Treatment of Diseases When Substance Abuse Is a Major Risk Factor. From an extensive review of epidemiologic research, CASA identified 70 conditions and diseases that include substance abuse as a major, but not the exclusive, risk factor. These involve diseases such as lung cancer and low birthweight associated with smoking; accidents and cardiovascular diseases associated with alcohol use; and strokes in people under age 65 or acquired immunodeficiency syndrome (AIDS), both of which are associated with drug use. The prospective, population-based, or case control studies used for this analysis often calculated (or provided relative risks that allowed CASA to calculate) a population-attributable risk (PAR) for a specific substance and disease. PAR is an epidemiologic term defining the percentage of cases of a given illness that could be prevented if, in this case, the use of the substance were eliminated.² In other words, the PAR for cigarettes and lung cancer is 87 percent, indicating that 87 percent of lung cancers could have been prevented if there were no cigarette smoking. Based on the authors' research of the epidemiologic literature, a PAR was assigned for each of the 70 substance abuse-related diseases. With the help of a medical records coder, the diagnostic codes (ICD9)

associated with these diseases were then identified. For any conditions that involved these primary diagnoses, the associated PAR for that disease was multiplied by the total number of units of service (i.e., hospital or nursing home days, physician visits, prescriptions) reported for that diagnosis to determine the extent to which that diagnosis was attributable to substance abuse.

Two health problems, AIDS and birth complications, proved particularly difficult with respect to estimating their costs resulting from substance abuse. Determining AIDS costs was difficult, given that an AIDS-related condition (such as pneumocystosis) is often the primary diagnosis and AIDS is only listed secondarily, if at all. For example, only 10,000 medicaid recipient discharges listed AIDS as the primary diagnosis, clearly an underestimate. To complicate matters further, even among the cases in which AIDS was a secondary diagnosis, a person's hospitalization may have nothing to do with AIDS (other than to complicate the treatment); e.g., someone may be hospitalized for appendicitis and only coincidentally have AIDS. Thus, these costs could not be attributed to AIDS or substance abuse. To get a more precise estimate of AIDS-related hospital days, the authors identified the primary diagnoses for all medicaid recipient discharges that listed a secondary diagnosis of AIDS. Then, consulting with physicians specializing in AIDS care and research, the AIDS-related primary diagnoses were selected. These AIDS-related hospital days or other health-related care were added to those for patients with a primary AIDS diagnosis and then multiplied by the percentage of cases attributable to intravenous drug use as determined by the Centers for Disease Control and Prevention (CDC) AIDS Surveillance to determine substance abuse-related AIDS days.³

Birth complications also required special analysis as they related to the number of incremental hospital days for substance-exposed babies rather than the percent of attributable births. Since the abuse of a substance is not responsible for the admission (i.e., the birth itself), but only for certain associated complications, the marginal impact of those complications needed to be calculated. For alcohol, the number of additional days was calculated by comparing the length of stay for births when an alcohol-related diagnosis was indicated on the NHDS as a secondary diagnosis with those for which there was no such diagnosis. With respect to the impact of smoking, a PAR was applied to low birthweight babies and the number of days was calculated using the methodology described above. However, the length of stay for a normal neonate (2.3 days for each discharge) was deducted from this since, absent the

complication, this number of days still would have been used. For cocaine-exposed babies, costs related to birth complications were estimated based upon both a study by Phibbs and colleagues (1991) of the added days associated with babies exposed to cocaine and other drugs and a study from Los Angeles (Health Care Financing Administration [HCFA] 1990) on the added use of intensive care. The results of the Phibbs study (based on a multivariate analysis) estimated that, in the case of a baby exposed to cocaine, the average length of stay was 11 days longer than for a baby without this exposure. In 1988, the Los Angeles research estimated that 30 percent of these children required intensive care at a cost of \$1,500 per day. To estimate the incremental days attributable to drugs, the total number of births billed to medicaid that involved maternal cocaine use (8 percent of all births) was multiplied by 11 days. A cost per day of \$750 was used, except for 18 percent of the attributable days when a neonatal intensive care unit (NICU) cost of \$1,500 was applied. (These were 1988 costs which were inflated to 1995 levels using the medical care component of the CPI.)

Additional Days for Medical Treatment Due to Substance Abuse Complications. In addition to being a risk factor for certain specific illnesses, substance abuse can also complicate any illness and add to the patient's length of stay. For example, substance abuse can compromise the immune system, reducing the body's ability to fight infection. Some substance abuse patients (e.g., with delirium tremens) need to be stabilized before doctors can treat the primary medical condition. To estimate the cost of substance abuse comorbidity, the difference in lengths of stay for a given diagnosis for patients with and without substance abuse as a secondary diagnosis, controlling for age and sex, was computed. The total number of incremental days identified in this way was counted as substance abuse-related days.⁴

Once the PARs were calculated, costs attributable to substance abuse could be estimated. For each payer (i.e., medicare, medicaid, other government programs), the substance abuse-attributable costs (SACs) for a given service i (e.g., inpatient care, physician services, ER) were calculated using the following formula:

where P_d is the PAR for a given diagnosis d ; U_{id} is the number of units of service (e.g., days, discharges, visits, or prescriptions, depending on the service) for a given service pertaining to diagnosis d , and E_i is the amount of expenditures for a given service and payer group. Data on utilization of different services were drawn from the NHDS, National Medical Care Expenditure Survey, National Nursing

Home Survey, and the National Ambulatory Care Survey. Expenditures were based on those reported by the fall 1994 *Health Care Financing Review*.

