

Public Health Monograph Series

No.2

ISSN 1173-6844

**THE SOCIAL COSTS OF
TOBACCO USE AND ALCOHOL
MISUSE**

Report prepared for the Alcohol Advisory Council of New Zealand, the Health Research Council of New Zealand, and the Public Health Commission.

BRIAN EASTON

**Department of Public Health,
WELLINGTON SCHOOL OF MEDICINE
Box 7343
Wellington South**

April 1997

CONTENTS

Introduction and Acknowledgements	i
Executive Summary	iii
1. The Cost-of-Illness Framework for Measuring the Social Costs of Substance Abuse	1
2. The Social Costs of Tobacco Use	7
3. The Social Costs of Alcohol Misuse	16
4. Conclusion: Comparing the Social Costs of Tobacco Use and Alcohol Misuse	26
<i>Appendices</i>	
1. The Value of Life	31
2. The Value of Life in New Zealand	33
3. The Problem of Valuation when the Consumer is Addicted	34

INTRODUCTION AND ACKNOWLEDGEMENTS

This report has been prepared for the Alcohol Advisory Council of New Zealand (ALAC), the Health Research Council of New Zealand (HRC), and the Public Health Commission (PHC). These organizations commissioned the researcher to bring together and extend the existing fragmented estimates of various aspects of the social consequences of tobacco use and alcohol misuse in New Zealand, into a rigorous analytic framework which evaluates the social cost of this licit drug abuse.¹ I am grateful for the opportunity they gave me and the challenge they set.

I am also grateful for assistance from various people. The study arises partly out of a project in which I have been involved to provide international guidelines for the measurement of licit and illicit drug abuse.² The help of the other members of the working party has been invaluable: David Collins (Australia), Rick Harwood (USA), Helen Lapsley (Australia), and Alan Maynard (UK), energetically and exceptionally led by Eric Single (Canada). In addition I am grateful for various contributions from the members of the two international symposia on the topic held at Banff (1994) and Montreal (1995), organized by the Canadian Centre on Substance Abuse, and am pleased to have this opportunity to acknowledge the funding agencies who made my attendance possible: ALAC, the PHA, and the Land Transport Safety Authority.

I am also delighted to be able to thank a number of colleagues who have supported this work in various ways, especially Rob Bowie of the Department of Public Health, Wellington School of Medicine, with whom I have had an ongoing dialogue about the project, and who edited the final report. Murray Laugeson of Health New Zealand has been another enormous strength, especially in the area of tobacco use, while the team at ALAC, especially Nancy Fithian and Mike MacAvoy, have made similar contributions to the alcohol part of the study. Others who have contributed in one way or another include Jane Chetwynd (Department of Public Health and General Practice, Christchurch School of Medicine), Mike Cooper (Central Institute of Technology), Nancy Devlin (Department of Economics, University of Otago), and Guy Scott (Wellington Polytechnic). Alistair Woodward and his

¹ While, as the chapters explain, the concern is with tobacco *use* and alcohol *misuse*, the text uses the term *abuse* to cover both phenomenon.

² E. Single, D. Collins, B. Easton, H. Harwood, H. Lapsley, & A. Maynard. *International Guidelines for Estimating the Costs of Substance Abuse*, Canadian Centre on Substance Abuse, Toronto, 1996 (latest version).

team at the Department of Public Health, Wellington School of Medicine, where I hold an honorary lectureship, have provided a friendly and supportive base for my research program on health economics.

(ii)

There is one other person I would like to thank - regrettably posthumously. Professor Tony Rayner died in 1992 at the age of 51. Tony and I worked together as econometricians at the University of Canterbury in the 1970s. It was both a productive relationship and a friendship one, which I am glad to recall in a report which uses the work he did (with Jane Chetwynd) as one of its key sources. In this report both his memory and some of his research live on.

Neither the funders, nor anyone else or any other agency mentioned in this introduction or the body of the report, are responsible for any assumptions, errors, omissions, estimates or conclusions in the report. While the author takes full responsibility for the content of the report, its estimates and conclusions must be read in the context of the analytical methods, assumptions, and caveats described in it. The estimates are also, of course, subject to a margin of error.

Nevertheless by bringing together the existing fragmented studies, and putting them into a rigorous framework, the study hopes to make a small contribution to dealing with these two serious issues in public health.

BRIAN EASTON,
Honorary Lecturer,
Department of Public Health,
WELLINGTON SCHOOL OF MEDICINE.
(eastonbh@wnmeds.ac.nz)

(iii)

EXECUTIVE SUMMARY

1. **Social Cost of Drug Abuse studies are an example of cost-of-illness studies.**
2. **Cost-of-illness studies are based upon the valuation of the additional costs and benefits of a carefully specified counterfactual scenario.**
3. **The counterfactual scenarios used in this study are:**

Tobacco Use: There is, and has been, no consumption of tobacco and the alternative consumption and other activities are benign.

Alcohol Misuse: Alcohol consumption which exceeds a "safe" limit does not occur, and people change their behaviour for consumption levels below that, so their behaviour is not inappropriate.

4. **In the counterfactual scenario, people live longer and have a healthier life (*the intangible costs*), and there is less expenditure both directly and indirectly associated with the drug consumption (*the tangible costs*), which also have to be adjusted for any benefits from the consumption of the drugs.**

5. **The estimates of the social costs for tobacco use and alcohol abuse for the 1990 year are summarized in the accompanying table.**

6. *Tobacco Use*

The use of tobacco has

- reduced the New Zealand population by about 2.0 percent;
- reduced the overall quality of life (intangible costs) by about 3.2 percent (including the population loss);
- reduced the available material goods and services (tangible costs) by around 1.7 percent (of GDP).

7. *Alcohol Misuse*

The misuse of alcohol has

- reduced the New Zealand population by about 0.8 percent;
- reduced the overall quality of life (intangible costs) by about 2.0 percent (including the population loss);
- reduced the available material goods and services (tangible costs) by around 4.0 percent (of GDP).

(iv)

8. The study concludes that:

***THE SOCIAL COSTS OF TOBACCO MISUSE AND TOBACCO ABUSE ARE
VSSQ - VERY SIGNIFICANT, SOME QUANTIFICATION.***

SOCIAL COSTS of TOBACCO USE & ALCOHOL MISUSE
Measured Relative to Stated Counterfactual Scenarios
(1990)

	<u>Tobacco</u>	<u>Alcohol</u>
	\$m	\$m
<i>Intangible</i>		
Effect of population mortality	14,000	6,000
Effect of population morbidity	7,250	7,200
<i>Tangible</i>		
Reduced production from mortality		
400 600		
Reduced production from morbidity		
145 1,200		
Additional resources from consumption		
580 900		
Additional resources from not have to treating induced diseases and other consequences	205	750
<u>Less</u>		
Benefits from consumption	-125	-540
TOTAL COSTS FROM ABUSE	22,470	16,110
<i>Intangible Costs</i>		
Total	21,250	13,200
Percentage of total human capital	3.2%	2.0%
<i>Tangible Costs</i>		
Total	1,220	2,910
Percentage of GDP	1.7%	4.0%
<i>Population Decrease</i>	2.0%	0.8%

CHAPTER 1:
THE COST-OF-ILLNESS FRAMEWORK TO
THE SOCIAL COSTS OF SUBSTANCE ABUSE

Introduction

The evaluation of the social costs of substance abuse belongs to the genre of cost-of-illness studies (COI).³ Superficially a COI involves combining an epidemiological data base with an accounting one, to generate an amount valued in monetary terms which purports to say something about the costs (usually) to society of a particular disease. Typically the magnitude is large - or large enough - to be used to draw attention to that illness or health problem as one to which policy makers, research funders, and researchers ought to pay attention. Nevertheless COI is not simply a matter of generating a gee-whiz figure designed to give a significant place to this or that disease in the public debate.

So what is the purpose of undertaking rigorous cost-of-illness studies? A short answer is that since they will be done, rigorous or otherwise, the public is entitled to a quality benchmark against which individual studies can be assessed. Without such a benchmark there will be a tendency by those concerned with a particular illness or treatment, to exaggerate the social cost of the illness, by using non-rigorous, unorthodox, or otherwise inappropriate, procedures.

But there are positive reasons as well. An order of magnitude is useful: for instance, the Collins and Lapsley conclusion that abuse from alcohol and tobacco far exceeds in social costs the abuse from illicit drugs in Australia helps focus attention on public policy towards the licits.⁴ Is this conclusion true for other countries? The categories of cost may also draw our attention to specific areas which need public attention, or where specific measures may be effective. The nation is anxious about the consequences of drunken driving. But as we shall see, there are many other costs from alcohol abuse which are greater than this.

³ For a detailed account of the practice of Cost-of-Illness studies see R.D. Bowie, B.H. Easton, G Scott, & H. Scott, *A Manual for Economic Evaluation of Health Services in New Zealand*, forthcoming.

⁴ D. Collins & H. Lapsley, *The Social Costs of Drug Abuse in Australia in 1988 and 1992*, Commonwealth Department of Human Services and Health, 1996.

More fundamentally, COI can be a precursor to evaluation, especially to a *cost-benefit analysis* (CBA). For the COI is almost the benefit side of a CBA and, if done properly, it could be readily adapted into the full benefit side. The reason why the COI is close to the benefit of a CBA is that being the cost difference between situation A and situation B (the actual and counterfactual scenarios), the COI measures the benefit (i.e. avoided cost) between situation B and situation A. The CBA approaches the issue in exactly the same way. Thus there are practical advantages in integrating COI with CBA. It is enormously helpful for those who carry out CBAs and other related evaluations if they can use an existing (comprehensive) COI. Given there are COIs on an increasingly wide range of illnesses, ideally the COI might be selected "off the shelf", if it had been carried out using a CBA framework. This would save the evaluator a substantial amount of work.

We are still some distance from the regular application of CBA to approaches for the prevention of substance abuse. In the interim, measurement of social costs of substance abuse bring that day closer, while the magnitudes shed light on the enormity of the problem, and the significance of its various components.

Opportunity Cost and the Counterfactual Scenario

At the heart of the economist's approach is that all relevant costs are *opportunity costs*. One activity (such as substance abuse) prevents resources being used for some other activity, which is an opportunity foregone. Thus COI rest on the proposition that if the illness were not to exist then the resources that a society uses for treatment and other related purposes could be deployed in some other way.

Sitting behind the opportunity cost is a *counterfactual scenario*, that is a description of an alternative state of affairs, via which the opportunity cost would be assessed. Often the counterfactual proposition is not controversial. For instance we might assume in a COI of a viral infection, that the alternative scenario was no viral infection. In other contexts the alternative can be more contentious. For instance the counterfactual to a situation of alcohol abuse, might be that the abusers switch their consumption to mineral water and other health enhancing commodities, or it might be that abusers switch their consumption to narcotics. Another example of the need for precision in defining the counterfactual is where we might want to distinguish a situation of a drug never having been introduced into a country (which involves a retrospective change to the nation's history), with the scenario where all abusive use of that drug stops at a point in time (involving a prospective change). The difference is that the second scenario involves ongoing costs from past substance abuse (unavoidable costs) in the counterfactual scenario.

The fundamental economic framework for carrying out the comparison between the scenarios (in effect for the combining of the epidemiological with the accounting data base) is "value theory", the role and interpretation of market price, which has been developed rigorously over the post-war period. One practical application of that theory is in the *System of National Accounts* (SNA) - best know for the Gross Domestic Product (GDP) measure of total market activity. The SNA approach is related to, and leads on to, cost-benefit analysis. Either, or both, inform COI.

Cost-of-illness in a System of National Accounts Framework

There is an obvious parallel between cost-of-illness and the System of National Accounts in that each combines a data base with accounting information to generate an aggregate statistic valued in monetary terms. The COI uses mainly epidemiological data, and the SNA uses expenditure and production data.

