



## **International Guidelines for Estimating the Costs of Substance Abuse**

### **Summary of 2001 Edition**

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#### **Introduction**

There is a strong interest in many countries regarding the development of scientifically valid, credible estimates of the economic costs of drugs and alcohol. The costs of alcohol and drugs represent an issue of key interest to stakeholders, policy makers and the media. Knowledge of the costs of resources associated with alcohol and drug abuse informs decisions related to funding and to interventions designed to reduce abuse. Relatively few countries have attempted to estimate the costs of substance abuse. Such estimates are fraught with methodological difficulties resulting in widely varying estimates.

Three international symposia have been held to discuss the issues involved in estimating the social and economic costs of substance abuse, and to seek a consensus on the most appropriate model. The first Symposium, held in Banff in 1994, was to explore the feasibility of establishing an internationally acceptable common methodology for estimating the costs of alcohol and other drugs. The Symposium brought together persons with experience and expertise in dealing with the issues of costs estimation and resulted in the first set of guidelines, which were published by the Canadian Centre on Substance Abuse.

In 1995, a second Symposium was held in Montebello, Quebec. Whereas the first meeting had focused on modelling and methodological issues, this Symposium focused more on epidemiological and practical issues involved in deriving cost estimates. In 2000, a third symposium was held in Banff, Alberta. The focus was on the results of cost studies using the Guidelines, as well as special considerations involved in conducting cost studies in developing economies and in drug-producing countries. These meetings led to revised Guidelines.

## **Why it is important to estimate the costs of substance abuse accurately**

Estimates of the social and economic costs of substance abuse serve many purposes. First, economic cost estimates are frequently used to argue that policies on alcohol, tobacco and other drugs should be given a high priority on the public policy agenda. The public is entitled to a quality standard against which individual cost estimation studies can be assessed. Without such a standard, there will be a tendency by the advocates for each social problem to overbid, adding in additional items to make their concern a suitably high (even exaggerated) number.

Second, cost estimates help to appropriately target specific problems and policies. It is important to know which psychoactive substances involve the greatest economic costs. The specific types of cost may also draw our attention to specific areas that need public attention, or where specific measures may be effective.

Third, economic cost studies help to identify information gaps, research needs and desirable refinements to national statistical reporting systems. Indeed, the Guidelines argue that the development of improved, internationally comparable methods for estimating the costs of substance abuse should be attempted, insofar as possible, within the framework of the existing System of National Accounts (SNA). This system is best known for the Gross Domestic Product (GDP) measure of total market activity. The development of estimates of the costs of substance abuse within this framework would be a further step in the improvement and refinement of national accounting systems, increasing their relevance and usefulness.

Last but not least, the development of improved estimates of the costs of substance abuse offers the potential to provide baseline measures to determine the efficacy of drug policies and programs intended to reduce the damaging consequences of alcohol, tobacco and other drug use. Estimates of the social costs can assist policy makers in evaluating outcomes, as expressed in terms of changes in social costs in constant-dollar terms. Estimates of social costs can also facilitate cross-national comparisons of the consequences of substance abuse and various approaches to confronting those consequences. Ultimately, cost estimates could be used to construct social-cost functions for optimal tax policy and national target setting.

Perhaps most promising is the prospect for extending cost estimates to more comprehensive cost-effectiveness and cost-benefit analyses of specific drug policies and programs. Without a national (and preferably international) standard, individual analyses are of limited utility, because the results are not comparable, and their conclusions can become dependent upon idiosyncratic assumptions.

## **Theoretical issues in cost estimation**

The 2001 Edition of the International Guidelines should be viewed as a “living” document, subject to further revision and refinement as greater experience is gained and databases improve.

A framework for the development of cost estimates is presented. The major principle underlying the decision regarding which costs to include is the robustness of the estimates, which is in turn dependent on the availability of data. The matrix of factors to consider is generally limited to *costs*. It is recommended that data on revenue *benefits* be collected for inclusion in the calculation of (government) budgetary impact.

Conceptual and methodological issues in the application of this framework are addressed in detail. The purpose is not to advocate a particular approach, but to describe alternatives and discuss the advantages and disadvantages of each approach for particular purposes.

The following issues are discussed:

- definition and measurement of abuse,
- definition of costs,
- treatment and measurement of addictive consumption,
- the demographic and human capital approaches to cost estimation,
- choice of appropriate discount rates
- treatment of private costs and benefits,
- treatment and measurement of intangibles, including willingness-to-pay methods,
- comparing and presenting estimates of the value of human life,
- the positive economic impact of consumption,
- estimates of avoidable costs,
- prevalence vs. incidence-based approaches,
- crime and substance abuse,
- who bears the social costs of substance abuse,
- the budgetary impact of substance use and drug policies,
- special considerations in drug-producing countries.

