The concepts of ”cost to society” and “social cost”

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Introduction

I am going to talk about the concepts of cost to society and social cost, but let me first of all explain the background for this paper. I am a PhD student in economics at the University of Oslo and a research fellow at the National Institute for Alcohol and Drug Research in Norway where I participate in a project that tries to examine the costs and benefits of different programs for treating drug users (cost-benefit analysis). To get an idea of what kinds of benefits treatment might have, I decided to examine several studies dealing with the cost of drugs and alcohol to society.[1] The idea was that whatever was listed as a cost in those studies could potentially be a benefit if treatment eliminated or reduced the costs.

As it turned out, I did not find the literature very helpful. Initially the problem was lack of agreement among the different studies on the elements that should be labelled cost to society. I then spent some time trying to solve this problem by doing more research on the concept of cost and thereby generating a list of elements that should be included (or excluded). Although this led to the discovery of some serious problems with the concept as it was employed in many studies, it also left me frustrated. It turned out that the problem ultimately had no solution in the sense that it was impossible to find a neutral or scientifically valid conclusion about the cost to society. One of the many reasons why there is no neutral answer is that the analysis depends strongly on whether you believe taking drugs is a voluntary act or a disease. More generally it depends on difficult (and unsolvable?) philosophical questions about the nature of voluntary choice and legitimate preferences. The answer to these questions, in turn, leads the researcher to include different cost categories.

In the following presentation I will try to take you through the three stages described above. It is important to note that the paper is limited to conceptual problems. There are of course many empirical problems in the estimation of costs to society, but I shall leave these out of this

[1] For an overview of different cost studies, see Robson, Lynda and Eric Single (1995) *Literature Review Of Studies On The Economic Costs Of Substance Abuse, A Report of The Canadian Centre On Substance Abuse*, http://www.ccsa.ca/costslit.htm. See also Cartwright (1999) for an overview of the literature on economics and drugs. Collins and Lapsley (1991) also present a detailed overview of many studies dealing with alcohol, drugs and smoking. For more focused discussion on the conceptual problems, see Harwood (1998);*The International Guidelines* – Singe et al (1996); and French et al (1991). See also Xie et al (1999) for a short introduction to the various approaches and a discussion of many of the conceptual issue I have left out (incidence vs. prevalence approach; human capital vs. willingness to pay method; and discount rates). Finally, the interested reader should consult the commentaries on Harwood’s calculations in *Addiction* 1999, vol 94, issue 5, pp. 631-647.

discussion.[2] (Here is an example of a difficult empirical question: To what extent should the cost of different crimes be attributed to drugs or alcohol?). Moreover, I shall not discuss all possible conceptual problems. For instance, I shall mainly ignore the many problems that arise when we try to combine the effects on many people into an aggregate measure of costs or benefits – i.e. the issue of interpersonal comparison. Finally, my main interest is estimates of the cost of drug use. Hence, many of my examples are from this area rather than cost of alcohol. The conceptual problems are, however, very similar for both alcohol and drugs.

Stage I: Different studies – different cost categories

In this section I want to give some examples of cost-studies and how they differ. The aim is mainly descriptive. In other words, I want to pout out a few areas of disagreement and the issues involved without necessarily taking a position on who is right or wrong.

At a general level the cost categories of many studies in this field can be presented under four headings: 1. Lost earnings; 2. Crime/Law enforcement; 3. Health (Treatment – direct and indirect, prevention, research); and 4. Other effects (accidents, administration). There is, however, considerable and significant disagreement both on these general categories and on which costs should be included under the general headings. Rather than provide an exhaustive overview of this, I want to focus on four areas of disagreement.

Consider first Harwood's (1999) estimate of the costs of alcohol and drug abuse in the US in 1992 (see appendix 1). According to him "In 1992 the economic cost to society from alcohol and drug abuse was an estimated $246 billion" (Harwood 1999, p. 631). The largest cost category in the study is "Lost Earnings" which represents 72% of all costs. Clearly, if one disagrees with the inclusion of this category, the cost estimate will change significantly. For instance, Healey et al (1998) argue that lost earnings should not be included in the estimate of social cost.

The study by Healey et al can also be used to illustrate a second point of disagreement. It was based on a sample of 1075 drug users and the conclusion was that each user cost society about $17 000. Crime represented 78% of these costs and the rest was mainly health care costs. One of the reasons crimes turned out to be so costly in that study was that Healey et al – unlike

[2] See Heien and Pittman (1989) for a detailed discussion of some of the empirical problems related to estimating the cost of alcohol abuse.