The SNA is not an arbitrary set of decisions about what is to be included and how each item is to be valued. Rather the aim is to encompass all market transactions valuing them at their marginal private value (or utility), which is usually equal to the market price. The resulting aggregate, usually GDP, can be interpreted as follows. An increase of so many monetary units reflects an increase in the sum of consumer utility measured, in the same monetary units. (Hence the requirement that the prices at which resources involved in transactions should reflect the social values of the resources.)

To appreciate the significance of COI estimates in this framework, consider the counterfactual situation where people choose not to eat potatoes, but switch their expenditure to other products such as kumera. There will be a disruption among potato producers, but this will be offset by an expansion of kumera production. We take these two effects as (largely) balancing out, in which case there will be no change in GDP, even though there is a change in the composition of GDP.

What, we might ask, is the cost-of-potatoes to the economy? An answer might be that it is the cost of production and distribution. However this is offset by the benefits to consumers of eating potatoes. More formally, we see that in the counterfactual situation, where there is no potatoes (but there is kumera), that there is no change in GDP, because of the offsetting behaviour mentioned in the previous sentence. So we assess the social cost-of-potatoes to be zero. (Note that we are not assuming here that the cost of potatoes is zero to consumers. Purchasing potatoes involves a real cost to consumers - the opportunity cost of not being

able to purchase something else - but it is assumed that cost is offset by the benefits of the eating of potatoes.)

None of the above should appear extraordinary. However there are other situations which are far more complex. Consider tobacco consumption. This time our counterfactual is that there is no tobacco consumption, and there has been none in the past, so that smokers switch their consumption to standard commodities (such as potatoes). In effect we are assuming that tobacco was never introduced to the society under consideration, and that potential smokers did not choose another drug (such as cannabis).

At first it might appear that this story is no different from the one about potatoes. But tobacco generates ill-health, which requires medical care. That there was no smoking would mean that a significant quantity of medical resources would no longer be needed for the care of smoking-induced sickness, and could be used for some other purposes. (There are other social costs of smoking, including passive smoking, litter, smoking-induced fires, and the effect of addiction, but we ignore them here to keep the illustration simple.) The counterfactual is a little vague on what the alternative consumption is exactly, but in this context it need not matter, providing it is not damaging to health.

What is critical is that here is a resource use consequential on the smoking, which is not being taken into consideration by smokers in their decision to smoke. Smokers may (or may not), take into account any illness that the activity of smoking may generate, but there is no obligation for them to be concerned about the public sector medical resources that treatment requires.

The distinction here is being made between the *private costs* the smoker incurs by her or his own activity, and the *social costs* which others have incurred for them. It is worth noting, to avoid confusion, that social costs may be incurred by other persons in the private sector (if their private insurance costs are raised by smokers), as well as by public sector expenditure. In the context of COI, "social" is not a synonym for "public", nor "private" for "private sector".

The reduction in medical expenses in the non-smoking scenario is not the only important change as far as GDP is concerned. Total production may be increased because non-smokers are more productive at work, with lower morbidity and lower absenteeism. Production will also be increased because of lower mortality. This additional production under the counterfactual scenario is the *productivity loss* from smoking in the actual situation.

Costs Outside the SNA Framework

There are also effects of an illness (or substance abuse) which are not measured in GDP. A person who is dead is not just a loss in terms of production. We mourn people who die after they retire from the labour force. And while production may be lower because of the illness of a worker, the worker (or a person who is not working) will also suffer from an inferior quality of life through morbidity. Health policy does not just aim to increase output. As well as preventing unnecessary early mortality, health interventions take into account the better life a disease free (or ameliorated) person experiences. Someone suffering from terminal cancer is not experiencing the same quality of life as their non-smoking equivalent who is enjoying the benefits of good health.

It is the practice in COI to extend the SNA framework to allow for these costs. The details of how this is done are described in the later chapters. In summary, an adjustment is made for the loss of life years or *quality adjusted life years (QALYs)* from the illness compared with the counterfactual scenario. In effect added to GDP is another (very much larger) item for the quality of our daily life above that of material consumption.

Another area which is generally excluded from the SNA measurement is the extent to which an addict gets value from their consumption of the addictive drug. In the national accounts, indeed in most of value theory, it is assumed all consumption is valuable to the consumer. Appendix 3 outlines why this assumption does not simply apply to addictive consumption. In the counterfactual scenario, the addict switches to a pattern of consumption which gives her or him greater pleasure - and that additional value needs to be included.

As is well known, the national accounts generally exclude unpaid economic activity (such as child care, housework, and voluntary work). This is not because economists think such activities are unimportant. The issue was recognized right when the National Accounts were being developed. But thus far it has not been possible to develop the rigorous measurement framework to incorporate such activity into an extended national accounting framework. (Another attempt has been initiated with the revised SNA framework announced in 1994, by using "satellite accounts.")

Nonetheless in the current state of the art, COI uses the SNA framework, extended to cover quality of life aspects, but not unpaid economic activity. Where the measurement incorporates the cost of loss of quality of life (or unpaid economic activity) from substance abuse it would be wrong to compare the total with GDP (as "the cost-of-illness is X percent of GDP"), because the numerator and denominator cover different concepts.

Summary of COI

Thus a cost-of-illness study involves assessing the following elements:

In terms of the counterfactual scenario (of, typically, the abuse does not exist):

(1) What is the value of additional resources available for consumption as a result of not having to treat the disease, or its side effects (which may include non-medical effects - in the case of tobacco consumption there would be less litter and fewer accidental fires)?

(2) What is the value of additional resources being available for consumption, as a result of lower mortality and morbidity increasing the effective workforce and production?

(3) What is the value, measured in resource terms, of the lower morbidity and mortality, and superior quality of life?

(4) What is the extra value that an addict would gain were he or she not addicted, and able to use the extra resources to consume some other products?

The sum of these four items amounts to the standard COI, although ideally we would want to include the answer to a fifth question:

(5) What is the value of additional resources effectively available for consumption (and/or leisure) as a result of reduced unpaid economic activity?

It is this framework we use in the next two chapters. Appendices elaborate general issues which appear in the case of substance abuse: the valuation of life (especially as it pertains to an addict), and the valuation of an addict's substance consumption.

In summary the cost-of-illness approach answers the question (measured in national accounting terms as adjusted for quality of life): "How much better off is the nation if the counterfactual scenario applied where the alternative is that there was no drug abuse (or in some cases no drug use at all)?"

CHAPTER 2:
THE SOCIAL COSTS OF TOBACCO USE

Introduction

In the case of tobacco abuse, the easiest and most appropriate counterfactual scenario, is that there has never been any consumption of tobacco and that the alternative consumption was benign. If this had happened New Zealand would have been different because:

(i) its population would be larger (since people would not have died early from tobacco-induced diseases);

(ii) its population would be healthier (since people would not be suffering from tobacco-induced diseases);

(iii) its market production (measured by real GDP) would be larger (since the lower morbidity and mortality from tobacco-induced disease would mean more workers, and higher productivity per worker);

(iv) its market consumption would exclude expenditure on tobacco products, and on activities involved in the treatment of tobacco-induced diseases;

(v) its other consumption would be greater because of the greater market production and the resources that could be diverted from tobacco consumption and treatment.

Each of these features has some economic value to the community, although there is potential double counting in the list (such as market production appearing in item (iii) and item (v)). Eliminating this double counting, we obtain the gross gain from the counterfactual scenario of no tobacco consumption as:

Section 1: the (intangible) value to the community of people living longer (the effects on population mortality) *plus*

Section 2: the (intangible) value to the community of people being healthier in their own right (the effects on population morbidity)⁵ *plus*

Section 3: the (tangible) value loss of production from mortality and morbidity *plus*

Section 4: the (tangible) additional of resources available from not consuming tobacco or treating tobacco related conditions.

Note that the first two items are intangible, in that there are no simple market transactions to measure them, but the latter two tangible items can be measured in market terms.

⁵ Gains from their higher productivity appear in the next item.

To obtain the net social cost of tobacco abuse, we deduct from this total the social benefits of tobacco use. To the above four items we subtract:

Section 5: The benefits to smokers of tobacco consumption.

This paper works through each item of difference in the counterfactual scenario, provides a best measure of its size, and where appropriate values it. The measurement is for the December 1990 year although occasionally the data is based on the March 1991 year.

1. The Impact of Tobacco on Population Numbers

The consumption of tobacco causes early deaths, and thus diminishes the size of the population. How much larger would the population be if there had been no consumption of tobacco? This depends on a series of further assumptions. Two key ones are:

- those who smoke (and die from their consumption) have a similar migration pattern to those who do not;
- that the deaths from tobacco do not affect the number of births.

The second assumption is more contentious, and needs to be elaborated. It would readily apply if all the deaths from smoking occurred after the smokers had completed their family formation. In most cases this is a reasonable approximation. However tobacco consumption by parents is thought to cause SIDS (cot deaths) with 59 percent of all cases attributed to smoking, which will affect the number of births in the next generation, and so on.⁶ Because these numbers accumulate over time, and require numerous heroic assumptions in order to estimate (especially the historical prevalence of SIDS from tobacco consumption), no estimate is included of the impact of SIDS on population size, although the immediate social loss from such deaths is included in the total valuation. More generally, the following estimates are also conservative, in that they make no allowance for deaths from passive smoking, or from active smoking before the age of 35.

⁶ It might be assumed that deaths from SIDS led to a subsequent replacement birth. This does happen, but not for every birth.

The estimated numbers of premature deaths in New Zealand as a result of the use of tobacco for the 1990 year was 4487.⁷ These deaths would not have occurred in that year had there been no smoking. It is estimated that had they not died from tobacco-induced disease they would have lived a further 14 years on average.⁸ Of course under the counterfactual scenario there would have been additional deaths in 1990 from those who had not died earlier from smoking, lived those extra years, and died from other causes.

By taking the estimated number of survivors who avoided tobacco-induced deaths had they not smoked, we can calculate how much bigger the population would have been. This comes to just under 70,000, so the New Zealand population of around 3.35 million in December 1990 would have been about 2 percent bigger.

How do we value these extra 70,000 people, who would have lived in 1990 if they had not smoked tobacco? This involves putting a monetary value on each life. Using the willingness-to-pay approach described in Appendix 1.2, in which each year of good quality life is worth just over \$200,000 in 1990 prices, we calculate the total mortality cost from smoking as \$14.0 billion (70,000 X \$200,000).

This estimate is relatively higher than some overseas studies,⁹ but that is primarily because those studies use a lower value for a life year. The figure of \$14.0 billion should not be compared with GDP (\$73 billion in the March year to 1991¹⁰), since the two are conceptually different: GDP is the market value of goods and services produced, whereas

⁷ D. Peto, A. Lopez, J. Boreham, M. Thun, & C. Heath (1994) *Mortality for Smoking in Developed Countries*, Oxford University Press, Oxford.

The study is conservative because it does not include tobacco induced deaths:

- below the age of 35;
- from passive smoking;
- from medical conditions for which the etiological fraction, or its equivalent, is yet to be calculated.

⁸ The study distinguishes the loss by those under 70 (21 years on average) from those over 70 (8 years on average). The detailed calculations make this distinction, and where necessary an even finer one.

⁹ e.g. D. Collins & H. Lapsley, *The Social Costs of Drug Abuse in Australia in 1988 and 1992*, Commonwealth Department of Human Services and Health, 1996,

¹⁰ GDP reported in the 1995 *New Zealand Official Yearbook* was \$73,126 million measured at market prices, and thus including tobacco excise duty. The counterfactual requires that GDP be measured excluding tobacco excise duty. Even so it would still be \$73 billion to the nearest billion dollars.

the figure for the life years added as a result of avoiding tobacco-induced deaths is a notional value based on willingness-to-pay by the population.