Aggregating these SACs for each type of service for a specific payer group, and dividing by the total expenditures for all of those services in that payer group, an aggregate attributable risk (AAR) for that payer was calculated [$AAR = (\% SAC_i) / (\% E_i)$]. This AAR was then applied to other expenditures (i.e., dental care, durable medical products, and other professional services and personal healthcare) to calculate the proportion of those services attributable to substance abuse. This was added to the aggregated SAC to obtain a total SAC [$\% SAC_j$] for all services for that payer group.

An exception to this methodology was veterans' healthcare, for which an overall attributable risk was calculated using data from a study by the Department of Veterans Affairs (DVA) (1994). In addition, the percentage of costs in psychiatric hospitals attributable to substance abuse was derived from data reported by the National Association of Psychiatric Health Systems (1993). Overall costs for care in these facilities was obtained from the American Hospital Association (American Hospital Association 1994).

For SSDI costs attributable to substance abuse, a similar approach was used. In this case, based on statistics from the *Social Security Bulletin* (Social Security Administration 1994), the distribution of disease categories leading to eligibility was derived. Then the relevant attributable risks (as used above) for each of these disease categories were applied to the number of individuals in those categories. In addition, based upon data from the Social Security Administration, 43,000 beneficiaries became eligible for SSDI specifically due to a primary diagnosis of substance abuse. Aggregating these substance abusers to those eligible due to diseases attributable to substance abuse (as derived from the disease categories) and dividing this sum by the total SSDI caseload provided a percentage of cases—and thus costs—that were attributable to substance abuse. The assumptions that went into calculating other entitlement costs are explained as part of the Results section below.

It should be noted that these estimates of the impact of substance abuse on healthcare costs are likely to be lower than the actual costs. First, while attempting to pull together all available epidemiologic research on the health effects of substance abuse, more research is needed. The authors' results reflect only the current state of the art in this area.⁵ Second, studies reveal that

identification and reporting of substance abuse problems by medical practitioners is poor. For example, estimates of underreporting of substance abuse as a secondary diagnosis run as high as 60 percent. For reasons of confidentiality and concern over insurance reimbursement, physicians are reluctant to record substance abuse unless it relates directly to the primary diagnosis or the treatment plan. Thus, the incremental costs attributable to comorbid substance problems are low. Third, there is little identification of either tobacco use or the abuse of prescription medications on the medical record; thus, the authors' estimates include only the complications of alcohol and illicit drug abuse. Fourth, with the exception of neonatal care, these numbers do not take into account the added costs for intensive care associated with substance abusers who, research shows, require a greater intensity of services.⁶ Finally, the authors' estimates do not include general hospitalization costs of caring for people who join the medicaid rolls and benefit from its coverage because of job loss, disability, or poverty related to substance abuse.

RESULTS

Before discussing the specific results, it may be helpful to put this in the perspective of what is meant by entitlement spending. A report by the Bipartisan Commission on Entitlement and Tax Reform (1994) stated that spending for entitlement programs almost doubled between 1983 and 1993, from \$360 billion to nearly \$700 billion. The commission had been created to "resolve the imbalance between government's entitlement promises and the funds it will have available to pay for them" (Bipartisan Commission on Entitlement and Tax Reform 1994).

Definitions of what constitutes an entitlement program can vary. For the purpose of this chapter, an entitlement is any program to which an individual is entitled to the benefits if he or she meets the statutory definition of eligibility. In other words, in the same way that an individual over the age of 65 who has worked for the required number of quarters is eligible for Social Security and medicare, so too are active military or civil service personnel entitled to health and disability benefits, and veterans with service-connected disabilities can receive health or compensation benefits. In all of these cases, in order to reduce funding, statutory change would be required to alter either the eligibility criteria or benefit levels. This is quite different from a discretionary program, in which funding is not tied to explicit eligibility and benefit criteria.⁷

While this is a slightly broader definition of entitlements than used by the Federal Government, the differences are relatively small with respect to the overall problem.

Regardless of the specific definition used, reducing the size of entitlement programs is a bipartisan concern. In fiscal year (FY) 1995, Federal expenditures for welfare (including AFDC, SSI, and food stamps); health (including medicare, medicaid, veterans' health, and other Federal health programs); retirement (including Social Security, veterans pension, and civil service and military retirement⁸); disability (disability insurance, coal miners black lung, and veterans compensation); and unemployment compensation will total \$835 billion or 55 percent of the Federal budget (figures 1 and 2). Of these, retirement programs will account for about \$366 billion or 44 percent of the total expenditures for entitlements, and health and disability programs for \$377 billion or 45 percent.

While much of the public's attention to entitlements is focused on welfare programs, these actually represent a very small portion (4 percent) of overall Federal outlays and 8 percent of all Federal entitlement payments. This amount not only includes the AFDC program, but SSI and food stamps as well. The single largest entitlement spending category is Social Security and other retirement programs for which eligibility is determined principally by age and years of employment. Thus, the size of these programs is not directly affected by substance abuse. On the other hand, Federal health and disability programs