Harwood - included the value of the goods stolen as a cost of crime (61% of the total costs). Hence, whether we should include the value of stolen goods represents a second point of disagreement.

A third example of a contested cost-category is the money spent on drugs and alcohol. In the context of drugs, Collins and Lapsley (1991) include these outlays in the cost estimate since (in the words of Robson and Single, 1995) "the consumer does not receive a benefit equal to the cost of the product." This is no small issue since the cost of drugs represented more than one third of the total costs in the mentioned study. (Specifically: 507.8/1441.1 = 35.2; Collins and Lapsley, 1991, p. 86-87). Many other studies – for instance Single (1998) does not include this cost.

As a final example of categories that cause disagreement, consider Kleinman's (1999) suggestion that we should include human suffering as a cost category. The argument against doing so is usually that it is impossible to measure human suffering in dollars. Kleinman is clearly aware of this but he seems to believe that it is at least possible to derive some kind of lower bound on the cost of human suffering. Assume that suffering can be measured by willingness to pay (to avoid the suffering) and that every addict is willing to pay $10 000 every year to stop the habit or that he/she has ten people (friends/family) who are willing to pay $1000 each. Assume, moreover, that there are about 10% addicts in the population. Then "human suffering" amounts to about $200 billion i.e. an increase of 81% on Harwood's estimate. (If included it would represent 45% of the cost estimate). Hence, leaving out or including human suffering produces large changes in the cost estimate.[3]

In short, different studies and different authors use very different cost categories when estimating costs and these differences produce very different estimates (see Table 1). Given this confusion one might ask: Who is right and who is wrong? This question leads me to the second stage of my presentation.

TABLE 1: SOME CONTROVERSIAL COST CATEGORIES

Cost category	**Importance ***	**Yes**	**No** (implicit and/or explicit)
Lost earnings	72%	Harwood (1999)	Henley et al (1998)
Value of stolen goods	61%	Henley et al (1998)	Single (1998)
Cost of drugs itself	35%	Collins and Lapsley (1991)	Harwood (1999)
Human suffering	45%	Kleinman (1999)	Single? (1996)

* Change in estimate if category is excluded.

Stage II: The "correct" cost concept?

In this section I shall argue that a closer look at the concept of cost itself can reduce some of the confusion. I shall also argue that all of the studies are flawed by one major mistake. More precisely none of the studies use a realistic alternative when they compare a "world with drugs" to a "world of no drugs."

In everyday language cost usually means (monetary) outlays.[4] The problem with this interpretation can be illustrated with the following example. A firm wants government subsidies. There are at least two general ways of achieving this. First, they could demand a direct subsidy. Second they could demand a tax reduction. If we by costs simply mean monetary outlays, only the first alternative (the subsidy) has a cost, while the second (tax reductions) requires no direct payment of money to the firm (no "cost" for the government). This demonstrates the weaknesses of the commonsense conception. Both measures - the subsidy and the tax reduction - are essentially the same from the point of view of the government and the firm: The end result is more money to the firm and less money to the government. Hence, both measures should come out as having a cost. and we need a more sophisticated concept of cost than monetary outlays to capture its "true" meaning.

One obvious answer is to use the concept of opportunity costs. That is, the cost of policy *B* is the (expected) value of the (best) alternative we have to sacrifice in order to do *B*. In the example above, both measures imply that the government has to cut something else – either because its income is reduced (reduction in tax income) or because its expenses are increased (subsidy). The value of the "something else" that has to be reduced to give the firm a subsidy