2. THE IMPACT OF TOBACCO ON POPULATION HEALTH

CONSEQUENCES OF TOBACCO ARE NOT ONLY DEATH, BUT POOR HEALTH BEFORE DEATH. VERY OBVIOUSLY THE PREVIOUS SECTION DID NOT INCLUDE THE TRAGEDY OF A PERSON IN THE LATTER STAGES OF TOBACCO-INDUCED CANCER, WHO MAY DIE EARLY IN THE FOLLOWING YEAR. NOR DOES THE FIGURE INCLUDE THE DISCOMFORT OF SOMEONE EXPERIENCING RESPIRATORY DIFFICULTIES BECAUSE THEY SMOKE.

IT IS NOT EASY TO SUMMARIZE THESE EXPERIENCES IN DOLLAR VALUES. THERE IS NOT GOOD DETAILED INFORMATION ABOUT THE INCIDENCE OF THE MORBIDITY FROM SMOKING (EXCEPT IN SPECIFIC CASES), AND THERE IS NO MEASURED (LET ALONE AGREED) VALUATION OF THE REDUCTIONS IN QUALITY AS A RESULT OF THE MORBIDITY. WE PROCEED WITH A HEURISTIC INDIRECT ESTIMATE.

IN 1990 ABOUT 28 PERCENT (725,000 PEOPLE) OF ALL NEW ZEALAND ADULTS (OVER THE AGE OF 15) SMOKED CIGARETTES.¹¹ A CONSERVATIVE ESTIMATE OF THE MORBIDITY FROM TOBACCO-INDUCED DISEASES MIGHT BE TO ASSUME THAT THESE PEOPLE (ON AVERAGE) EXPERIENCE A DETERIORATION IN THE QUALITY OF THEIR HEALTH BY 5 PERCENT. IT IS TRUE THAT SOME SMOKERS ARE - AT LEAST INITIALLY - UNAFFECTED. BUT OTHERS EXPERIENCE A SEVERE QUALITY DETERIORATION TOWARDS THE END OF THEIR LIFE. MOREOVER THE FIGURE HAS TO INCLUDE MORBIDITY ASSOCIATED WITH SMOKING BY EX-SMOKERS AND FROM PASSIVE SMOKING (INCLUDING LOW BIRTH WEIGHT, GLUE EAR, PNEUMONIA AND ASTHMA AMONG CHILDREN WHOSE PARENTS SMOKE¹²).

THE 5 PERCENT ASSUMPTION IS EQUIVALENT TO A FIGURE OF \$10,000 PER YEAR PER PERSON, IF THE LOSS OF A FULL LIFE YEAR IS \$200,000. ACROSS THE ENTIRE 725,000 THIS AMOUNTS TO \$7.25 BILLION A YEAR, AN AMOUNT ABOUT HALF THE VALUE ESTIMATED FOR TOBACCO-INDUCED MORTALITY.

¹¹ OTR SPECTRUM RESEARCH REPORTED IN *Factsheet, 95.05*, Public Health Commission. The prevalence is down from 36 percent in 1976.

¹² E.A. MITCHELL *Monitoring of the New Zealand SIDS Prevention Programme*, unpublished report to the Public Health Commission, 1994.

3. THE LOSS OF PRODUCTION

THERE ARE TWO MAIN SOURCES OF LOSS OF PRODUCTION: SOME SMOKERS ARE DEAD DURING WORKING AGES, AND MANY HAVE REDUCED PRODUCTIVITY.

MOST OF THE 70,000 WHO WOULD HAVE BEEN ALIVE IN 1990, HAD THERE BEEN NO TOBACCO CONSUMPTION WOULD HAVE BEEN PASSED THE RETIREMENT AGE. IT IS ESTIMATED THAT THERE WOULD HAVE BEEN AROUND 11,000 OF THE 70,000 BELOW THE AGE OF 60. SOME 79 PERCENT OF THE POPULATION BETWEEN THE AGES OF 35 AND 59 REPORTED THEY WERE IN THE LABOUR FORCE, SO WE CAN ASSUME THE LABOUR FORCE WOULD HAVE HAD 8,700 MORE WORKERS (.79 X 11,000) IF THERE HAD NOT BEEN MORTALITY FROM TOBACCO CONSUMPTION. THE LABOUR FORCE WOULD BE 0.55 PERCENT LARGER. ASSUMING THOSE WORKERS WERE AS PRODUCTIVE AS THE AVERAGE MEMBER OF THE LABOUR FORCE, GDP WOULD ALSO HAVE BEEN 0.55 PERCENT, OR \$400 MILLION LARGER, IN THE 1990 YEAR, IF THOSE SMOKERS HAD STILL BEEN ALIVE.¹³

ESTIMATING THE PRODUCTION LOSSES FROM MORBIDITY ARISING FROM TOBACCO-INDUCED DISEASE IS LESS STRAIGHT FORWARD. IT COVERS LOWER PRODUCTIVITY ON THE JOB FROM ILLNESS, HIGHER ABSENTEEISM, AND ALSO ANY PRODUCTION LOSSES FROM TIME OFF WORK IN ORDER TO SMOKE. COLLINS AND LAPSLEY CALCULATE A PRODUCTION LOSS (EXCLUDING ABSENTEEISM) IN AUSTRALIA FROM TOBACCO-INDUCED MORBIDITY EQUAL TO .06 PERCENT OF GDP.¹⁴ ON A COMPARABLE BASIS THAT WOULD SUGGEST THE EQUIVALENT FOR NEW ZEALAND OF AROUND \$45 MILLION.

IT HAS BEEN ESTIMATED THAT THE AVERAGE SMOKER HAS AN ADDITIONAL 5 TO 6 HOURS A YEAR OFF WORK RELATIVE TO THE NON-SMOKER.¹⁵ ALLOWING FOR THE EFFECTS OF THOSE

¹³ THERE ARE A NUMBER OF OTHER ASSUMPTIONS IMPLICIT HERE, INCLUDING THAT IF THE POPULATION HAD BEEN LARGER THERE WOULD HAVE BEEN THE ASSOCIATED CAPITAL AND TECHNOLOGICAL INVESTMENT. MOREOVER WE HAVE ASSUMED THE SAME RATE OF UNEMPLOYMENT AMONG THE ADDITIONAL WORKERS AS THE POPULATION AS A WHOLE, AND THE SAME RATE OF AVERAGE PRODUCTIVITY. BOTH OF THESE ASSUMPTIONS MAY BE CONSERVATIVE, BECAUSE ADOLESCENT AND YOUNG ADULT WORKERS (WHO ARE NOT IN THIS GROUP) ARE MORE LIKELY TO BE UNEMPLOYED, AND WORK AT A LOWER LEVEL OF PRODUCTIVITY WHEN THEY ARE EMPLOYED, THAN THE AVERAGE.

¹⁴ *ibid.*

¹⁵ M. BATENBURG & J. REINKEN (1995) "THE RELATIONSHIP BETWEEN SICKNESS, ABSENCE FROM WORK AND THE PATTERN OF CIGARETTE SMOKING", *NZ Med J* (1990) vol 103 p.11.

WHO HAVE GIVEN UP SMOKING THIS IS CLOSE TO LOSING ONE WORKING DAY A YEAR BECAUSE OF A TOBACCO-INDUCED ILLNESS. THERE ARE ABOUT 400,000 SUCH WORKERS. THE NET LOSS FROM PRODUCTION WOULD BE ABOUT \$90 MILLION. THIS SUGGESTS THE TOTAL PRODUCTIVITY LOSS FROM MORBIDITY IS AROUND \$135 MILLION A YEAR, AND THE TOTAL LOSS FROM MORBIDITY AND MORTALITY IS \$535 MILLION (FOR THE 1990 YEAR), OR ABOUT .7 PERCENT OF GDP.

4. RESOURCES DIVERTED FOR TOBACCO CONSUMPTION.

IF THERE HAD BEEN NO SMOKING, THERE WOULD ALSO BE RESOURCES FROM THE CONSEQUENCES OF TOBACCO CONSUMPTION, WHICH WOULD BE RELEASED FOR OTHER PURPOSES. THE ACTIVITIES WHICH USE THESE RESOURCES ARE:

- THOSE USED FOR TOBACCO CONSUMPTION DIRECTLY;
- THOSE USED FOR TREATMENT OF HEALTH CARE AS A RESULT OF TOBACCO-INDUCED ILLNESS;
- THOSE USED FOR FIGHTING ACCIDENTAL FIRES CAUSED BY TOBACCO USAGE, AND DEALING WITH THE DAMAGE FROM SUCH FIRES;
- THOSE USED FOR CLEANING UP ANY LITTER FROM TOBACCO USAGE.¹⁶

DIRECT CONSUMPTION

THE RESOURCES DIVERTED FOR TOBACCO CONSUMPTION ARE THE COST OF THE CONSUMPTION EXCLUDING EXCISE DUTY.¹⁷ CONSUMPTION EXPENDITURE ON TOBACCO PRODUCTS WAS ESTIMATED BY STATISTICS NEW ZEALAND TO BE \$1142 MILLION IN THE 1990/1 YEAR, OR \$580 MILLION WITHOUT EXCISE DUTY.

HEALTH SECTOR SPENDING

THE ESTIMATED COSTS TO THE PUBLIC HEALTH SERVICE WERE \$185.4 MILLION DOLLARS IN 1989,¹⁸ SAY \$205 MILLION IN 1990, AFTER ALLOWING FOR INFLATION AND ADDING AN EXTRA \$10 MILLION TO COVER THE ADMINISTRATIVE COSTS INVOLVED.

¹⁶ STRICTLY THERE SHOULD ALSO BE AN IMPUTATION FOR THE SOCIAL HARM (INCLUDING UNSIGHTLINESS) FROM LITTER THAT IS NOT TIDIED UP.

¹⁷ GST IS INCLUDED, SINCE IT IS IMPOSED ON (JUST ABOUT) ALL RESOURCE USAGE. THE RESOURCES USED IN THE COUNTERFACTUAL SCENARIO WOULD HAVE GST IMPOSED UPON THEM, AND THE COMPARISON IS MADE WITH GDP MEASURED TO INCLUDE GST.

¹⁸ D. PHILLIPS, I. KAWACHI, & M. TILYARD "THE COSTS OF SMOKING REVISITED", *NZ Med J* (1992) vol 105, p.240-2.

COSTS FROM TOBACCO-INDUCED EXPENDITURE

THE NEW ZEALAND FIRE SERVICE ESTIMATES THAT 3.7 PERCENT OF ALL FIRES THEY DEALT WITH IN 1990 WERE CAUSED BY CIGARETTES OR OTHER CONTROLLED HEAT SOURCE (SUCH AS HOT ASHES AND TOBACCO EMBERS), BUT EXCLUDING FIRES CAUSED BY PEOPLE FALLING ASLEEP WHILE SMOKING.¹⁹ HOWEVER WE DO NOT HAVE ANY ESTIMATE OF THE VALUE OF THE DESTRUCTION (PLUS ASSOCIATED INSURANCE COSTS). SINCE ALL GENERAL AND FIRE INSURANCE OPERATING EXPENDITURE IN 1990/91 CAME TO \$1367 MILLION, INCLUDING COVERAGE FOR LOST PROPERTY AND THEFT, AN ORDER OF MAGNITUDE OF LOSSES WHICH COULD BE ATTRIBUTED TO SMOKING-INDUCED FIRES (INCLUDING THOSE NOT COVERED BY INSURANCE) MIGHT BE ABOUT \$15 MILLION A YEAR.

An earlier estimate was A. Gray, J. Reinken, & M. Laugeson "The Cost of Cigarette Smoking in New Zealand, *NZ Med J* (1988) vol 101, p.270-3.

¹⁹ FETTER, R. VAN HOEFF, NEW ZEALAND FIRE SERVICE, 13 SEPTEMBER 1995.