### **Matrix of costs and issues of measurement**

#### *Which substances to study*

The first issue in designing a framework of what to include in estimating the economic costs of substance abuse is the issue of which psychoactive substances should be covered in the study. Studies may reasonably focus on a single substance or on many substances. However, the determination of scope has definite implications in terms of the level of effort, the data requirements, and the analytic requirements. In practice, analysts have generally performed studies of the cost of abuse of, and dependence on:

- alcoholic beverages,
- tobacco products,
- illicit drugs (other psychoactive substances) as a group; or
- a combination of two or more of these substances, such as alcohol and other psychoactive substances (but not tobacco), or alcohol, tobacco and other psychoactive substances.

Licit drugs such as prescribed and over-the-counter medications, and volatile substances are classes of psychoactive substances of epidemiological significance in many societies that have not been studied from an economic perspective. Although the Guidelines do not specifically address problems associated with misuse of licit drugs, they nevertheless present a valid and salient dimension of the substance abuse problem appropriate for analysis.

#### *Major costs included in cost estimation studies*

The use of psychoactive substances involves a numerous and varied set of adverse consequences. There are four major types of costs that have been analyzed in cost estimates to date:

- (1) health care costs
  - treatment for substance abuse and dependence;
  - treatment for chronic and acute conditions attributable to substance abuse;
  - treatment for co-morbidity and trauma;
- (2) productivity costs
  - premature mortality;
  - morbidity – lost employment or on-the-job productivity;
  - non-workforce mortality and morbidity;
- (3) law enforcement and the criminal justice costs
  - criminal justice expenditures (law enforcement, courts and corrections);
  - crime victim’s time losses;
  - incarceration (incarcerated individuals’ productivity losses);
  - crime career costs;
- (4) other costs such as property destruction from alcohol- or drug-attributable accidents or crime
  - research, education and law enforcement costs;
  - prevention and other public health efforts;
  - property losses or losses due to crime and accidents;
  - welfare costs.

Some of these costs have been omitted from certain studies due to data limitations – rather than because of disagreements about the theoretical correctness of including such costs. Costs may be tangible or intangible and the costs may be incurred by the individual user, other individuals, government or private industry. Intangible costs and the private costs to individual users are generally not included in cost estimation studies.

### **Data requirements**

The International Guidelines present a methodology that all nations may use to prepare estimates of the social costs of substance abuse. The application of the methodology, however, requires extensive data and information that many countries may not possess.

There is strong interest in many nations, including developing nations, in understanding the nature, extent and consequences of the drug problem in all of its manifestations. For example, the 34 nations of the Western Hemisphere of the Americas have agreed to develop estimates of the social costs of substance abuse as part of the Organization of American States Multilateral Evaluation Mechanism (MEM). International organizations such as the WHO, UNDCP, and the EMCDDA are also participating in efforts to develop such estimates. While the methodological approach provides a consistent framework for all nations to use, its application will be subject to tremendous variation due to cross-national data differences. Further confounding the successful application of the methodology is the fact that developing economies may have more difficulty using the methodology because of problems with their data infrastructure.

The first question that any nation must address once it decides to estimate the social costs of substance abuse is whether data are available in sufficient quantity to apply the methodology to produce robust estimates of the major categories of costs associated with drug abuse. A tentative list of the data required to carry out a cost estimation study is as follows:

- Data on population structure by age and gender, and life expectancy by age and gender.
- Data required to estimate morbidity and mortality: prevalence data on drug use and injection drug use; number of deaths and hospitalizations, ideally by cause, age and gender; list of conditions which epidemiological research have shown to be attributable to drug use and the associated relative risks; estimates of the attributable fractions for certain causes of death and disease, based on local information, e.g., motor vehicle accidents, assaults, homicide, suicide.
- Health care costs: hospitalization costs, physician fees, costs of other professional services, and number of cases seen by physicians and other professional service providers by age and gender; ambulance costs (total costs, total number of trips, number of trips for drug-related causes); costs of pharmaceuticals used to treat drug-related conditions (total number of prescriptions, number of prescriptions by cause).
- Policy costs: police, court and corrections costs; expenditures on prevention and research related to drugs; costs of training for physicians, nurses other health professionals, law enforcement.
- EAP costs and estimates of proportion attributable to drugs.
- Indirect productivity costs: mean income by age and gender (to estimate morbidity costs) and present value of lifetime earnings by age and gender (to estimate costs of premature mortality).

The key issues for each of these data domains are whether data are available, in what form and from what source. Hopefully, some of these data will be collected from national censuses, surveys, or special population studies. In some cases, the information may not be available from formal surveys, but may be available in administrative records. Making estimates of such costs depends on gaining access to these data. The analytic challenge is to obtain data that will provide a plausible basis for attributing some proportion of the costs associated with the particular negative consequence to drug abuse.

In an ideal world, the data required to apply the methodology for estimating the social costs of substance abuse would be available to every nation. Most of this information would normally be required in the ongoing development and refinement of national anti-drug strategies. In reality, however, few nations possess such a wealth of data, and that means that short-term solutions will be required. One approach gaining popularity is the use of rapid assessment tools being developed by the WHO and other international agencies to gather data in particular topical areas. Another approach is to conduct special evaluations to provide plausible estimates of a component of the calculation of social costs. This is particularly useful for estimating the proportion of the costs associated with the particular negative consequence that is attributable to drug abuse (the attribution factor).