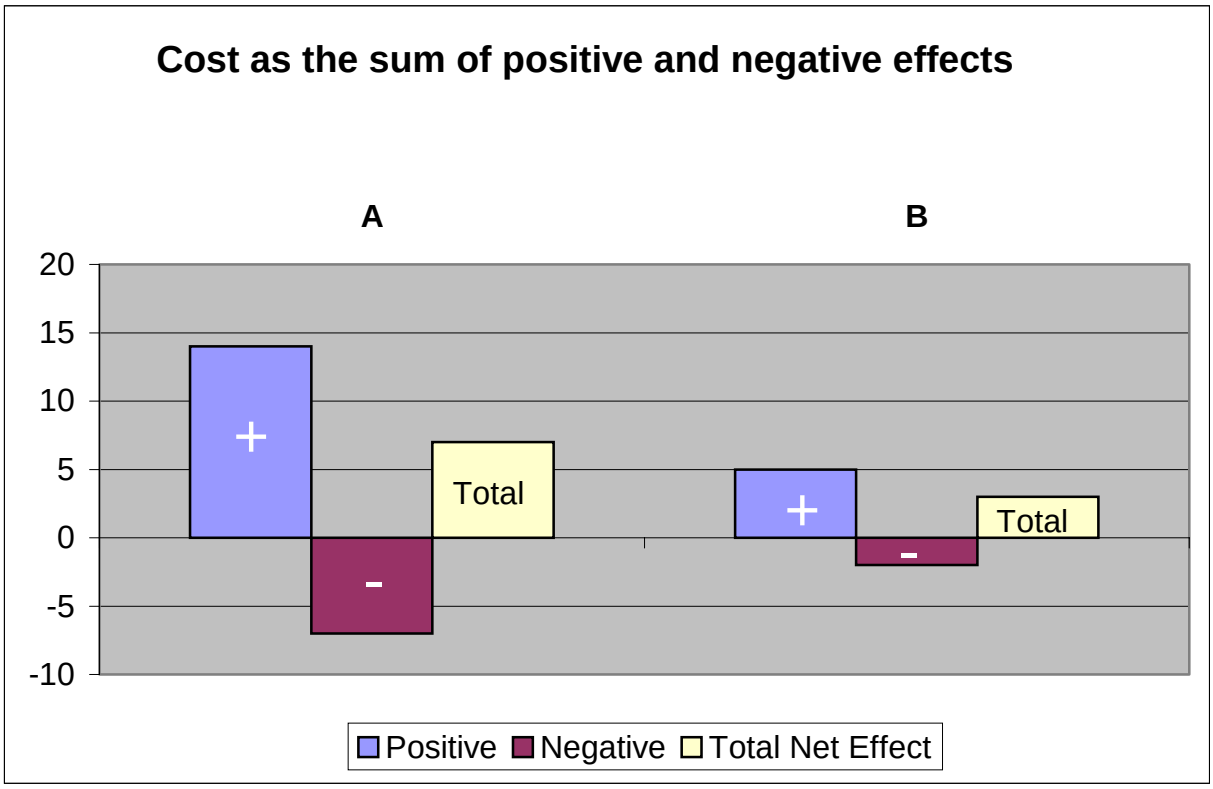
[4] Buchanan (1969) is my primary source on the different concepts of costs in economics. The arguments in this section are inspired by him, but they do not coincide exactly with his views.

or a tax-cut is the cost of both measures. This shows that the opportunity concept of cost avoids the problem of counting only direct monetary outlays.

The solution, however, creates new problems. The concept of opportunity costs often involves a comparison between hypothetical alternatives. We do not know exactly what we have to sacrifice in order to do *B*. Technically speaking we have to compare a measure (*B*) against a hypothetical counterfactual: What would have happened if not *B*? To answer this we need a theory or a model to work out all the expected consequences of a policy-choice. These consequences must also be measured in some kind of (interpersonally comparable) unit (Money? Resources? Utility?). Hence, to find the (opportunity) cost we must use a theory that enables us to work out the expected net sum of positive and negative consequences measured in some kind of unit. Only then can we work out what we sacrifice by not choosing *B*.

Does the concept of cost used in cost-of-illness studies conform to this ideal? Although they often pay lip service to the idea of opportunity cost, I would argue that they fail to use the correct alternative for comparison. The basic structure of most studies of the social costs of alcohol is to measure the monetary value of a situation with drugs to a world without drugs. To estimate how a world of "no drugs" or "no alcohol" would look like they use the current world as a starting point. They then add the income we could have had if there was no addiction since we then (they argue) would have less crime, fewer people in prison, more people working and reduced health expenses. Many (but not all) only add those variables which will make the total income in the imagined world higher although this is clearly wrong since the concept of cost – as explained above – requires comparison of the *total* sum of positive and negative changes (see Figure 1).