LITTER

THERE WOULD APPEAR TO BE NO ESTIMATES IN AUSTRALASIA FOR THE COSTS OF TOBACCO-INDUCED LITTER.

SUMMARY

IN TOTAL, HAD THERE BEEN NO TOBACCO CONSUMPTION IN NEW ZEALAND, UP TO 1990, THE COMMUNITY WOULD HAVE HAD AROUND AN EXTRA \$785 MILLION OF RESOURCES FOR OTHER PURPOSES. THIS CONSERVATIVE FIGURE, WHICH OMITTS FIRE AND LITTER COSTS, AMOUNTS TO 1.1 PERCENT OF GDP.

5. THE BENEFITS OF TOBACCO CONSUMPTION

NORMALLY ECONOMICS VALUES THE BENEFITS OF THE CONSUMPTION OF ANY GOODS AND SERVICES AT THE COST OF THE OUTLAYS UPON THEM, ALTHOUGH A MORE SOPHISTICATED ANALYSIS WOULD ALSO INCLUDE AN ESTIMATE OF THE CONSUMER SURPLUS, WHICH IS THE ADDITIONAL BENEFIT (UTILITY) WHICH THE CONSUMER GETS ABOVE THAT WHAT IS PAID. HOWEVER THIS ADJUSTMENT WOULD HAVE TO BE MADE TO EVERY ITEM AND NOT JUST TOBACCO CONSUMPTION, SO FOR CONSISTENCY WE KEEP TO THE ORTHODOX MEASURE.

IN ANY CASE IT CAN BE ARGUED THAT THIS MEASURE IS INAPPROPRIATE BECAUSE TOBACCO IS ADDICTIVE. THE ARGUMENT IS SET OUT IN APPENDIX 3 BUT, BRIEFLY, PEOPLE ARE ADDICTED IF THEY WOULD LIKE TO GIVE UP (OR CUT DOWN) BUT ARE UNABLE TO. THEIR PERSONAL COUNTERFACTUAL IS THAT IF THEY HAD NEVER STARTED SMOKING THEY WOULD BE BETTER OFF. THAT TRANSLATES INTO A COUNTERFACTUAL SCENARIO IN WHICH THEY OBTAIN NO BENEFIT FROM THEIR SMOKING, RELATIVE TO A SITUATION WHERE THERE HAD NEVER BEEN TOBACCO AVAILABLE.²⁰

²⁰ THERE MAY BE AN ELEMENT OF DOUBLE COUNTING HERE, SINCE SOME SMOKERS MAY WISH THEY HAD NEVER STARTED SMOKING BECAUSE OF THE HEALTH COSTS THEY ARE ALREADY EXPERIENCING. SUCH HEALTH COSTS APPEAR IN THE ESTIMATES OF THE INTANGIBLE COSTS OF MORBIDITY. HOWEVER MANY SMOKERS (AND EX-SMOKERS) MAY ANTICIPATE AN, AS YET, UNREALIZED DETERIORATION OF THEIR HEALTH. THAT IS NOT INCLUDED IN THE MORBIDITY ESTIMATE, BUT MAY REDUCE THE BENEFIT TO THEM OF SMOKING.

COLLINS AND LAPSLEY ESTIMATED THAT 89 PERCENT OF ALL TOBACCO CONSUMPTION IN AUSTRALIA WAS ADDICTIVE, GIVING NO BENEFIT TO THE CONSUMER RELATIVE TO THE COUNTERFACTUAL SCENARIO.²¹ THUS THERE IS AN OFFSET OF BENEFITS FROM SMOKING EQUAL TO 11 PERCENT OF OUTLAYS, OR \$125 MILLION.²²

²¹ *ibid.*

²² NOTE THAT THIS IS MEASURED AT MARKET PRICES, RATHER THAN FACTOR COSTS, BECAUSE THE MARKET PRICE REFLECTS THE WILLINGNESS TO PAY, AND HENCE THE UTILITY/BENEFIT EXPERIENCED. ON THE OTHER HAND THE FIGURE OF 70 PERCENT EXCLUDES THOSE WHO AT A LATER DATE WISH THEY COULD STOP.

TABLE 2.1

SOCIAL COSTS OF TOBACCO CONSUMPTION
Measured Relative to Stated Counterfactual Scenario
 (1990)

	\$m
<i>Intangible</i>	
Effect of population mortality	14,000
Effect of population morbidity	7,250
<i>Tangible</i>	
Reduced production from mortality	400
Reduced production from morbidity	145
Additional resources from not consuming tobacco	580
Additional resources from not treating tobacco induced diseases	205
Additional resources because of fewer fires	15
<u>Less</u>	
Benefits from tobacco consumption	-125
 TOTAL COSTS FROM TOBACCO USE	 22,470
 <i>Intangible Costs</i>	
Total	21,250
Percentage of total human capital	3.2%
 <i>Tangible Costs</i>	
Total	1,220
Percentage of GDP	1.7%
 <i>Population Decrease</i>	 2.0%

6. THE SOCIAL COSTS OF SMOKING

THE SEPARATE ESTIMATES DERIVED ABOVE, ARE AGGREGATED TOGETHER IN TABLE 2.1. IN SUMMARY THE NET SOCIAL COSTS OF TOBACCO ABUSE AMOUNTS TO ALMOST \$22.5 BILLION FOR THE 1990 YEAR. THIS ESTIMATE IS SUBJECT TO A VARIETY OF MEASUREMENT PROBLEMS AS DISCUSSED IN THE TEXT, MOST OF WHICH TEND TO MAKE THE FIGURE CONSERVATIVE.²³

²³ IT HAS NOT BEEN POSSIBLE TO ESTIMATE THE SOCIAL COSTS OF PASSIVE SMOKING. AN AUSTRALIAN STUDY FOUND THEY AMOUNTED TO ABOUT .4 PERCENT OF THE COST OF ACTIVE SMOKING. (*The Health Effects of Passive Smoking*, draft report of the NHMRC Working Party, National Health and Medical Research Council, November 1995) If the same proportion applied in New Zealand, despite the Australian and New Zealand figures

BY FAR THE BIGGEST COMPONENT OF THE SOCIAL COST IS THE INTANGIBLE ELEMENT (OF \$21.3 BILLION), WHICH SHOULD BE COMPARED WITH THE TOTAL VALUE OF LIFE YEARS FOR THE POPULATION (OF ABOUT \$630 BILLION). THE FIGURE REPRESENTS A LOSS OF ABOUT 3.1 PERCENT OF THOSE LIFE YEARS AS A RESULT OF THE MORTALITY AND MORBIDITY EFFECTS OF TOBACCO-INDUCED DISEASES.

THE TANGIBLE ELEMENT OF THE COSTS AMOUNTS TO A NET \$1220 MILLION, OR 1.7 PERCENT OF GDP.²⁴ THIS IS COMPOSED OF TWO ITEMS. RESOURCES AVAILABLE FOR CONSUMPTION WOULD BE HIGHER BY 1.9 PERCENT OF GDP, BUT A GROUP OF SMOKERS WITHOUT ACCESS TO TOBACCO WOULD FEEL WORSE OFF TO THE EXTENT OF 0.2 PERCENT OF GDP.

IT SHOULD BE NOTED THAT WHILE THE POPULATION IS 2.0 PERCENT LARGER UNDER THE COUNTERFACTUAL SCENARIO OF NO TOBACCO CONSUMPTION, THE ADDITIONAL RESOURCES AVAILABLE ARE HIGHER BY ONLY 1.8 PERCENT OF GDP, SO THAT PER CAPITA GDP IS SLIGHTLY LOWER (ALTHOUGH THE DIFFERENCE IS PROBABLY WITHIN THE MARGIN OF ERROR, ESPECIALLY AS THE LATTER FIGURE HAS A NUMBER OF OMISSIONS).

7. CONCLUSION

having some conceptual differences, the inclusion of passive smoking would add a further \$100m to the estimate.

²⁴ **GIVEN THE LOSSES FROM MARKET PRODUCTION ARE AROUND 1.7 PERCENT OF GDP, WE MIGHT ASSUME THAT, UNTIL THERE IS A DIRECT ESTIMATE, THE COMPARABLE LOSS TO NON-MARKET PRODUCTION (E.G. CHILDCARE, HOUSEWORK) WOULD ALSO BE ABOUT 1.7 PERCENT OF THE TOTAL VALUE OF NON-MARKET PRODUCTION.**

THE CURRENT BEST ESTIMATE FOR THE ECONOMIC AND SOCIAL COSTS OF TOBACCO USAGE IS AROUND \$22.5 BILLION FOR THE 1990 YEAR. THIS IS SUBSTANTIALLY HIGHER THAN THE PREVIOUS ESTIMATES. THE DIFFERENCE ARISES PRIMARILY FROM THE DIFFERENCES IN THE VALUATION OF THE REDUCED POPULATION AND POORER HEALTH AS A RESULT OF TOBACCO-INDUCED DISEASES. WE HAVE USED AN OFFICIAL FIGURE DERIVED FROM LAND TRANSPORT STUDIES WHICH VALUES THE AVOIDING OF DEATH AT \$200,000 A LIFE YEAR SAVED. IT IS THESE MORTALITY AND MORBIDITY EFFECTS WHICH DOMINATE THE VALUATION - AS THEY ALREADY DOMINATE OUR THINKING ABOUT THE ILL-EFFECTS OF TOBACCO USE.

CHAPTER 3: THE SOCIAL COSTS OF ALCOHOL MISUSE

INTRODUCTION

IT IS NOT EASY TO SPECIFY A PRECISE COUNTERFACTUAL IN THE CASE OF ALCOHOL MISUSE. IN THE CASE OF TOBACCO THE EASIEST APPROPRIATE COUNTERFACTUAL IS THAT THERE HAS NEVER BEEN ANY CONSUMPTION OF TOBACCO. THIS COUNTERFACTUAL IS APPROPRIATE BECAUSE ALL TOBACCO CONSUMPTION IS THOUGHT TO BE DAMAGING. ON THE OTHER HAND SOME ALCOHOL CONSUMPTION IS BENIGN, AND SOME MAY EVEN BE BENEFICIAL.

BASICALLY THERE SEEMS TO BE TWO CLASSES OF ALCOHOL MISUSE: EXCESSIVE ALCOHOL CONSUMPTION, AND INAPPROPRIATE ALCOHOL CONSUMPTION. ONE COUNTERFACTUAL APPROACH WOULD BE TO IDENTIFY EACH OCCURRENCE WHERE ONE OF THESE OCCURRED, AND ASSUME THE SCENARIO IN WHICH THE PARTICULAR EVENT DID NOT HAPPEN. BUT THAT IS IMPRACTICABLE. THE ONE CHOSEN HERE IS THAT ALCOHOL CONSUMPTION WHICH EXCEEDS A "SAFE" LIMIT DOES NOT OCCUR, AND THAT PEOPLE CHANGE THEIR BEHAVIOUR FOR CONSUMPTION LEVELS BELOW THAT, SO THEIR BEHAVIOUR IS NOT INAPPROPRIATE.²⁵

WE ASSUME THAT THE CHANGE OF BEHAVIOUR IS ULTIMATELY COSTLESS. THERE MAY BE TRANSITION COSTS, BUT ONCE PEOPLE GET INTO GOOD (OR BETTER) DRINKING HABITS THEY DO NOT REGRET THE CHANGE. THUS OUR QUANTITATIVE ANALYSIS IS PRIMARILY CONCERNED WITH THE EFFECTS OF A REDUCTION OF HIGH INDIVIDUAL CONSUMPTION.