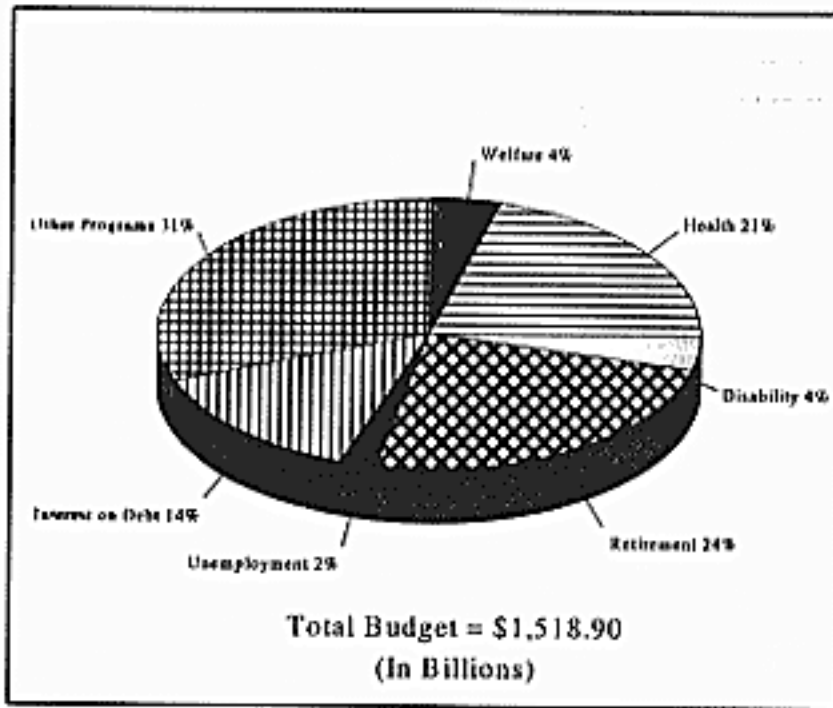


FIGURE 1. *The 1995 Federal Budget.*

SOURCE: Budget of the United States Government, Fiscal Year 1995.

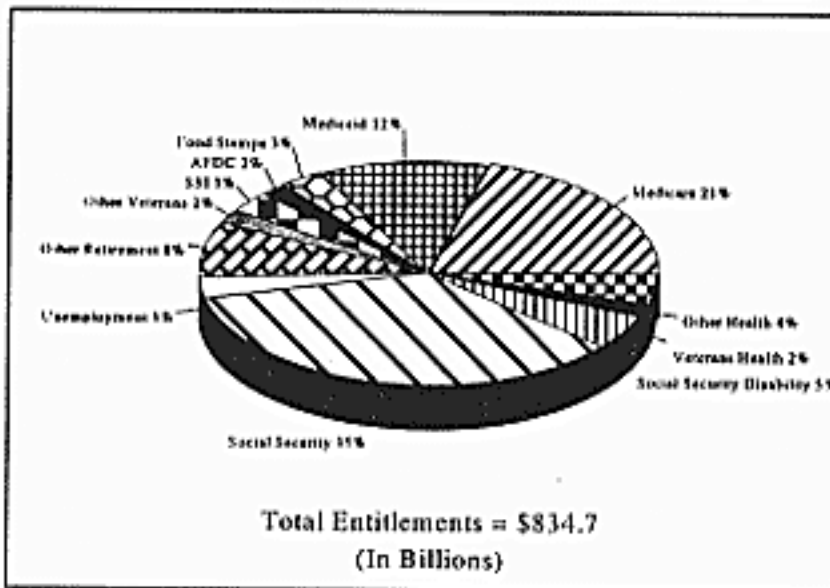


FIGURE 2. *1995 expenditures for Federal entitlement programs.*

SOURCE: Budget of the United States Government, Fiscal Year 1995.

account for more than 45 percent of all entitlement spending, and substance abuse contributes significantly to the size of both of these types of programs. By identifying epidemiologic research on the relationship between the abuse of tobacco, alcohol, or other drugs and specific diseases and applying these relationships to national databases,⁹ the authors were able to determine the extent to which substance abuse contributes to the costs of Federal healthcare and disability benefits programs. It should be noted that, while similar relationships may hold between substance abuse and other disability programs (such as Civil Service Disability), no detailed data were available that would have allowed calculation of the impact of substance abuse on those programs. Given this limitation, therefore, the costs accounted for in this report relating substance abuse to disability programs are understated.

As can be seen in table 1, the total impact of substance abuse on Federal entitlement programs can be conservatively estimated to be more than \$77 billion. Of this, \$66.4 billion represents costs directly attributable to substance abuse and \$11.2 billion for expenditures that cannot be saved unless substance abuse is addressed as part of reform efforts. The amount of Federal dollars expended either directly or indirectly as a result of substance abuse would account for nearly 10 percent of total spending on entitlements and 5 percent of the overall Federal budget for FY 1995.

The first column of table 1 reports the costs of health entitlement coverage for conditions attributable to tobacco, alcohol, and other drugs, as well as income assistance provided to individuals who became disabled solely as a result of substance abuse or substance abuse-related illnesses. Health costs include the costs of treating diseases attributable to tobacco, alcohol, and drugs. Disability insurance costs include income benefits paid to individuals who became disabled by smoking-related illnesses such as coronary heart disease or by alcohol or drug abuse. For SSI, this first column includes Federal dollars spent on individuals who became eligible for SSI specifically *because* of their alcohol or drug disability.

Of the \$66.4 billion directly attributable to substance abuse, the bulk is spent on health entitlements, particularly medicare and the Federal portion of medicaid. The SSI costs included in this category (\$442 million) are those benefit payments for the 90,000 disabled beneficiaries whose SSI eligibility is reported to be based solely on a drug- or alcohol-related disability (U.S. General Accounting Office 1994).¹⁰ It should be

TABLE 1. *The impact of substance abuse on Federal health entitlement programs.*

Entitlement program	(\$ in billions)		
	Costs directly related to substance abuse	Costs indirectly related to substance abuse**	Total impact
Health	\$60.3	—	\$60.3
Disability insurance	5.6	—	5.6
SSI	0.5	3.2	3.7
AFDC	*	3.1	3.1
Food stamps	*	4.9	4.9
Total	\$66.4	\$11.2	\$77.6

KEY: * = There is inadequate data from which to estimate how many individuals become eligible solely because of a substance abuse problem; ** = These costs are benefit payments to individuals who are regular alcohol or drug users, i.e., those who use drugs at least monthly and/or binge drink (consume five or more drinks in one sitting) at least weekly.

noted that the disability costs cited in this figure include only SSI and DI; they do not include substance abuse-related costs to other disability programs, such as Civil Service or veterans' disability, since the data needed to reliably estimate those costs were not available.