FIGURE 1: COST AS THE SUM OF POSITIVE AND NEGATIVE EFFECTS



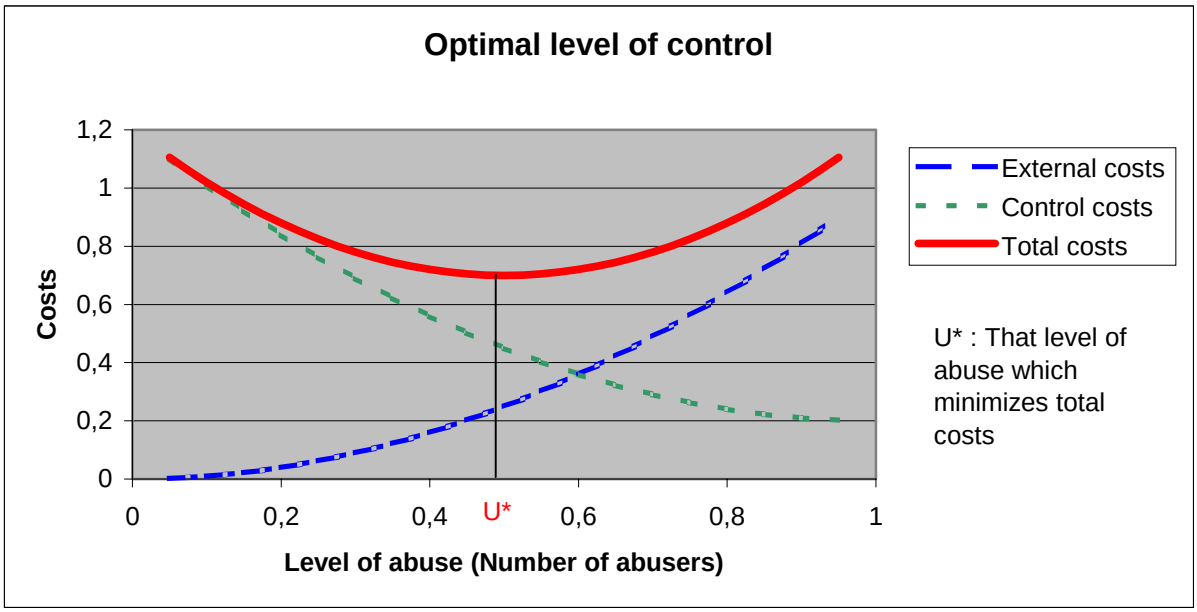
Note: Each policy alternative (A and B) has some negative and positive consequences. The cost of choosing one alternative is represented by the height of the "total" of the other alternative, not the size of "negative effects." In this example, project A is clearly more costly, but is still the one we would choose because the cost is more than balanced by the positive effects. The cost of choosing A would then be the height of "total" in B.

More fundamentally, the concept of cost demands that we compare between *realistic* alternatives. To formalize the problem slightly consider the illustration in Figure 2. The horizontal axis measures the number of users of a substance. The government can try to reduce the number of users and this will reduce the *external cost* as a result of abuse (crime and health costs), but it requires higher *control costs* (police, prison, treatment). When we try to estimate cost (what we expect to sacrifice) we should – be definition – compare realistic and possible worlds. Cost of illness studies assume a world of no users (U = 0 in the figure) AND elimination of all control costs (zero control costs at U = 0). This is clearly unrealistic. To achieve U = 0 we are required to spend resources on control efforts and if we do not include these costs the resulting gap between a "world with drugs" and a "world without drugs" cannot be labelled cost of abuse as we have defined cost.

None of the studies I encountered distinguish between control costs and external costs, but there is strong indication that the control costs are substantial. My own back of the envelope

calculations from Norway may give some indication of this. If we concentrate on the cost of treatment and the cost of enforcing the current legal system (police, prisons and so on), the annual expenditure in Norway is (very roughly) about $188,256,879 (USD).[5] This is not a very large sum if divided by the number of taxpayers ($57 per taxpayer), but if we divide it by the most recent estimate of the number of addicts in Norway (about 10 000), it represents $18 825 in "control costs" for every addict.[6] These calculations are only intended to show that the "control costs" are significant and they cannot be assumed away in an alternative world. In fact are likely to rise if we try to create a world of almost no drugs.

FIGURE 2: Control costs, external costs and the optimal level of control



Note: If we use the common framework, then the optimal level is always zero use, but when we include control costs outlays (as we should according to the definition of cost) we find that the optimal level of use is not zero, but U* (if the aim is to minimize cost).