IF THIS HAD HAPPENED NEW ZEALAND WOULD HAVE BEEN DIFFERENT BECAUSE:

(I) ITS POPULATION WOULD BE LARGER (SINCE PEOPLE WOULD NOT HAVE DIED EARLY FROM ALCOHOL-INDUCED DISEASES);

(II) ITS POPULATION WOULD BE HEALTHIER (SINCE PEOPLE WOULD NOT BE SUFFERING FROM ALCOHOL-INDUCED DISEASES);

²⁵ WHILE A "SAFE" LIMIT IS SOMETIMES SAID TO BE THREE GLASSES PER DAY FOR A MALE AND TWO FOR A FEMALE, IT ALSO VARIES BY OTHER CIRCUMSTANCES. FOR SOME PEOPLE ZERO ALCOHOL CONSUMPTION IS THE ONLY "SAFE" LIMIT.

THIS CLUMSY DEFINITION IS NECESSARY BECAUSE WHILE THE SAFE LIMIT IS AN AVERAGE, IT DOES NOT PRECLUDE OTHER CIRCUMSTANCES SUCH AS DRINKING WHILE ON MEDICATION. YOUNGER ADULT DRINKING PATTERNS ALSO PRESENT A DEFINITIONAL PROBLEM. R. JACKSON & R. BEAGLEHOLE, "ALCOHOL CONSUMPTION GUIDELINES: RELATIVE SAFETY VS ABSOLUTE RISKS AND BENEFITS", *The Lancet*, Vol 346, Sept 16, 1995, p.716.

(III) ITS MARKET PRODUCTION (MEASURED BY REAL GDP) WOULD BE LARGER (SINCE THE LOWER MORBIDITY AND MORTALITY FROM ALCOHOL-INDUCED DISEASE WOULD MEAN MORE WORKERS, AND HIGHER PRODUCTIVITY PER WORKER);

(IV) ITS MARKET CONSUMPTION WOULD EXCLUDE EXPENDITURE ON ALCOHOL PRODUCTS, AND ON ACTIVITIES INVOLVED IN THE TREATMENT OF ALCOHOL-INDUCED DISEASES;

(V) ITS OTHER CONSUMPTION WOULD BE GREATER BECAUSE OF BOTH THE GREATER MARKET PRODUCTION AND THE RESOURCES THAT COULD BE DIVERTED FROM ALCOHOL CONSUMPTION AND TREATMENT.

EACH OF THESE FEATURES HAS SOME ECONOMIC VALUE TO THE COMMUNITY, ALTHOUGH THERE IS POTENTIAL DOUBLE COUNTING IN THE LIST (SUCH AS MARKET PRODUCTION APPEARING IN ITEM (III) AND ITEM (V)). BY ELIMINATING THIS DOUBLE COUNTING WE OBTAIN THE GROSS GAIN FROM THE COUNTERFACTUAL SCENARIO OF NO ALCOHOL CONSUMPTION AS:

SECTION 1: THE (INTANGIBLE) VALUE TO THE COMMUNITY OF PEOPLE LIVING LONGER (THE EFFECTS ON POPULATION MORTALITY) *PLUS*

SECTION 2: THE (INTANGIBLE) VALUE TO THE COMMUNITY OF PEOPLE BEING HEALTHIER IN THEIR OWN RIGHT (THE EFFECTS ON POPULATION MORBIDITY)²⁶ *PLUS*

SECTION 3: THE (TANGIBLE) VALUE OF THE LOSS OF PRODUCTION FROM MORTALITY AND MORBIDITY *PLUS*

SECTION 4: THE (TANGIBLE) ADDITIONAL RESOURCES AVAILABLE FROM NOT CONSUMING ALCOHOL EXCESSIVELY AND FROM NOT HAVING TO TREAT ALCOHOL-RELATED CONDITIONS.

NOTE THAT THE FIRST TWO ITEMS ARE INTANGIBLE, IN THAT THERE ARE NO SIMPLE MARKET TRANSACTIONS TO MEASURE THEM, BUT THE LATTER TWO TANGIBLE ITEMS CAN BE MEASURED IN MARKET VALUE TERMS.

TO OBTAIN THE SOCIAL COSTS OF ALCOHOL MISUSE, WE DEDUCT FROM THIS TOTAL THE SOCIAL BENEFITS OF ALCOHOL USE. TO THE ABOVE FOUR ITEMS WE SUBTRACT:

SECTION 5: ANY BENEFITS TO DRINKERS FROM THEIR CONSUMPTION OF THE EXCESSIVE ALCOHOL, MOST NOTABLY THEIR ENJOYMENT FROM THE DRINKING.

THIS PAPER LOOKS AT EACH ITEM OF DIFFERENCE IN THE COUNTERFACTUAL SCENARIO, PROVIDES A BEST MEASURE OF ITS SIZE, AND VALUES IT IN MONETARY TERMS. THE MEASUREMENT IS FOR THE DECEMBER 1990 YEAR ALTHOUGH SOMETIMES THE DATA IS BASED ON THE MARCH 1991 YEAR.

²⁶ GAINS FROM THEIR HIGHER PRODUCTIVITY APPEAR IN THE NEXT ITEM.

TO MAKE THE COUNTERFACTUAL OPERATIONAL, WE HAVE HAD TO DEFINE SOME ACTUAL LEVEL OF DRINKING REDUCTION IN THE AGGREGATE CONSUMPTION OF ALCOHOL. A 1993 SURVEY SUGGESTS A PLAUSIBLE ORDER OF MAGNITUDE. THE TOP 5 PERCENT OF DRINKERS DRANK A THIRD OF ALL ALCOHOL AVAILABLE FOR CONSUMPTION, AND THE TOP 10 PERCENT OF DRINKERS DRANK ALMOST HALF.²⁷ NOT ALL THE DRINKING BY THE TOP DRINKERS IS EXCESSIVE, WHILE SOME DRINKING, SUCH AS BINGE DRINKING, BY THE REST WOULD BE CLASSIFIED AS MISUSE.

HOWEVER NOT ALL DRINKING IS SUBSTANCE ABUSE. THERE IS EVEN EVIDENCE THAT RELATIVELY LOW LEVELS OF ALCOHOL CONSUMPTION MAY BE BENEFICIAL TO HEALTH FOR SOME PEOPLE, AND EVEN WERE THAT NOT SIGNIFICANT, MOST CONSUMPTION BELOW THE "SAFE" LIMIT IS NO MORE DETRIMENTAL THAN NUMEROUS OTHER DAILY ACTIVITIES.

WE WILL ASSUME, TENTATIVELY, THAT PERHAPS 40 PERCENT OF ALCOHOL CONSUMPTION IS "EXCESSIVE", IN WHICH CASE THE COUNTERFACTUAL ASSUMES THAT CONSUMPTION IS CUT BY THAT AMOUNT. WITH APPROPRIATE CHANGES TO BEHAVIOUR ALCOHOL MISUSE IS THEREBY ELIMINATED. NOTE THAT THE IMPLICIT ASSUMPTION IS THAT THE REDUCTION IN CONSUMPTION OCCURS FROM A CHANGE IN BEHAVIOUR.²⁸

1. THE IMPACT OF ALCOHOL MISUSE ON POPULATION NUMBERS

ALCOHOL MISUSE CAUSES EARLY DEATHS AND, THUS, DIMINISHES THE SIZE OF THE POPULATION. HOW MUCH LARGER WOULD THE POPULATION BE IF THERE HAD BEEN NO MISUSE OF ALCOHOL? THIS DEPENDS ON A SERIES OF FURTHER ASSUMPTIONS. HERE WE MAKE TWO KEY ONES:

- THOSE WHO MISUSE ALCOHOL (OR DIE AS A RESULT OF ITS CONSUMPTION) HAVE A SIMILAR (AGE-ADJUSTED) MIGRATION PATTERN TO THOSE WHO DO NOT;
- THAT THE DEATHS FROM ALCOHOL MISUSE DO NOT AFFECT THE NUMBER OF BIRTHS.

²⁷ ALCOHOL RESEARCH UNIT (1993) *Drinking: Patterns and Problems*. The survey is of drinking in the Auckland region. It is not obvious that a national survey would get markedly different answers.

²⁸ OTHER SCENARIOS COULD BE EXPLORED. FOR INSTANCE, A HIKE IN TAXATION LEADING TO A REDUCTION IN ABUSIVE DRINKING. HOWEVER A HIKE WOULD ALSO REDUCE NON-ABUSIVE DRINKING, SO THAT SCENARIO IS MUCH MORE COMPLICATED.

THE SECOND ASSUMPTION IS MORE CONTENTIOUS, AND NEEDS TO BE ELABORATED. UNDOUBTEDLY DEATHS OCCUR OF YOUNG PEOPLE, WHO IF THEY HAD LIVED, WOULD HAVE HAD MORE CHILDREN. IT IS ALSO POSSIBLE THAT ALCOHOL MISUSE AFFECTS OVERALL FERTILITY OF THOSE WHO SURVIVE, ALTHOUGH THE OVERALL EFFECT COULD BE IN EITHER DIRECTION. FURTHER COMPLICATIONS ARE FOETAL ALCOHOL SYNDROME AND FOETAL ALCOHOL EFFECTS, WHICH MAY INFLUENCE THE WELFARE OF THOSE YET TO BE BORN. THE JUSTIFICATION FOR IGNORING THESE EFFECTS IS THE SIMPLE ONE THAT THERE IS NO SUFFICIENTLY RIGOROUS METHOD FOR QUANTIFYING A MORE REALISTIC SCENARIO.

ROBERT SCRAGG HAS PROVIDED ESTIMATES FOR THE ALCOHOL-RELATED MORTALITY IN NEW ZEALAND FOR THE 1987 YEAR.²⁹ HE FINDS THAT SOME PEOPLE DIE EARLY, BUT ALSO THAT SOME PEOPLE BENEFIT FROM MODERATE DRINKING IN TERMS OF ADDITIONAL LONGEVITY. THE COUNTERFACTUAL ASSUMES THAT THE LATTER EFFECT CONTINUES, BECAUSE ONLY THE ABUSIVE DRINKING IS ELIMINATED. HE CALCULATES, IN TOTAL, THAT 1464 PEOPLE DIED FROM ALCOHOL-INDUCED CAUSES IN 1987.³⁰ ACCORDING TO THE SCRAGG PROCEDURE THOSE WHO DIED IN 1987 LOST AN AVERAGE OF ABOUT 30,000 LIFE YEARS.

WE USE THE PROCEDURE DESCRIBED IN APPENDIX 2 TO VALUE THE EXTRA 30,000 LIFE YEARS OF PEOPLE -WHO WOULD HAVE LIVED IN 1990 IF THEY HAD NOT CONSUMED ALCOHOL - TO OBTAIN A VALUE TO THE COMMUNITY OF \$200,000 X 30,000, OR \$6.0 BILLION.³¹

THE FIGURE IS RELATIVELY HIGHER THAN SOME OVERSEAS STUDIES³² PRIMARILY BECAUSE THEY USE A LOWER VALUE FOR A LIFE YEAR. THE FIGURE OF \$6.0 BILLION CANNOT BE

²⁹ R. SCRAGG "A QUANTIFICATION OF ALCOHOL-RELATED MORTALITY IN NEW ZEALAND", *Aust NZ J Med* (1995) vol 25, p.5-11.

³⁰ THE ESTIMATE OF THOSE WHO BENEFITTED IN TERMS OF LONGER LIFE WAS 1880 SO THAT, IN TOTAL, ALCOHOL CONSUMPTION REDUCED THE NUMBER OF DEATHS. HOWEVER SINCE THOSE WHO DIED TENDED TO BE YOUNGER THAN THOSE WHO SURVIVED, THERE WAS A NET LOSS OF 9525 LIFE YEARS.