In addition, it is impossible to estimate how many recipients of AFDC and food stamps became eligible because of a substance abuse problem. However, the totals in the second column are based on the proportion of individuals on public assistance who admit to regular alcohol or drug use¹¹ and who, as a result, may need treatment before they can complete job training and/or be placed in a job, so that they might leave the public assistance rolls. With the passage of welfare reform legislation, this has become particularly important.

While these individuals did not necessarily get on welfare because of substance abuse, they are likely to stay on AFDC or SSI unless they receive adequate and appropriate treatment. As both the GAO report (General Accounting Office 1994) and that of the DHHS inspector general (DHHS 1994) noted, substance abuse is a serious barrier to effective job training and employability. Currently, nearly 1 in 5 recipients of AFDC and food stamps and almost 30 percent of SSI recipients (18 to 44 years old) report regular alcohol and/or drug use.¹² If efforts to get these individuals off public assistance through education, job training, and employment placement programs do not

include a substance abuse treatment component, it will be very difficult for these recipients to enter and remain in the workforce. Providing substance abuse treatment may not guarantee that these individuals will get off public assistance, but not offering this service will guarantee that it will be impossible for them to become or remain employable. If all of these individuals were treated successfully and left the public assistance rolls, then up to \$11.2 billion could be saved in FY 1995 alone. Over the next 7 years, the time during which most budget proposals anticipate balancing the budget, this amounts to over \$100 billion. If substance abuse is not addressed during this time, it may be impossible to realize any of these potential savings. This is particularly critical given the recent passage of welfare reform.

The single largest area of expenditures is for healthcare. As shown in table 2, nearly 1 out of every 5 dollars spent on Federal healthcare entitlements is attributable to the use and abuse of tobacco, alcohol, and other drugs. In FY 1995, these substance abuse-related costs accounted for \$60.3 billion of medicare, medicaid, veterans' health benefits, and other major health entitlements. medicare substance abuse-related costs accounted for \$31.9 billion, or more than half of the total; medicaid represented nearly one-third of substance abuse-attributable costs.

Previous reports released by CASA (1993, 1994) revealed the proportion of medicare and medicaid hospital costs that are associated with substance abuse. The estimates in table 2 reflect spending not only for hospital care but for all healthcare services covered by these benefit programs, including inpatient hospitalizations in both general and specialty hospitals, emergency room and outpatient hospital services, ambulatory and inpatient physician visits, long-term care, and prescription drugs (where applicable). In addition, the cost to other major health entitlement programs, including the veterans' health benefits, the Federal Employees Health Benefits (FEHB) and military health programs, the Indian Health Services, and health services for coal miners were also estimated.

As shown in figure 3, of the \$173 billion medicare is projected to spend in FY 1995, more than 18 percent (or \$31.9 billion) will result from illnesses and other medical problems attributable to substance abuse.

TABLE 2. *Substance abuse costs by Federal health entitlement program.*

Entitlement program	(\$ in billions)		
	Total cost	Substance abuse costs	Substance abuse percent
Medicare	\$173.3	\$31.9	18.4%
Medicaid	96.4	18.2	18.9%
Veterans health	17.7	5.1	28.8%
Other health*	33.5	5.1	15.2%
Total	\$320.9	\$60.3	18.8%

KEY: * = Includes Federal employees health benefits, military health, Indian Health Service, and retired coal miners health benefits.

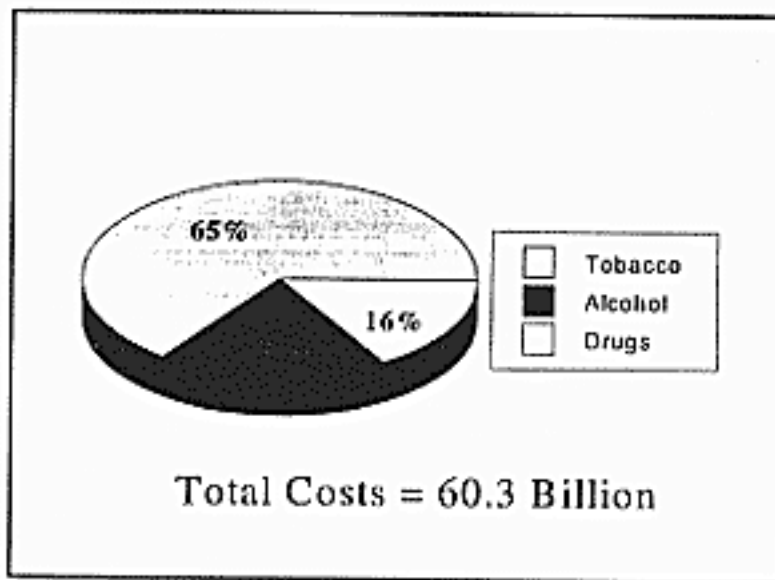


FIGURE 3. *Proportion of substance abuse costs by type of substance: Federal health entitlement programs.*

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estimate includes only the Federal share of medicaid payments. While on average, the State pays about 47 percent of the costs of medicaid, these are not included in the authors' estimates since the focus of this analogy is Federal spending on entitlements. The State share has not been included in these estimates. However, an analysis of State medicaid costs would probably reveal an even higher proportion of substance abuse-related costs because State programs include optional welfare categories that provide cash payments to poor individuals not eligible for AFDC, such as single men whose level of substance abuse is higher than for those covered under the AFDC program. For these recipients no Federal payments were involved.