[5] The calculations are as follows: Based on the yearly accounts from about ten treatment units, I find a rough estimate of how much it costs to have one person in a treatment program for one year (500 000 NOK). I then multiply this by the number of treatment places available in Norway (somewhere around 1000). I then add a proportion of the expenditures used to enforce the legal system (annual cost in 1998: 7 800 000 NOK). I used the proportion of offenders in prisons who were jailed for violating the Norwegian drug laws as an estimate how much of the total costs that should be allocated to drugs. There were some other adjustments, but this was the basic structure of the calculations. (The calculations are available in a separate paper in Norwegian).

[6] Care should be taken when interpreting these numbers. For instance, it does not make sense to say that each drug user cost $18 825 in control costs and that this shows how much society must pay to reduce the number of drug users by one. Presumably the control cost has an effect on some people who otherwise might use drugs and we do not know how many people there are in this group.

I have so far examined the concept of cost as employed by economists and compared this to the cost concept used in cost of illness studies. So far I have said little about the second part of the title i.e. what the phrase "*to society*" imply for which cost categories we should include in our estimation of costs (to society). Once again it can be interpreted in at least two different ways. First one could say that "cost to society" imply that we should include all the individuals in the society in our study. If we do this the theft of a car does not represent a direct cost. As long as we include everybody the fact that a different person now controls the car is only a transfer, not a loss. On the other hand if we interpret "cost to society" as the cost that non-users of drugs and alcohol suffers as a result of other's use of drugs/alcohol (external cost). The contrast to "social cost" is then "private costs" – for instance lost income is a sacrifice that the drug user himself has to suffer (not society). Hence, the value of a stolen car is a social cost (here: an externality), but lost earnings is a private cost.[7]

At this point in my research I believed that I had reduced some of the confusion. First of all the different cost estimates were (more) consistent once I realized that they were measuring different costs (based on different interpretations of social). There is nothing wrong with that. It is perfectly possible to make one cost estimate in which one tries to measure the cost of drug use in general and another in which one tries to measure the cost of drugs to one sub-group of the population (here: those who do not use drugs). In terms of the previous list, the discussion so far might lead to the conclusions indicated in Table2.

TABLE 2 : ELEMENTS TO INCLUDE IN A COST ESTIMATE

Cost category	**Two interpretations**	
	Cost to society (Everybody included)	*External cost (Cost to non-users)*
Lost earnings	Yes	No
Value of stolen goods	No	Yes
Cost of drugs itself	Yes	No
Human suffering	Yes	Yes
Cost of legal enforcement	?	?
Treatment costs	?	?

[7] The concept of social cost is confusing because it can be interpreted both to imply total cost (private plus external) or just external costs.

Unfortunately, however, the moment of clarity at this point soon gave way to more doubts and confusion. Hence, it is time to fulfil my promise in the introduction to end with a section that makes things complicated once again.

Stage III: Cost, free choice and acceptable preferences

As a starting point, one might try to determine whether the cost of enforcing laws on drugs and alcohol should be interpreted as an externality. Clearly, some would argue, the costs related to crime are costs imposed on the non-users by the drug-users. Others might argue that it is equally obvious that it is the non-users who impose the laws that make the use of drugs costly (both by making drugs illegal and deciding the punishment). In that sense the cost of crime is not an unavoidable externality suffered by the non-users.

The same reasoning applies to the cost of treatment. On the one hand it is true that the non-users pay for treatment of drug users (so it sounds like an externality). On the other hand (in Norway) it is mainly the non-users who decide to provide and pay for treatment and because of this it seems wrong to label it an external or social cost. They are after all free not to pay for treatment. Although this is true, one might argue that there are different degrees of freedom when making a choice.[8] The decision to sleep might be used as an example. Usually it is clearly voluntary, but at some point you simply cannot help yourself and you fall asleep whether you want it or not (i.e. involuntary). There might be grey cases in between and this could lead us to conclude that instead of using the dichotomous distinction between a free choice and an involuntary action, we should use a continuum. If (and this is a big if) the same kind of reasoning can be applied to treatment, one might argue that a portion of the treatment cost should be considered an externality (corresponding to the degree to which you believe the non-users do not have a choice but to provide treatment). One might argue that I do not have a fully free choice when faced with a dying person who needs help, but on the other hand not all people who use drugs are "dying people." In any case, the possibility of degrees of freedom makes the analysis of external and social costs very much dependent on the researchers' own views on what it is to be "free" to do something.