³¹ RATHER THAN CALCULATE, AS HERE, ALL THE LIFE YEARS SAVED IF THE DEATHS IN ONE YEAR COULD BE AVOIDED, THE TOBACCO STUDY CALCULATES THE NUMBER OF LIFE YEARS THAT WOULD HAVE BEEN LIVED IF PEOPLE HAD NOT DIED EARLIER FROM TOBACCO-INDUCED DISEASES. THE LATTER PROCEDURE IS THE PREFERRED, BUT IT WAS NOT POSSIBLE TO USE IT IN THE CASE OF ALCOHOL. THE ESTIMATES BY THE TWO PROCEDURES SHOULD BE THE SAME IF THERE WAS A SORT OF EQUILIBRIUM. (THIS WAS NOT SO FOR TOBACCO, BECAUSE OF FALLING CONSUMPTION. NEITHER MIGHT IT FOR ALCOHOL IF FALLING CONSUMPTION REFLECTS REDUCED MISUSE.)

³² E.G. D. COLLINS & H. LAPSLEY, *The Social Costs of Drug Abuse in Australia in 1988 and 1992*, Commonwealth Department of Human Services and Health, 1996,

COMPARED WITH GDP (\$73 BILLION IN THE MARCH YEAR TO 1991), SINCE IT REPRESENTS A DIFFERENT NOTION: GDP IS THE MARKET VALUE OF GOODS AND SERVICES PRODUCED, WHEREAS THE FIGURE FOR THE LIFE YEARS ADDED AS A RESULT OF AVOIDING ALCOHOL-INDUCED DEATHS IS A NOTIONAL VALUE, BASED ON ESTIMATES OF WILLINGNESS-TO-PAY BY THE POPULATION.

2. THE IMPACT OF ALCOHOL MISUSE ON POPULATION HEALTH

THE CONSEQUENCES OF ALCOHOL MISUSE ARE NOT ONLY DEATH, BUT POOR HEALTH BEFORE DEATH. THE ESTIMATES IN THE PREVIOUS SECTION DID NOT INCLUDE THE TRAGEDY OF A PERSON IN THE LATTER STAGES OF ALCOHOL-INDUCED DISEASE WHO MAY DIE EARLY IN THE FOLLOWING YEAR. AND IF WE, AS WE MUST, TREAT HEALTH TO INCLUDE THE WHOLE OF WELL-BEING THEN THOSE SUBJECT TO VIOLENCE OR FAMILY STRESS AS THE RESULT OF ALCOHOL MISUSE BY ANOTHER FAMILY MEMBER ALSO EXPERIENCE POORER HEALTH.

IT IS NOT EASY TO SUMMARIZE THESE EXPERIENCES IN DOLLAR VALUES. NOT ONLY IS THERE SPARSE INFORMATION ABOUT THE INCIDENCE OF THE MORBIDITY FROM ALCOHOL MISUSE, BUT ALSO THERE IS NO MEASURED (LET ALONE AGREED) VALUATION OF THE REDUCTIONS IN QUALITY OF LIFE AS A RESULT OF THE MORBIDITY. COLLINS AND LAPSLEY DID NOT ESTIMATE THE COST OF THIS MORBIDITY, DESCRIBING IT AS "SIGNIFICANT BUT NOT QUANTIFIED".³³ HERE WE PROCEED WITH A HEURISTIC INDIRECT ESTIMATE.

ACCORDING TO *DRINKING: PATTERNS AND PROBLEMS*, 21 PERCENT OF DRINKERS REPORT THEY HAVE HAD SOME HARMFUL EFFECT FROM THEIR OWN DRINKING IN THE PREVIOUS 12 MONTHS, IN AT LEAST ONE OF THE FIVE AREAS OF THEIR LIVES THAT THEY WERE ASKED ABOUT.³⁴ SOME 38 PERCENT OF ALL THOSE SURVEYED REPORTED THAT SOMEONE ELSE'S DRINKING HAD HAD A HARMFUL EFFECT ON AT LEAST ONE OF THREE AREAS OF THEIR LIFE THAT THEY WERE ASKED ABOUT.³⁵ IN MOST CASES THE HARMFUL EFFECT WAS SMALL BUT, EVEN SO, THERE IS A WIDESPREAD REDUCTION IN HEALTH STATUS AS A RESULT OF ALCOHOL MISUSE.³⁶

³³ *ibid.*

³⁴ HOME LIFE, FRIENDSHIPS AND SOCIAL LIFE, HEALTH, WORK OR WORK OPPORTUNITIES, AND FINANCIAL POSITION.

³⁵ HOME LIFE, FRIENDSHIPS AND SOCIAL LIFE, AND FINANCIAL POSITION.

³⁶ *op. cit.*, p.25-33.

IN ORDER TO ASSESS THE LOSS OF QUALITY ADJUSTED LIFE YEARS (QALYS) OF THOSE ALIVE, SUPPOSE WE ASSUME THAT THE 21 PERCENT OF DRINKERS WITH PROBLEMS AVERAGE A REDUCTION IN THEIR QALYS OF 5 PERCENT ARISING FROM THEIR MISUSE OF ALCOHOL, AND THAT 38 PERCENT OF THE ENTIRE POPULATION (INCLUDING CHILDREN AND DRINKERS) HAVE A 1 PERCENT AVERAGE REDUCTION IN QALYS AS A RESULT OF OTHER'S MISUSE OF ALCOHOL.³⁷ THIS REPRESENTS A TOTAL LOSS OF AROUND 36,000 QALYS IN 1990, WHICH WOULD BE VALUED AT \$7.2 BILLION (\$200,000 X 36,000).

³⁷ ONE READER OF AN EARLIER DRAFT COMMENTED THAT "A 1 PERCENT REDUCTION IN QALYS IS MOST LIKELY QUITE AN UNDERESTIMATE." IN WHICH CASE THE ESTIMATE PRESENTED HERE IS BASED ON A CONSERVATIVE ASSUMPTION.

THIS FIGURE IS SUBJECT TO A WIDE MARGIN OF ERROR, ALTHOUGH IT MAY WELL BE CONSERVATIVE.³⁸ IT HAS THE INTERESTING SIGNIFICANCE THAT THE MORBIDITY COSTS OF ALCOHOL MISUSE APPEAR TO BE HIGHER (BY ABOUT 20 PERCENT) THAN THE MORTALITY COSTS. IN OTHER WORDS, THE LOSS TO THE QUALITY OF LIVES OF PEOPLE ALIVE, PROBABLY EXCEEDS THE LOSS FROM DEATH, ON THIS MEASURE. IN THE CASE OF TOBACCO USE, THE MORBIDITY COSTS APPEAR TO BE ABOUT HALF OF THE MORTALITY COSTS.

3. THE LOSS OF PRODUCTION

THERE ARE TWO SOURCES FROM THE LOSS OF PRODUCTION: SOME DRINKERS (AND THEIR VICTIMS) ARE DEAD DURING WORKING AGES, WHILE MANY DRINKERS HAVE REDUCED PRODUCTIVITY.

MOST OF THE LIFE YEARS LOST FROM MORTALITY, HAD THERE BEEN NO ALCOHOL MISUSE, WERE IN THE WORKING AGE GROUPS. THE SCRAGG DATA SUGGESTS THERE WOULD HAVE BEEN AROUND 17,000 MORE PEOPLE IN THE WORKING AGE GROUPS, UNDER THE COUNTERFACTUAL SCENARIO. SOME 79 PERCENT OF THE POPULATION BETWEEN THE AGES OF 35 AND 59 (WHERE MOST WORK TIME IS LOST) REPORTED THEY WERE IN THE LABOUR FORCE, SO IT CAN BE ASSUMED THE LABOUR FORCE WOULD HAVE HAD $.79 \times 17,000 = 13,000$ MORE WORKERS IF THERE HAD NOT BEEN THE MORTALITY FROM ALCOHOL MISUSE. THAT WOULD BE 0.8 PERCENT LARGER. ASSUMING THOSE WORKERS WERE AS PRODUCTIVE AS THE AVERAGE MEMBER OF THE LABOUR FORCE, GDP WOULD ALSO HAVE BEEN 0.8 PERCENT, OR \$600 MILLION LARGER, IN THE 1990 YEAR.³⁹

³⁸ A STUDY OF THE COSTS OF FAMILY VIOLENCE OBTAINED ESTIMATES IN A RANGE FROM \$1.1B TO \$5.3B FOR 1994 (S. SNIVELY, *The New Zealand Economic Cost of Family Violence*, Coopers and Lybrand, December 1994). Not all family violence is attributable to alcohol abuse, but most certainly drinking exacerbates much. The costs of family violence attributable to alcohol abuse is included in the \$6.7b figure.

³⁹ THERE ARE A NUMBER OF OTHER ASSUMPTIONS IMPLICIT HERE, INCLUDING THAT IF THE POPULATION HAD BEEN LARGER THERE WOULD HAVE BEEN THE ASSOCIATED CAPITAL AND TECHNOLOGICAL INVESTMENT. MOREOVER WE HAVE ASSUMED THE SAME RATE OF UNEMPLOYMENT AMONG THE ADDITIONAL WORKERS AS THE POPULATION AS A WHOLE, AND THE SAME RATE OF AVERAGE PRODUCTIVITY. BOTH OF THESE ASSUMPTIONS MAY BE CONSERVATIVE, BECAUSE ADOLESCENT AND YOUNG ADULT WORKERS (WHO ARE NOT IN THIS GROUP) ARE MORE LIKELY TO BE UNEMPLOYED, AND HAVE LOWER PRODUCTIVITY WHEN THEY ARE EMPLOYED, THAN THE AVERAGE.

ESTIMATING THE PRODUCTION LOSSES FROM MORBIDITY ARISING FROM ALCOHOL-INDUCED DISEASE IS SOMEWHAT LESS STRAIGHT FORWARD. IT COVERS LOWER PRODUCTIVITY ON THE JOB FROM ILLNESS, AND HIGHER ABSENTEEISM.

SOME 3 PERCENT OF DRINKERS IN THE *DRINKING: PATTERNS AND PROBLEMS* SURVEY SAID THERE WERE HARMFUL EFFECTS OF THEIR OWN DRINKING ON WORK AND WORK OPPORTUNITIES. NO DOUBT A HIGHER PROPORTION OF THEIR COLLEAGUES AND EMPLOYERS WOULD MAKE THAT ASSESSMENT.⁴⁰

JANE CHETWYND AND TONY RAYNER CALCULATED A DIRECT LOSS OF PRODUCTION FROM UNEMPLOYMENT, REDUCED EFFICIENCY OF THOSE IN PAID EMPLOYMENT, AND TEMPORARY REMOVAL FROM THE WORK FORCE (BUT EXCLUDING THOSE FROM DEATHS AND MEDICAL COSTS) OF BETWEEN 1.7 PERCENT AND 2.5 PERCENT OF GDP. THEIR COUNTERFACTUAL SCENARIO INCLUDES FULL EMPLOYMENT, SO THAT A WORKER SUFFERING FROM ALCOHOL MISUSE CANNOT BE READILY REPLACED. THIS ASSUMPTION IS LESS PLAUSIBLE TODAY, SO WE TAKE THE LOWER BOUND OF THEIR ESTIMATE, WHICH IS EQUIVALENT TO A PRODUCTION LOSS OF \$1.2 BILLION IN 1990/1.⁴¹

THUS THE TOTAL PRODUCTION LOSS IS \$1.8 BILLION (2.5 PERCENT OF GDP), HAD THERE BEEN NO ALCOHOL MISUSE. NOTE THAT THE MEASURED PRODUCTION LOSS FROM ACTIVE MISUSERS IS ABOUT DOUBLE THAT OF THE LOSS FROM THE DEAD, AS A RESULT OF THE MISUSE.⁴²

4. RESOURCES DIVERTED FOR ALCOHOL CONSUMPTION.

⁴⁰ *op. cit.*, p.25.

⁴¹ J. CHETWYND & T. RAYNER, "THE ECONOMIC COSTS TO NEW ZEALAND OF LOST PRODUCTION DUE TO ALCOHOL ABUSE", *NZ Med J* (1985) vol 98, p.694-697.