The total cost of substance abuse to veterans' health programs is \$5.1 billion. This represents nearly 30 percent of the costs for DVA health-related services, a proportion much higher than for other Federal health programs.¹³ Because of the needs of the population it serves, the DVA provides considerably more direct substance abuse treatment services through both inpatient substance abuse and psychiatric units and outpatient substance abuse clinics than do other entitlement programs.

Other major health entitlements include the FEHB program, military health, the Indian Health Service, and health benefits for coal miner retirees. These will account for 7 percent—or \$5.1 billion in FY 1995—of substance abuse-related health entitlement costs. The lower substance abuse-attributable percentage—15.2 percent—in these other health programs compared to medicare and medicaid is due in part to the fact that the FEHB accounts for half of these. The FEHB program purchases private health services for Federal employees and retirees. Since the FEHB beneficiaries tend to be healthier than the medicaid or medicare populations, with a lower use of tobacco, alcohol, and other drugs, their costs attributable to substance abuse are lower. Their costs are based on the percentage of substance abuse-attributable costs calculated by CASA for individuals with private insurance.

As noted earlier, these estimates of substance abuse-related costs must be considered quite conservative. As related to Federal entitlement spending, this is particularly the case for several reasons. First, individuals who become eligible for an entitlement program due specifically to their substance abuse are not accounted for in these estimates. Technically, in these cases, all of their healthcare costs, not only those for treating substance abuse-related illnesses, would be included in substance abuse-related costs. As already seen in table 1, some costs to the SSI and disability program have been factored into this analysis. However, these estimates only include the income assistance portion of DI and SSI, and not the associated medicare and medicaid costs.

Second, except in the case of AIDS and babies born to drug-abusing mothers, the authors' estimates do not include the indirect negative health effects of substance abuse on nonsubstance abusers. Cases in which an individual requires medical care due to the actions of someone else who is under the influence of alcohol or drugs, as in DWI or an occupational accident, are not included in the authors' substance abuse-related costs. Finally, as mentioned previously, another reason that these figures underestimate the cost of substance abuse is that the epidemiologic literature linking alcohol and other drugs to subsequent illness is limited compared to the available work studying the health effects of tobacco. As more research is conducted on the health effects of alcohol and drug use, the substance abuse-related costs are likely to increase.

As shown in figure 3, nearly two-thirds—or \$39.2 billion—of all substance abuse-related health entitlement costs were for treating tobacco-related diseases and illnesses. Alcohol-related conditions accounted for nearly 1 out of 5 of these dollars—\$11.5 billion—and drugs accounted for the remaining 16 percent—\$9.6 billion.

A breakdown of tobacco-, alcohol-, and drug-related costs by program (figure 4) is revealing. The vastly different distribution of substance abuse-related costs by type of substance within the medicare and medicaid populations is due both to the progression of these illnesses and to different drug use behavior in these two populations. Tobacco-related illnesses are much more prevalent in the medicare population, where the long-term effects of smoking are more likely to have taken their toll. For medicare, 80 percent—or \$25.5 billion—of substance abuse costs are attributed to tobacco. For medicaid, tobacco-related illnesses accounted for only 45 percent—or \$8.2 billion—of substance abuse-related costs, with drug-related conditions accounting for nearly another third—\$5.6 billion—and alcohol-related diseases responsible for the remaining quarter—\$4.4 billion. The elderly have a higher rate of smoking than the population under age 65, with almost 56 percent having smoked during their lifetimes. In part, this higher smoking rate may be due to the fact that the hazards of smoking were not fully evident until the 1970s. But more germane is the fact that the elderly have also smoked for longer periods of time, which greatly increases their risk of acquiring

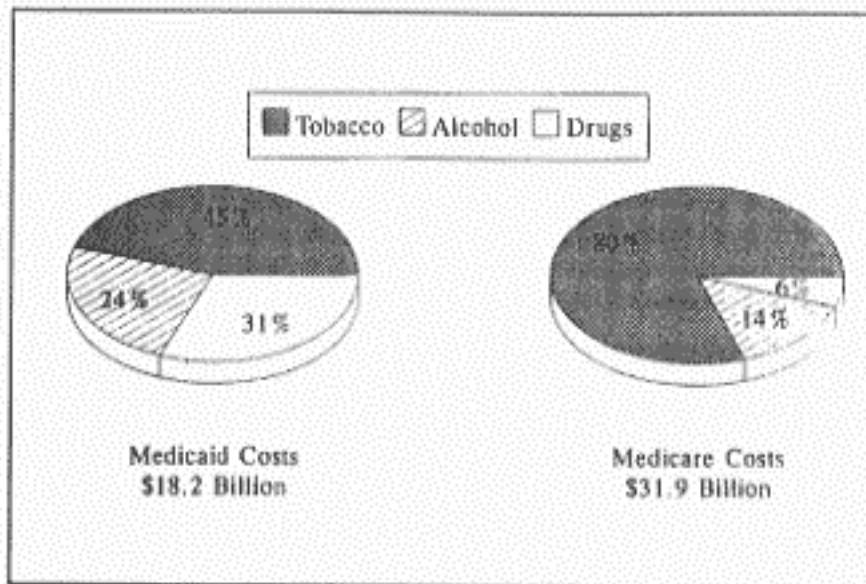


FIGURE 4. *Proportion of substance abuse costs by type of substance: medicare and medicaid.*

smoking-related illnesses. Among the elderly, 58 percent of the current smokers and one-third of former smokers consumed at least a half a pack a day for 35 years or more.