The question of voluntary choice is not only relevant to whether something is an external cost or not. Consider the inclusion of the cost of the drug itself in the estimate of cost to society. In

[8] See Elster (1999), especially ch. 5 and ch. 1, for more on the possibility of involuntary behavior. The example of falling asleep is also from him.

standard economic theory it is left to the consumer to evaluate whether something is worth the cost (consumer sovereignty) and the fact that they pay for it by definition demonstrates that they believe it is worth the cost (revealed preference theory). If we then apply standard economic reasoning, the money spent on drugs is always balanced by the utility the person gets from using drugs. Based on this line of reasoning, one should not include the cost of drugs as a social cost.

One could try to counter this (as Collins and Lapsley does) by arguing that money spent on consuming drugs is a cost since the drugs do not satisfy a preference of the "true" self. For instance, one might argue that addiction is some kind of a disease and the act of taking drugs is involuntary. Regardless of the researchers position on this point, the issue illustrates the deeper problems involved in choosing which cost categories to include.

As an economist trained in the theories of rational choice my professional sympathies lies with those who put emphasis on the choice aspect. At first this led me to conclude (using standard theory) that cost of drugs obviously should not be included as a cost. However, after some time I realized that even if we discard the disease theory, it does not automatically follow that we must include the utility from consuming drugs as a benefit. One might, for instance, argue that people have inconsistent preferences as a result of a split between a long-run self and a short-run self.[9] In this case the question depends on whether you believe it is possible to talk about a person being split between a "false" and "true" self and whether we should only count what we perceive as the "true" (long run) self when calculating costs. Although one might accept this as a conceptual possibility, one might also be suspicious of giving researchers a license to engage in metaphysical speculation about costs relative to his choice of a silent true self. It certainly makes the analysis very subjective.

There is, however, a second line of argument that does not rely on a theory of disease or a theory of a split person. The argument is simply that according to a set of criteria some preferences are legitimate and others are not in a calculation of costs and benefits. Consider the following example: Many people dislike seeing drug addicts in the street. Should we count this as a cost to society? If we insist on counting all kinds of preferences, it seems impossible to avoid including this as a cost. On the other hand, if the argument is generalized – say to

[9] See Elster (1986) for more on theories of multiple selves.

Jews – most people would strongly object if we argued that the Jewish immigrants are costly because some people dislike the Jews. Another example is envy and hatred. For the sake of illustration consider a world of two communities, one of which really hates the other. In an analysis of costs and benefits of building a dam in the valley of community *A*, it seems irrelevant to consider as a benefit the "happiness" gained by the other group as a result of knowing that the other community will be destroyed. Hence, it is possible to find examples of preferences that most people agree should not be counted in an analysis of costs and benefits and it is not obviously wrong to discriminate between preferences. The mere possibility, however, does of course not imply that the same logic can be applied to the use of drugs and alcohol. We must ask what it is that makes us exclude some preferences and whether this also applies to the preference for drugs and/or alcohol. Since there is no neutrally accepted theory of "acceptable preferences" we are once again in the realm of the subjective.

Being in the realm of the subjective does not imply that it is impossible to have an informed discussion or that we are free to choose whatever position we want. The conclusions must still be based on correct information and valid logical reasoning. Given the restraint of "informed reason" we can ask whether it is possible to find a set of criteria that excludes the preference for drugs as illegitimate? I do not have a good answer to this question, but let me briefly discuss one possible theory developed by Goodin (1986). He presents five "justifications for censoring utility functions" (Goodin 1986, p. 81-86):

1. *Protecting preference from choice*
   (e.g. Sometimes choice based on incomplete information so the choice does not reveal the person's true preference)
2. *Reciprocal forbearances*.
   (e.g. I agree not to include my preference for how you should behave as long as you agree not to include yours)
3. *Explicit preference for preferences*
   ("Laundering their preferences then simply amounts to respecting their own preferences for preferences." 83)
4. *Implicit preference for preferences*
   (e.g. As implied by other choices?)
5. *Internal logic of preference aggregation*
   (e.g. human sympathy and respect for dignity does not imply respect for all kinds of preferences)

It is important to note here that the argument is not that the researcher is free to impose his own preference on others. According to Goodin (1986, p. 91-92) "overriding a person's

preferences is (on arguments 1-4, at least) *justified in terms of that person's actual preferences*, rather than in terms of some reading of his 'true interests' which he himself does not share." For instance, when faced with a person who uses drugs but claims that he does not want to do so we must decide what his real preferences are: Is it the preference as revealed by his actions or his words? Usually we agree that "actions speak louder than words" but there may be exceptions. If we admit the existence of phenomena like weakness of will (se Elster 1999, p. 173), then we also admit that sometimes words could be a better indication of a person's preferences than his actions. In those cases I would argue that we are justified in not counting the direct utility from using drugs (Based on argument 3 on Goodin's list). This does not, however, apply to those who make informed decision to use drugs and do not express any preference that they wish they did not use drugs.