⁴² L.J. BLUNT, N.J. DEVLIN & P.A. SCUFFHAM *The Social Costs of Alcohol Abuse in New Zealand*, Economics Department, University of Otago, 1996, estimate the production loss in the year to March 1991 as between \$1.2 billion and \$1.8 billion. However they use a different counterfactual (which is not precisely specified), which involves only the losses from death in 1990, and not in previous years. The future output from these deaths are discounted forward, but no allowance is made for future deaths which are avoided. Hence their figure for premature death is very much smaller than the figure estimated here.

An interesting innovation is they include the loss of production as a result of the incarceration of the potential workers, which they estimate as \$17m to \$27m, insufficient to change our order of magnitude. (Their estimates of the costs of administering the penal system are discussed below.)

IF THERE HAD BEEN NO DRINKING, THERE WOULD ALSO BE RESOURCES DIVERTED FROM ALCOHOL CONSUMPTION, WHICH COULD BE USED FOR SOME OTHER CONSUMPTION PURPOSES. THE ACTIVITIES WHICH USE THESE RESOURCES ARE:

- THOSE DIRECTLY USED FOR CONSUMPTION ASSOCIATED WITH ALCOHOL MISUSE;
- THOSE USED FOR HEALTH CARE TREATMENT AS A RESULT OF ALCOHOL-INDUCED ILLNESS;
- OTHER PUBLIC SECTOR EXPENDITURE AS A RESULT OF ALCOHOL MISUSE;
- THOSE USED TO REPLACE THE PHYSICAL LOSSES FROM MOTOR VEHICLE AND OTHER ACCIDENTS (THE HEALTH CARE COSTS HAVING BEEN COVERED IN THE PREVIOUS ITEM);
- THOSE USED AS A RESULT OF CRIMINAL ACTIVITY CAUSED BY ALCOHOL USE AND MISUSE;
- THOSE USED FOR CLEANING UP ANY LITTER FROM ALCOHOL USAGE.

THERE ARE NO ESTIMATES OF THE LATTER TWO EFFECTS.

DIRECT CONSUMPTION

THE RESOURCES DIVERTED FOR ALCOHOL CONSUMPTION ARE THE COST OF THE CONSUMPTION EXCLUDING EXCISE DUTY.⁴³ CONSUMPTION EXPENDITURE ON ALCOHOL PRODUCTS WAS ABOUT \$2.7 BILLION IN 1990/91. DEDUCTING EXCISE DUTY, THE VALUE OF THE RESOURCES USED IN THE PRODUCTION AND DISTRIBUTION OF ALCOHOL PRODUCTS AMOUNTS TO \$2.3 BILLION IN THAT YEAR.

SINCE WE HAVE ASSUMED ONLY A 40 PERCENT REDUCTION IN CONSUMPTION IN THE SCENARIO, THE ADDITIONAL RESOURCES RELEASED BY ELIMINATING MISUSE AMOUNTS TO \$900 MILLION FOR 1990/91.

HEALTH SECTOR EXPENDITURE

RAYNER AND CHETWYND ESTIMATED THAT 7.8 PERCENT OF HOSPITAL OPERATING COSTS WERE ATTRIBUTABLE TO ALCOHOL CONSUMPTION IN 1981/2.⁴⁴ IF WE APPLY THIS PROPORTION

⁴³ GST IS INCLUDED, SINCE IT IS IMPOSED ON (JUST ABOUT) ALL RESOURCE USAGE, THE RESOURCES USED IN THE COUNTERFACTUAL SCENARIO WOULD HAVE GST IMPOSED UPON THEM, AND THE COMPARISON IS MADE WITH GDP MEASURED TO INCLUDE GST.

⁴⁴ T. RAYNER & J. CHETWYND "THE ECONOMIC COST OF ALCOHOL-RELATED HEALTH CARE IN NEW ZEALAND". *British Journal of Addiction*, (1987) 82, p.59-66.

An earlier estimate whose upper bound is a similar order of magnitude is T. Ashton and S. Casswell "Estimated Cost of Alcohol to the New Zealand Public Hospital System" , *NZ Med J*, (1984) vol 97, p.683-686.

TO ALL HEALTH EXPENDITURE, INCLUDING TO NON-HOSPITAL COSTS WE OBTAIN AN ESTIMATE OF \$410 MILLION FOR THE 1990 YEAR.⁴⁵

⁴⁵ BLUNT, DEVLIN, AND SCUFFHAM *op. cit.* estimate hospital costs at \$73m in 1990/1. This is only one-sixth of the Chetwynd & Rayner estimate, and would imply that only 2.5 percent of total hospital costs were attributable to alcohol abuse. It is not possible to derive from their report why there is this massive difference, and it is not commented on. Medical professionals have expressed surprise at this low proportion. At this stage it seems safer to use the Chetwynd and Rayner estimate, but concede it may be too high.

OTHER PUBLIC SECTOR SPENDING

VARIOUS OTHER GOVERNMENT DEPARTMENTS ARE INVOLVED IN ADDITIONAL EXPENDITURE FROM ALCOHOL MISUSE. THESE INCLUDE THE ACCIDENT COMPENSATION CORPORATION, THE JUSTICE DEPARTMENT, THE POLICE, THE MINISTRY OF TRANSPORT, PLUS THE ADMINISTRATION THAT IS NECESSARY TO THOSE DEPARTMENTS (E.G. STATE SERVICES COMMISSION AND THE TREASURY). THERE IS NO PLAUSIBLE ESTIMATE FOR THESE ESTIMATES,⁴⁶ SO AN EXPENDITURE FIGURE OF \$200 MILLION IS INCLUDED AS AN ORDER OF MAGNITUDE.

OTHER ROAD ACCIDENT COSTS

THERE DOES NOT SEEM TO BE ANY SUITABLE ESTIMATE OF THE COSTS FROM ROAD ACCIDENTS (OR SIMILAR SORTS OF INCIDENTS, SUCH AS BOATING ACCIDENTS) IN NEW ZEALAND. MANY OF THOSE COSTS ARE INCLUDED ELSEWHERE, SUCH AS IN MORTALITY AND MORBIDITY COSTS, AND HOSPITAL COSTS.⁴⁷ COLLINS AND LAPSLEY ESTIMATE THAT THE REMAINING COSTS (VEHICLE DAMAGE, INSURANCE ADMINISTRATION, ACCIDENT INVESTIGATION, VEHICLE DELAY AND AMBULANCE AND RESCUE SERVICES) TO BE 0.2 PERCENT OF AUSTRALIA'S GDP. A COMPARABLE NEW ZEALAND FIGURE WOULD BE \$140 MILLION IN 1990.

5. THE BENEFITS OF CONSUMPTION ASSOCIATED WITH ALCOHOL MISUSE

ALCOHOL CONSUMPTION, EVEN THAT WHICH INVOLVES MISUSE, MAY - OR MAY NOT - GIVE THE CONSUMERS SOME DIRECT BENEFIT. INsofar AS THERE IS A BENEFIT, WHICH WOULD BE LOST UNDER THE COUNTERFACTUAL SCENARIO OF THE ELIMINATION OF MISUSE, THAT BENEFIT MUST BE DEDUCTED FROM THE GAINS ESTIMATED ABOVE.

⁴⁶ BLUNT, DEVLIN, & SCUFFHAM *op. cit.* estimate the costs incurred by the Accident Compensation as \$36m in 1990/1, of the Justice Department between \$99.1m and \$218.8m, (between 16 percent and 35 percent of total spending), of the Police between \$212.7 and \$498.6m (34 percent and 93 percent of total spending), and Ministry of Transport at \$10.6m, a total of between \$358.8m and \$764.3m. No working definition is given, and in some cases the figures seem far too high. I have used a figure close to their lowest estimate.

⁴⁷ THE COST FROM MORBIDITY IDENTIFIED IN *The Role of Alcohol in Road Crashes*, report prepared for ALAC by a taskforce of the Officials Committee on Road Safety, September 1995, is included in our total morbidity figure.

NORMALLY AN ECONOMIST VALUES THE BENEFITS OF THE CONSUMPTION OF ANY GOODS AND SERVICES IN TERMS OF THE COST OF THE OUTLAYS FOR THEM, ALTHOUGH A MORE SOPHISTICATED ANALYSIS WOULD ALSO INCLUDE AN ESTIMATE OF THE CONSUMER SURPLUS, DEFINED AS THE ADDITIONAL BENEFIT (UTILITY) WHICH THE CONSUMER GETS ABOVE THAT WHICH IS PAID. HOWEVER THIS ADJUSTMENT WOULD HAVE TO BE MADE TO EVERY ITEM AND NOT JUST TO THE SPECIFIC CONSUMPTION, SO FOR CONSISTENCY WE KEEP TO THE MORE ORTHODOX MEASURE.

IN ANY CASE IT CAN BE ARGUED THAT THIS MEASURE IS INAPPROPRIATE BECAUSE ALCOHOL CONSUMPTION CAN BE ADDICTIVE. THE ARGUMENT IS SET OUT IN APPENDIX 3 BUT, BRIEFLY, PEOPLE ARE ADDICTED IF THEY WOULD LIKE TO GIVE UP (OR CUT DOWN) BUT ARE UNABLE TO DO SO. THEIR PERSONAL COUNTERFACTUAL IS THAT IF THEY HAD NOT EXCEEDED "SAFE" LEVELS OF DRINKING THEY WOULD BE BETTER OFF. THAT TRANSLATES INTO A COUNTERFACTUAL SCENARIO THAT THEY OBTAIN NO BENEFIT FROM THEIR EXCESSIVE DRINKING.

COLLINS AND LAPSLEY ASSUME THAT 20 PERCENT OF ALL ALCOHOL CONSUMPTION AS BEING ADDICTIVE.⁴⁸ THIS STUDY USES THEIR PROPORTION, TAKING THAT ONE-FIFTH OF ALL ALCOHOL CONSUMPTION GIVES NO BENEFIT TO THE CONSUMER. SUPPOSE WE ASSUME IN THE COUNTERFACTUAL SCENARIO THAT THERE IS A 40 PERCENT REDUCTION IN CONSUMPTION. ONE-HALF OF THIS IS ADDICTIVE, AND SO NON-BENEFICIAL, WHILE THE OTHER HALF (WHICH IS ALSO ELIMINATED) IS NEVERTHELESS DEEMED BY THE DRINKERS TO BE BENEFICIAL. THAT AMOUNTS TO \$540 MILLION IN THE 1990 YEAR.⁴⁹

6. THE SOCIAL COSTS OF ALCOHOL MISUSE

⁴⁸ *op. cit.*, p.23.

⁴⁹ NOTE THIS IS MEASURED AT MARKET PRICES, RATHER THAN FACTOR COSTS, BECAUSE THE MARKET PRICE REFLECTS THE WILLINGNESS-TO-PAY, AND HENCE THE UTILITY/BENEFIT EXPERIENCED.

SOCIAL COSTS OF ALCOHOL MISUSE
Measured Relative to Stated Counterfactual Scenario
 (1990)

	\$m
<i>Intangible</i>	
Effect of population mortality	6,000
Effect of population morbidity	7,200
<i>Tangible</i>	
Reduced production from mortality	600
Reduced production from morbidity	1,200
Additional resources from not consuming alcohol	900
Additional resources from not have to treating alcohol induced diseases and other consequences	750
<u>Less</u>	
Benefits from reduced alcohol consumption	-540
 TOTAL COSTS FROM ALCOHOL MISUSE	 16,110
 <i>Intangible Costs</i>	
Total	13,200
Percentage of total human capital	2.0%
 <i>Tangible Costs</i>	
Total	2,910
Percentage of GDP	4.0%
 <i>Population Decrease</i>	 0.8%

AS SUMMARIZED IN TABLE 3.1, THE SOCIAL COSTS OF ALCOHOL MISUSE AMOUNT TO ABOUT \$16.1 BILLION FOR THE 1990 YEAR. THIS ESTIMATE IS SUBJECT TO A VARIETY OF MEASUREMENT PROBLEMS AS DISCUSSED IN THE TEXT, MOST OF WHICH TEND TO MAKE THE FIGURE CONSERVATIVE.