Although the medicaid population also has a higher smoking rate than the general population, medicaid recipients are much younger and therefore less likely to acquire diseases from the long-term effects of smoking until they are older (however, this does not bode well for the future). The significant proportion of drug-related conditions in medicaid are almost entirely due to birth complications resulting from drug use during pregnancy, drug-related trauma, and human immunodeficiency virus (HIV) acquired through intravenous drug use.

While all categories of health providers treat substance abuse-related conditions, for some services these conditions are more prevalent. Table 3 shows the percentage of medicare and medicaid payments to specific health providers that are attributable to substance abuse. Clearly, hospitals bear a large burden of treating substance abuse-related conditions. medicare and medicaid substance abuse-related costs in both general and specialty hospitals (including psychiatric, rehabilitation, and tuberculosis [TB] hospitals) make up more than 20 percent of the total dollars spent under these programs for treatment of conditions

TABLE 3. *Proportion of medicare/medicaid expenditures attributable to substance abuse—by provider.*

Provider	Medicare	Medicaid
Hospital	22.0%	23.8%
Specialty hospital	21.0%	21.0%
Outpatient services	7.8%	9.1%
Emergency rooms	14.9%	16.3%
Ambulatory physician	8.2%	8.9%
Inpatient physician	16.3%	14.4%
Prescription medicine	n/a	9.4%
Nursing homes	20.0%	18.3%
Home health	20.0%	18.3%
Total	18.4%	18.7%

attributable to substance abuse. Many of the conditions associated with substance abuse that were identified in the literature, such as lung cancer and AIDS, require extensive inpatient hospital services. But conditions that otherwise would not require hospitalization are exacerbated by substance abuse, such as is the case with smoking and respiratory infections or drinking and ulcers. In the absence of tobacco or alcohol use, these conditions might not have been as serious and, thus, might have been treatable on an ambulatory basis.

In psychiatric hospitals, which make up the vast majority of specialty hospitals, 15 percent of patients have a primary diagnosis of substance abuse, and approximately 25 percent have a secondary substance abuse diagnosis according to surveys of mental institutions. Thus, substance abuse is involved in nearly two out of every five cases treated in these facilities (National Association of Psychiatric Health Systems 1993).

In contrast to inpatient care, only 8 to 9 percent of outpatient clinic care and ambulatory physician services are spent treating substance abuse-related conditions. Since many individuals go to clinics and physicians' offices for either preventive services (such as physical examinations or pap smears) or for relatively minor problems (such as cold or flu), it is understandable that a lower proportion of these services are associated with substance use or abuse.¹⁴

Emergency room services, especially for trauma, are much more directly associated with substance abuse than other outpatient services. However, the higher substance abuse-attributable percentage that was applied to medicaid emergency room expenditures than to medicare is due to the difference in the percentage of trauma cases

that can be attributed to substance abuse in the elderly and nonelderly populations. While most surveys of trauma units and emergency rooms have revealed that substance abuse is involved in anywhere from 40 to 60 percent of the cases, further research revealed that this proportion only applies to trauma cases for individuals under 65. Nearly two-thirds of trauma in the elderly is related to hip fractures, which have not been linked to substance abuse. However, studies of falls in the elderly have indicated that alcohol consumption is a contributing factor. Smoking may also be indirectly related to hip fractures since it has been linked to osteoporosis, which degenerates bone mass and facilitates bone breakage. Forty percent of trauma in the medicaid and general population was attributed to substance abuse, while in medicare only 14 percent was attributable.

Table 4 breaks out the medicaid substance abuse-related hospital costs for 1991 by the four categories of costs described in the Methodology section. The largest share—71 percent—of these attributable costs is for treatment of diseases and other health conditions for which substance abuse is a major risk factor. Direct treatment of substance abuse disorders, primarily detoxification, accounted for only 19 percent of substance abuse-related costs.

As discussed earlier, in addition to the costs for healthcare entitlements, substance abuse either directly adds to the cost of other government programs or makes it difficult to decrease the size of those efforts. One example of this is SSDI (see figure 5). This pie chart depicts the costs to the Federal DI Fund attributable to substance abuse. Overall, substance abuse accounts for \$5.6 billion of expenditures from the DI Trust Fund. More than 80 percent of these costs were incurred due to disability from tobacco-related disease; only 20 percent of these cases attributable to substance abuse were related to alcohol or drugs.

Applying the same attributable risk factors that were used for calculating health costs, the percentage of the disabled who became eligible by virtue of the abuse of tobacco, alcohol, or drugs was calculated. For the same reasons outlined in the discussion of tables 1 and 2, these must be considered lower-bound estimates. In addition, the Social Security Administration estimates that only 43,000 of the 915,000 DI beneficiaries

TABLE 4. *Substance abuse costs to medicaid: Total hospital care, 1991.*

			% of total
Direct treatment for substance abuse		\$776,305,150	18.7
General hospitals - inpatient	\$538,607,250		
Psychiatric hospitals	\$237,697,900		
Treatment for diseases/conditions totally attributable to substance abuse		\$112,014,143	2.7
Treatment for diseases/conditions where substance abuse is a major risk factor		\$2,932,558,132	70.5
Additional days required for patients with a secondary diagnosis of substance abuse		\$336,461,250	8.1
Substance abuse total		\$4,157,444,995	

SOURCES: National Hospital Discharge Survey 1991; 1992 HCFA Statistics; National Association of Psychiatric Hospitals Annual Survey 1992.

classified with mental disorders were eligible by virtue of having a primary diagnosis of substance abuse. This also appears to be a low estimate because there may be more who were not correctly classified as having a primary diagnosis of substance abuse, and the estimate does not include those who are dually diagnosed with a mental and substance abuse disorder. Thus, it is reasonable to assume that the attributable costs of substance abuse to the DI program are higher. Nevertheless, despite these limitations, substance abuse is still responsible for more than 1 in every 7 dollars spent by the DI program. It should be noted that, subsequent to the preparation of this chapter, Congress passed