Conclusion

There is disagreement on the elements that should be included in a study of cost to society. I argued that we could solve some of this disagreement by distinguishing between "cost to society" and "external cost." I also argued that the concept of cost necessarily implies a comparison between the total (realistically) expected consequences (both positive and negative) of two policy alternatives and that several studies did not use the concept of cost in this way. Finally, in the third section I argued that cost estimates cannot be neutral or scientific because they depend strongly on our views on when a choice can be characterized as voluntary and which preferences we consider to be legitimate. Since there is no universally agreed theory on these issues, the cost estimate necessarily becomes subjective.

References

Buchanan, James M. (1969) *Cost and Choice: An Inquiry in Economic Theory*. Chicago: Markham Publishing Press.

Cartwright, William S. (1999) *The Economics of Drug Treatment – Bibliography* June, 1999 http://165.112.78.61/HSR/other/CartwrightEcon.htm

Collins, David J. and Helen M. Lapsley (1991) *Estimating the economic costs of drug abuse in Australia*. Canberra: Australian government publishing service (Monograph series ; 15 / National Campaign Against Drug Abuse)

Elster , Jon (ed.) (1986) *The multiple self*. Cambridge: Cambridge University Press.

Elster, Jon (1999) *Strong Feelings: Emotion, Addiction, and Human Behavior*. Cambridge, Mass.: The MIT Press.

French, Michael T., J. Valley Rachal, Robert T. Hubbard (1991) "Conceptual framework for estimating the social cost of drug abuse", *Journal of Health and Social Policy* 2(3):1-22.

Goodin, Robert E. (1986) "Laundering Preferences" pp. 75-101 in Elster (ed.) (1986) *Foundations of Social Choice Theory*. Cambridge: Cambridge University Press.

Harwood, Henrick J. et al (1998) *Analytical Principles in Estimating the Costs of Alcohol and drug Abuse*, http://www.nida.nih.gov/EconomicCosts/Chapter3.html

Harwood, Henrick J. et al (1999) "Economic costs of alcohol and drug abuse in the United States, 1992: A report", *Addiction* 94(5):631-635.

Healey A. , M. Knapp, J. Austin, M. Gossop, J. Marsden, D. Stewart, P. Lehmann, C. Godfrey (1998) "Economic burden of drug dependency", *British Journal of Psychiatry*, 173: 160-165.

Heien, Dale M. And David J. Pittman (1989) ”The Economic Cost of Alcohol Abuse: An Assessment of Current Methods and Estimates”, *Journal of Studies on Alcohol* 50(6):567-579.

Kleinman, Mark A. R. (1999) “Economic cost’ measurements, damage minimization and drug abuse control policy“, *Addiction* 94(5):638-641.

Robson, Lynda and Eric Single (1995) *Literature Review Of Studies On The Economic Costs Of Substance Abuse, A Report of The Canadian Centre On Substance Abuse*, http://www.ccsa.ca/costslit.htm

Single, Erik & David Collins, Brian Easton, Henrick Harwood, Helen Lapsley and Alan Maynard (1996) *International Guidelines for Estimating the Costs of Substance Abuse*, http://www.ccsa.ca/intguid.htm

Single, Eric; Lynda Ronson, Xie, Xiadio, Jürgen Rehm (1998) “The economic cost of alcohol, tobacco and illicit drugs in Canada, 1992”, *Addiction* 93(7):991-1006.

Single, Eric et al (1999) *The Costs of Substance Abuse in Canada*, http://www.ccsa.ca/costhigh.htm

Xie, Xiadio, Jürgen Rehm, Eric Single and Lynda Robson (1999) “Methodological issues and selected consequences of substance abuse in Ontario”, *Addiction Research* 7(5):417-431.