For some categories of social costs, a nation may be unable to obtain any information from internal sources. Rather than ignore the calculation of a sub-estimate, they may seek information for sub-estimates from external sources, defined here as representing information from other nations with similar situations or problems. External information may provide reasonable estimates of categories of costs while a longer-term data strategy is implemented. For example, until internal studies are available, it may be better to use the proportion of crime attributable to substance abuse in another (similar) country rather than ignore a potentially important cost element.

## Economic evaluation of policies and programs

Evaluation of policies and programs designed to reduce substance abuse is essential to inform public policy. Equally important is economic evaluation, to ensure that resources are used appropriately. The estimation of the economic and social costs of substance abuse provides tools for economic evaluation of policies and programs.

Aggregate estimates of the social costs of substance abuse are *not* designed to indicate the benefits that would be realized by effective prevention and harm reduction programs since

- some of these costs relate to past substance abuse (for example, smoking-attributable morbidity), and are, therefore, unavoidable costs; and
- it would be unrealistic to expect the complete elimination of the abuse of any particular substance; even for periods well into the future, when the effects of past abuse have washed out of the system, it may be possible to reduce the costs of substance abuse, but certainly not to eliminate them completely.

Thus, it is necessary to estimate the avoidable costs of substance abuse in order to be able to indicate the extent of potential returns resulting from interventions. However, estimates of avoidable costs fail to indicate how these cost reductions might be achieved or whether the social benefits resulting from these programs would exceed their social costs. These issues can be only settled by project appraisal.

Project appraisal evaluates the efficiency of alternative projects or alternative policies. Its aims are to determine, by a process of enumeration of the benefits and costs of alternative projects or policies, the appropriate level of public resources to be devoted to the problem and the solutions to which those resources should be devoted. Its objective is to maximize the social rate of return resulting from the use of public resources so that these resources can be used as efficiently as possible.

In many cases the objectives of public expenditure analysis may be even more modest. The objective of the evaluation exercise may be predetermined (for example, a reduction of 10 per cent in juvenile smoking prevalence) so that the analysis is reduced to cost comparisons of alternative programs designed to achieve the same objective. In other situations, it may be impossible to conduct a benefit-cost analysis (BCA) due to difficulties in evaluating a program's output. In these circumstances, cost-effectiveness analysis (CEA) is appropriate.

CEA can be defined as a detailed comparison of the costs of alternative techniques for achieving the same predetermined objective. In practice, CEA can be used to determine how a given objective can be achieved at least cost or how a desired output can be maximized for a given cost. The advantage of CEA in its usual, more limited sense is that there is no need to place a value on output benefits. This makes the analysis much simpler than BCA since it is necessary to identify only the costs of alternative interventions. This is generally a much more straightforward process than valuation of program benefits, even though significant problems may arise in the allocation of overhead costs. The major disadvantage of CEA is that the policy objective is predetermined rather than arising from the analysis. CEA in itself is of no assistance in determining policy objectives. As Murray *et al.* point out, "The implicit assumption (of CEA) that the required additional resources would need to be transferred from another health intervention or from another sector is rarely discussed".

## Conclusions

A general framework has been proposed for the development of cost estimates. It has been argued that economic cost studies should be conducted within the framework of cost-of-illness studies. The impact of substance abuse on the material welfare of a society is estimated by examining the social costs of treatment, prevention, research, law enforcement and lost productivity, plus some measure of the quality-of-life years lost. It is recognized that data are frequently lacking for many of these costs. However, in many countries it will be possible to develop reasonable estimates for some, if not most, of the costs associated with substance abuse. Thus, these Guidelines should be viewed as a framework rather than a rigorous methodology to be applied in every situation.

An intriguing possibility is the development of special “satellite accounts” in the System of National Accounts (SNA) to estimate the costs of substance abuse. In 1993, those concerned with defining the SNA framework issued a new manual, which included the concept of satellite accounts. Their initial concern is to better represent the physical environment in the SNA, but they will also be used for characterizing the behaviour of non-market activities, such as housework. It would also seem a sensible development in cost-of-illness (COI) studies in general, and those involving substance abuse in particular, to develop them in a satellite SNA account framework, as far as that is possible. The extension to satellite accounts would almost certainly speed up the development of measurement and tabulation of non-market activities, but at present it remains underdeveloped. Those who wish to conduct cost-of-illness studies within a SNA framework, and incorporate the impact on the non-market sector, will find themselves in the forefront of this development.

The Guidelines are only one step in a long-term process aimed at developing more reliable and credible estimates of the costs of substance abuse. The next step in this process will be to apply the recommended procedures in new studies, and this in turn should lead to further refinements to the Guidelines. The long-term goal is to move from cost estimation to cost effectiveness analyses, and eventually to cost-benefit analyses of substance abuse policies and programs. In the meantime, the development of improved economic cost estimates will help to give substance abuse issues their appropriate priority on policy agendas, provide useful information for targeting interventions, and help to identify information gaps.