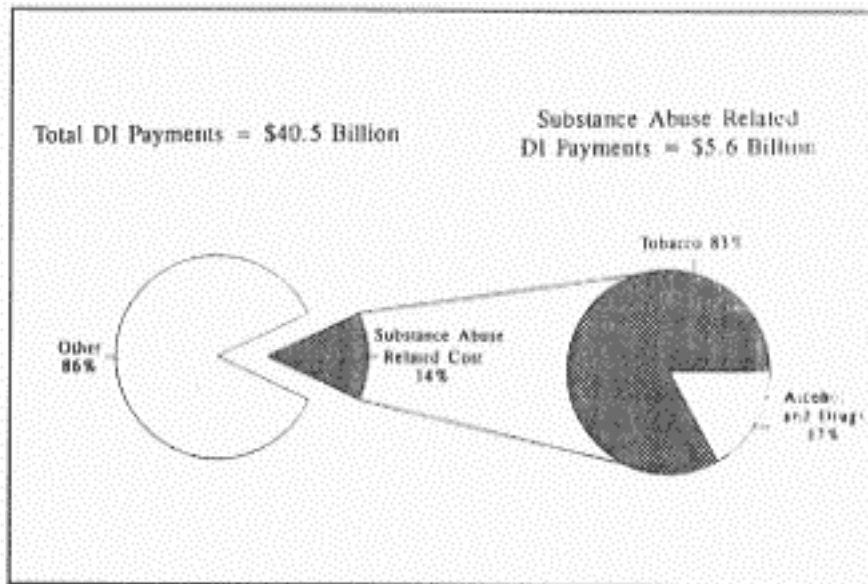


FIGURE 5. Substance abuse-related disability insurance (DI) payments.

legislation eliminating drug and alcohol abuse as a disability for purposes of eligibility in both the SSDI and SSI programs.

As noted earlier, data for the disabled were only available for the DI program (although an additional 90,000 beneficiaries of the SSI disability program are also eligible solely by virtue of a substance abuse-related disability). However, it could be assumed that a significant portion of civil service personnel, veterans, or SSI recipients are also eligible as a result of illnesses attributable to the effects of abusing tobacco, alcohol, or drugs. The costs associated with these individuals are not included in the authors' estimates.

Unlike SSDI, it is not possible to estimate how many recipients of AFDC and food stamps are eligible *because* of substance abuse. Even within SSI, which had an explicit alcohol and drug disability eligibility category, many individuals disabled by chronic illness resulting from substance abuse were not easily identified.¹⁵

However, estimates can be made of the number of recipients who may abuse substances from surveys of regular use of alcohol or illicit drugs. Extrapolating from these prevalence statistics, the public assistance benefit costs for maintaining individuals on welfare who abuse substances can be determined.

Based on data reported in the 1991 National Household Survey on Drug Abuse (NHSDA), tables 5 through 7 indicate the percentage of recipients for each program who reported using alcohol and/or drugs on a regular basis. Of women between the ages of 18 and 44 receiving AFDC, about 1 in 10 report that they have had at least four binge drinking episodes (five or more drinks in one sitting) in the last month; 1 in 8 indicate monthly or more frequent use of an illicit drug; and 1 in 5 report regular use of alcohol, drugs, or both.

TABLE 5. *Substance abuse among AFDC women (ages 18 to 44).*

	% regular users*
Alcohol only	9.9
Other drugs only	12.5
Alcohol and/or other drugs	20.0

KEY: * = Regular use is defined as at least monthly use of drugs or four or more episodes of binge drinking (five or more drinks in one sitting) in the last month.

SOURCE: 1991 National Household Survey on Drug Abuse, U.S. Department of Health and Human Services.

Similar percentages can be observed overall among recipients of food stamps, although male recipients report considerably higher use. Almost 30 percent of men in households receiving food stamps indicate regular use of alcohol, illicit drugs, or both. In general, male recipients appear approximately twice as likely to admit regular use of either or both of these substances than do females.

For the SSI population,¹⁶ an even more pronounced difference exists in regular drug and alcohol use between men and women: 42 percent of the men report regular drug or alcohol use, while only 17 percent of the women indicate such use. More than one-third of the men admit to regular use of illicit drugs.

It should be noted that all of these statistics on regular use must be considered conservative. Since the NHSDA is a government-sponsored survey, many individuals are reluctant to report any substance use and are even less likely to admit to regular use. This is particularly true of individuals receiving some form of public assistance who may believe such an admission could lead to a termination of their benefits, loss of custody of their children, or even criminal prosecution. In addition, since the data are based on a household survey, individuals who are homeless or institutionalized and more likely to be substance abusers are underrepresented.

TABLE 6. *Substance abuse among food stamp recipients (ages 18 to 64).*

	% regular users*		
	Men	Women	Total
Alcohol only	20.5	7.5	11.4
Other drugs only	16.2	9.8	11.7
Alcohol and/or other drugs	29.2	15.3	19.5

KEY: * = Regular use is defined as at least monthly use of drugs or four or more episodes of binge drinking (five or more drinks in one sitting) in the last month.

SOURCE: 1991 National Household Survey on Drug Abuse, U.S. Department of Health and Human Services.

TABLE 7. *Substance abuse among SSI recipients (ages 18 to 44).*

	% regular users*		
	Men	Women	Total
Alcohol only	19.9	4.3	11.1
Other drugs only	34.6	14.0	22.3
Alcohol and/or other drugs	42.4	17.2	28.2

KEY: * = Regular use is defined as at least monthly use of drugs or four or more episodes of binge drinking (five or more drinks in one sitting) in the last month.