APPENDIX 1

The Economic Costs of Alcohol and Drug Abuse in the United States - 1992

National Institute on Drug Abuse
National Institute on Alcohol Abuse and Alcoholism

Table 1.1

Economic Costs of Alcohol and Drug Abuse in the United States, 1992
(millions of dollars)

Economic Costs	Total	Alcohol	Drugs
Health Care Expenditures			
Alcohol and drug abuse services	$9,973	$5,573	$4,400
Medical consequences	$18,778	$13,247	$5,531
Total, Health Care Expenditures	***$28,751***	***$18,820***	***$9,931***
Productivity Effects (Lost Earnings)			
Premature death	$45,902	$31,327	$14,575
Impaired productivity	$82,201	$67,696	$14,205
Institutionalized populations	$2,990	$1,513	$1,477
Incarceration	$23,356	$5,449	$17,907
Crime careers	$19,198	-	$19,198
Victims of crime	$3,071	$1,012	$2,059
Total, Productivity Effects	***$176,418***	***$106,997***	***$69,421***
Other Effects on Society			
Crime	$24,282	$6,312	$17,970
Social welfare administration	$1,020	$683	$337
Motor vehicle crashes	$13,619	$13,619	-
Fire destruction	$1,590	$1,590	-
Total, Other Effects on Society	***$40,511***	***$22,204***	***$18,307***
Total	**$245,680**	**$148,021**	**$97,659**

Source: Analysis by The Lewin Group.
Note: Components may not sum to totals because of rounding.

Harwood et al 1998. http://www.nida.nih.gov/EconomicCosts/Table1_1.html

APPENDIX 2

The costs of alcohol, tobacco and illicit drugs in Canada, 1992 (CCSA)	**Alcohol**	**Tobacco**	**Illicit drugs**	**Total ATD**
1. Direct health care costs: total	**$1,300.6**	**$2,675.5**	**$88.0**	**$4,064.1**
---1.1 morbidity-general hospitals	666.0	1,752.9	34.0	2,452.9
-------morbidity-psychiatric hospitals	29.0	--	4.3	33.3
---1.2 co-morbidity	72.0	--	4.7	76.7
---1.3 ambulance services	21.8	57.2	1.1	80.1
---1.4 residential care	180.9	--	20.9	201.8
---1.5 non-residential treatment	82.1	--	7.9	90.0
---1.6 ambulatory care: physician fees	127.4	339.6	8.0	475.0
---1.7 prescription drugs	95.5	457.3	5.8	558.5
---1.8 other health care costs	26.0	68.4	1.3	95.8
2. Direct losses associated with the workplace	**14.2**	**0.4**	**5.5**	**20.1**
---2.1 EAP and health promotion programs	14.2	0.4	3.5	18.1
---2.2 drug testing in the workplace	N/A	--	2.0	2.0
3. Direct administrative costs for transfer payments	**52.3**	**--**	**1.5**	**53.8**
---3.1 social welfare and other programs	3.6	--	N/A	3.6
---3.2 workers' compensation	48.7	--	1.5	50.2
---3.3 other administrative costs	N/A	N/A	N/A	N/A
4. Direct costs for prevention and research	**141.4**	**48.0**	**41.9**	**231.1**
---4.1 research	21.6	34.6	5.0	61.1
---4.2 prevention programs	118.9	13.4	36.7	168.9
---4.3 training costs for physicians and nurses	0.9	N/A	0.2	1.1
---4.4 averting behaviour costs	N/A	N/A	N/A	N/A
5. Direct law enforcement costs	**1,359.1**	**--**	**400.3**	**1,759.4**
---5.1 police	665.4	N/A	208.3	873.7
---5.2 courts	304.4	N/A	59.2	363.6
---5.3 corrections (including probation)	389.3	N/A	123.8	513.1
---5.4 customs and excise	N/A	N/A	9.0	9.0
6. Other direct costs	**518.0**	**17.1**	**10.7**	**545.8**
---6.1 fire damage	35.2	17.1	N/A	52.3
---6.2 traffic accident damage	482.8	--	10.7	493.5
7. Indirect costs: productivity losses	**4,136.5**	**6,818.8**	**823.1**	**11,778.4**
---7.1 productivity losses due to morbidity	1,397.7	84.5	275.7	1,757.9
---7.2 productivity losses due to mortality	2,738.8	6,734.3	547.4	10,020.5
---7.3 productivity losses due to crime	--	--	N/A	N/A
Total	**7,522.1**	**9,559.8**	**1,371.0**	**18,452.9**
Total as % of GDP	*1.09%*	*1.39%*	*0.20%*	*2.67%*
Total per capita	*$265*	*$336*	*$48*	*$649*
Total as % of all substance-related costs	*40.8%*	*51.8%*	*7.4%*	*100.0%*

Single: http://www.ccsa.ca/econtab4.htm