SOURCE: 1991 National Household Survey on Drug Abuse, U.S. Department of Health and Human Services

CONCLUSION

The triangle of epidemiologic, economic, and policy research can be a powerful tool in converting technical or scientific information into relevant and persuasive information for public policy. At a time when priorities are focused on how less money can be spent, this kind of research should shed a very different light on the nature of current government spending and how spending might be more realistically reduced through positive rather than negative means. Substance abuse pervades many of those entitlement programs that draw the most attention from budget cutters. As the attempt to balance the budget is made and commitments to constituents continue, it is important to bear in mind the terrible toll that tobacco, alcohol, and drugs are

having on the Federal budget. Research looking at both the causes and the effectiveness of various prevention and treatment efforts becomes critical if the budget and many other problems are to be solved through realistic and long-term solutions that also reflect the caring and generous nature of society.

NOTES

1. A more complete description of this methodology is contained in a number of papers issued by CASA and in a publication in the *American Journal of Public Health*. The CASA papers (and article reprints) are available through the Center on Addiction and Substance Abuse, 152 West 57th Street, New York, NY 10019.
2. These PARs are based on the best available epidemiologic research investigating the relationship between substance abuse and morbidity. For some diseases and conditions, there was clear evidence that a relationship exists between substance abuse and the occurrence of the condition, but prospective or case control studies that calculate PARs had not been conducted. In these cases, the authors employed measures other than PARs, including estimates from large surveys and from medical experts. For example, in the case of AIDS, 1992 Centers for Disease Control and Prevention (CDC) surveillance data were used to estimate the percentage of these cases that were caused by intravenous drug use (IVDU). These surveillance data do not establish causality; they merely categorize new cases by the risk groups they fall into. In 1992, 55 percent of new pediatric AIDS cases and 33 percent of adult cases fell into the IVDU risk group. The authors applied these percentages to total reported medicaid AIDS days to estimate those that were substance abuse related.
3. A similar problem exists for other diseases such as lung cancer where, after the initial diagnosis, future hospitalizations would be for other problems or procedures such as related respiratory distress or chemotherapy. However, disentangling the overlap between alternative causes for these other diagnoses and those attributable to the lung cancer made it difficult to count those days in the authors' estimates. Thus, there is reason to believe that these estimates are low since this problem would exist for a number of diagnoses.
4. With respect to this fourth category, the authors' analysis understates the impact of substance abuse comorbidity due to limitations of medical reporting.

5. The association between illicit drug use and resulting illness has not been as thoroughly studied as those of smoking and alcohol because drug use is less prevalent in the general population and more difficult to identify; subjects are reluctant to admit openly to illegal conduct. Alcohol studies are also somewhat limited, due in part to the greater difficulty in establishing level of use (self-reporting of alcohol use is less reliable than that of tobacco because heavy use of alcohol has a negative social stigma). Even for cigarette smoking, a great deal of research is available on illnesses highly prevalent in the population such as lung cancer and heart disease, but less is available for less prevalent diseases, such as Crohn's disease. Thus, the authors' study includes only those diseases and conditions that have been clearly documented as related to substance abuse. The authors attempted to use the best research available, recognizing that the field of epidemiology is constantly evolving and sharpening its findings. Further inquiry into other related conditions would most likely significantly increase substance abuse-related medicaid hospitalization costs.
6. A study at Johns Hopkins Hospital revealed that 28 percent of 435 ICU admissions and 39 percent of ICU costs were substance abuse related (Baldwin et al. 1993).
7. Using this definition, entitlement programs include: Social Security and other Federal retirement programs; DI and disability compensation for Federal employees, veterans, and coal miners; SSI for the poor and aged disabled and income assistance through AFDC and food stamps; health benefits through medicare, medicaid, the Veterans Administration, Federal Employees Health Benefits, military health services, the Indian Health Service, and coal miner retirees health benefits; and unemployment compensation.
8. Civil service retirement also includes some disability costs, but the authors were unable to separate these out.
9. Including the National Hospital Discharge Survey, the National Medical Expenditure Survey, the National Nursing Home Survey, and a 1-percent sample of DI beneficiaries.
10. These numbers are the most recent reported by the Office of the Inspector General as of June 1994 (U.S. General Accounting Office 1994). An earlier report released by GAO estimated 249,199 SSI and DI beneficiaries had a primary or secondary diagnosis of substance abuse. They estimate for SSI alone that 90,687 beneficiaries were addicts.

11. According to the 1991 National Household Survey on Drug Abuse. Regular use is defined as monthly or more frequent use of an illicit drug and four or more episodes of binge drinking (five or more drinks in one sitting) in the last month.
12. For more information on the welfare programs, read CASA's reports on *Substance Abuse and Women on Welfare* and *Substance Abuse and Federal Entitlement Programs*.
13. These costs are estimated from a report by the Department of Veterans Affairs (1994) on substance abuse in VA facilities. That report estimated an even higher percentage of substance abuse-related costs because it included all medical services used by individuals with either a primary or secondary diagnosis of alcohol or drug abuse. The authors' estimate includes only services directly attributable to substance abuse, not all services provided to substance abusers.
14. Note, however, that the same argument used above regarding hospitalization can also be made for visits to doctors' offices. Minor conditions, such as colds or minor bronchial infections, are exacerbated by smoking. Smokers may thus be more likely to seek a doctor's intervention; these costs have not been factored into the authors' analysis because there is insufficient research in this area to make an estimate.
15. The SSI program is separate from SSDI.
16. These percentages refer to all those SSI recipients who are disabled and blind. The numbers do not include SSI recipients over the age of 65.

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