IT IS NOT STRICTLY CORRECT TO COMPARE THIS FIGURE TO THE NEW ZEALAND GDP OF \$73 BILLION IN 1990/91. BY FAR THE BIGGEST COMPONENT OF THE COST IS THE INTANGIBLE ELEMENT (OF \$13.2 BILLION), WHICH SHOULD BE COMPARED WITH THE TOTAL VALUE OF LIFE YEARS FOR THE POPULATION (OF ABOUT \$670 BILLION). THE \$13.2 BILLION REPRESENTS A LOSS OF 2.0 PERCENT OF THOSE LIFE YEARS AS A RESULT OF THE MORTALITY AND MORBIDITY EFFECTS OF ALCOHOL-INDUCED DISEASES. THE TANGIBLE ELEMENT OF THE COSTS COMES TO A NET \$2.9 BILLION (4.0 PERCENT OF GDP).⁵⁰

⁵⁰ GIVEN THE LOSSES FROM MARKET PRODUCTION ARE AROUND 2.5 PERCENT OF GDP, WE MIGHT ASSUME THAT, UNTIL THERE IS A DIRECT ESTIMATE, THE COMPARABLE LOSS TO NON-

MARKET PRODUCTION (E.G. CHILDCARE, HOUSEWORK) WOULD ALSO BE ABOUT 2.5 PERCENT OF THE TOTAL VALUE OF NON-MARKET PRODUCTION.

WHILE THE POPULATION IS 0.8 PERCENT LARGER UNDER THE COUNTERFACTUAL SCENARIO OF NO ALCOHOL CONSUMPTION, THE ADDITIONAL RESOURCES AVAILABLE INCREASE GDP BY 4.0 PERCENT. THUS THE ABOLITION OF ALCOHOL MISUSE WOULD INCREASE PER CAPITA GDP (AND THERE WOULD BE INTANGIBLE GAINS AS WELL).

CONCLUSION

THE CURRENT BEST ESTIMATE FOR THE ECONOMIC AND SOCIAL COSTS OF ALCOHOL USAGE IS OVER \$15 BILLION FOR THE 1990 YEAR, EQUIVALENT TO 4.0 PERCENT OF GDP, AND 2 PERCENT OF QUALITY-ADJUSTED LIFE YEARS. IT IS THESE MORTALITY AND MORBIDITY EFFECTS WHICH DOMINATE THE VALUATION JUST AS THEY DOMINATE OUR THINKING ABOUT AVOIDING THE CONSEQUENCES OF ALCOHOL MISUSE. HOWEVER, MUCH MORE SO THAN IN THE CASE OF TOBACCO, THE COSTS OF ALCOHOL MISUSE ALSO DAMAGE THE MATERIAL WELFARE OF THE NATION BY REDUCING ITS PRODUCTIVE CAPACITY, AND DIVERTING RESOURCES TO REMEDY THE MISUSE.

CHAPTER 4:

CONCLUSION: COMPARING THE SOCIAL COSTS OF TOBACCO USE AND ALCOHOL MISUSE

INTRODUCTION

TABLE 4.1 COMBINES TABLES 2.1 AND 3.1. IT WOULD SEEM THE SOCIAL COSTS OF TOBACCO ABUSE EXCEEDED THE COSTS OF ALCOHOL ABUSE IN 1990, ALTHOUGH THE COSTS APPEAR TO BE OF A SIMILAR ORDER OF MAGNITUDE. NOTE THAT NOT ONLY ARE THE ASSUMPTIONS IMPORTANT IN INTERPRETING THIS COMPARISON, BUT ALSO THAT THE COUNTERFACTUALS ARE DIFFERENT. THE CONTRAST IS TOBACCO *USE* AGAINST ALCOHOL *MISUSE*.

THE BIGGEST DIFFERENCE BETWEEN THE TWO IS THE EFFECT OF POPULATION MORTALITY,

SUMMARY TABLE
SOCIAL COSTS of TOBACCO USE & ALCOHOL MISUSE
Measured Relative to Stated Counterfactual Scenarios
(1990)

	<u>Tobacco</u>	<u>Alcohol</u>
	\$m	\$m
<i>Intangible</i>		
Effect of population mortality	14,000	6,000
Effect of population morbidity	7,250	7,200
<i>Tangible</i>		
Reduced production from mortality	400	600
Reduced production from morbidity	145	1,200
Additional resources from consumption	580	900
Additional resources from not have to treating induced diseases and other consequences	205	750
<u>Less</u>		
Benefits from consumption	-125	-540
TOTAL COSTS FROM ABUSE	22,470	16,110
<i>Intangible Costs</i>		
Total	21,250	13,200
Percentage of total human capital	3.2%	2.0%
<i>Tangible Costs</i>		
Total	1,220	2,910
Percentage of GDP	1.7%	4.0%
<i>Population Decrease</i>		
2.0%	0.8%	

WHERE TOBACCO COSTS ARE MORE THAN DOUBLE ALCOHOL COSTS. THAT THIS IS A LOWER RATIO THAN THE RATIO OF DEATHS ATTRIBUTABLE TO TOBACCO AND ALCOHOL, IS BECAUSE VICTIMS OF ALCOHOL MISUSE DIE YOUNGER, SO THAT THERE IS A GREATER LOSS OF LIFE YEARS AS A RESULT.

ON THE OTHER HAND THE EFFECTS OF MORBIDITY FROM ALCOHOL MISUSE AND TOBACCO USE APPEAR TO BE MUCH THE SAME. THESE ARE THE MOST CONJECTURAL ESTIMATES, BUT IT IS CLEAR THAT MORBIDITY COSTS ARE LARGE, AND MAY WELL BE OF A SIMILAR ORDER OF MAGNITUDE FOR THE TWO FORMS OF ABUSE.

THE TANGIBLE COSTS FOR ALCOHOL MISUSE ARE MORE THAN DOUBLE THOSE FOR TOBACCO USE. WHILE SUBJECT TO ERROR, THE BROAD RELATIVITY IS PROBABLY CORRECT. ALCOHOL HAS A FAR MORE PERVASIVE IMPACT ON GDP.

THE IMPACT ON THE FISCAL POSITION

THE INTERNATIONAL GUIDELINES RECOMMEND THAT COSTS BE ALLOCATED BETWEEN VARIOUS SECTORS SUCH AS THE USERS, THEIR FAMILIES, HOUSEHOLDS OF NON-ABUSERS, FIRMS, AND THE GOVERNMENT. THERE IS NOT ENOUGH INFORMATION TO DO THIS ACROSS THE BOARD. FOR INSTANCE, HOW DO WE ALLOCATE THE LOSS FROM THE REDUCED PRODUCTION AS A RESULT OF MORBIDITY BETWEEN THE INDIVIDUAL (WHO MAY BE PAID LOWER WAGES BECAUSE OF A POORER WORK RECORD FROM DRUG ABUSE), ALL WORKERS (WHO IF BEING PAID ON AN AVERAGE PRODUCTIVITY BASIS WILL SUFFER IF SOME WORKERS HAVE LOWER PRODUCTIVITY FROM DRUG ABUSE), THE FIRM (IF THE POORER PRODUCTIVITY OF DRUG ABUSERS REDUCES PROFITS), AND THE GOVERNMENT (WHICH WILL SUFFER FROM A LOWER TAX TAKE)? ALLOCATING INTANGIBLE COSTS IS EVEN MORE PROBLEMATIC, SINCE IT IS NOT OBVIOUS HOW TO ALLOCATE THE COSTS OF A DEATH BETWEEN THE INDIVIDUAL, THE FAMILY, AND THE COMMUNITY AT LARGE - THE GOVERNMENT AND FIRMS RARELY CARRY THIS BURDEN DIRECTLY.

HOWEVER WE CAN ESTIMATE THE GOVERNMENT'S SHARE OF THE TANGIBLE COSTS BY ATTRIBUTING A LOSS OF GOVERNMENT TAX REVENUE OR AN INCREASE IN GOVERNMENT SPENDING ON AN ITEM BY ITEM BASIS. TABLE 4.2 SHOWS THESE ESTIMATES, TOGETHER WITH THE GOVERNMENT EXCISE DUTY FOR COMPARISON.⁵¹

⁵¹ OTHER TAXES COLLECTED (SUCH AS GST AND INCOME TAX) ON THE DRUG CONSUMPTION ARE NOT RELEVANT, BECAUSE THEY WOULD ALSO BE COLLECTED IN THE COUNTERFACTUAL SCENARIO ON THE OTHER PRODUCTION AND CONSUMPTION.

IT WOULD APPEAR THAT IN 1990 THE GOVERNMENT EXCISE DUTY FROM TOBACCO MORE THAN

**TABLE 4.2
GOVERNMENT COSTS OF
TOBACCO USE AND ALCOHOL MISUSE
(1990)**

	<u>Tobacco</u> \$m	<u>Alcohol</u> \$m
Reduced taxation from mortality	160	240
Reduced taxation from morbidity	60	480
Additional resources from not have to treating induced diseases and other consequences	180	530
<u>Less</u>		
Excise duties (including GST)	560	-535
TOTAL COSTS TO GOVERNMENT	160	715
Percentage of total government revenue	0.6%	2.7%

COVERED THE LOSS OF REVENUE AND THE REDUCTION OF EXPENDITURE, HAD THERE BEEN NO TOBACCO CONSUMPTION. IN THE CASE OF ALCOHOL, GOVERNMENT REVENUE LOSSES AND ADDITIONAL SPENDING FROM ELIMINATING MISUSE FAR EXCEEDED THE RECEIPTS FROM THE EXCISE DUTY ON ALCOHOL.⁵²

THESE CALCULATIONS DO NOT ALLOW FOR THE ADDITIONAL SPENDING THAT THE LARGER POPULATIONS WOULD HAVE GENERATED. THE FISCAL IMPACT WOULD BE EVEN MORE NEGATIVE UNDER THE TOBACCO COUNTERFACTUAL SCENARIO (ESPECIALLY AS THE COUNTERFACTUAL POPULATION IS OLDER WITH SUBSTANTIAL HEALTH AND SUPERANNUATION ENTITLEMENTS). BUT THE FISCAL POSITION WOULD LIKELY STILL BE FAVOURABLY IMPROVED BY A "NO ALCOHOL MISUSE" SCENARIO (SINCE THERE ARE SUBSTANTIAL LOSSES OF PEOPLE IN THE WORKING AGE WHO ARE NOT MAKING MAJOR FISCAL DEMANDS).⁵³

⁵² THE SUM FOR EXCISE DUTY ON ALCOHOL IS THE TOTAL AND NOT JUST THAT GENERATED BY THE ALCOHOL MISUSE. THE COUNTERFACTUAL IS THAT IF THERE WAS NO MISUSE, ANY EXCISE DUTY COULD NOT BE JUSTIFIED, AND THEREFORE ABOLISHED.

⁵³ THE IMPACTS OF DIFFERENT GENERATIONS ON THE FISCAL POSITION CAN BE SEEN FROM *The Fiscal Impact on Income Distribution 1987/88*, Department of Statistics (1990).

POLICY IMPLICATIONS

THERE IS ONE UNCONTROVERSIAL, YET OVERWHELMING, POLICY CONCLUSION. THE STUDY CONFIRMS THAT THE ABUSE OF TOBACCO AND ALCOHOL HAVE MAJOR ECONOMIC CONSEQUENCES, BOTH IN THE IMPACT ON TANGIBLES, AND ON INTANGIBLES. IT IS CLEARLY IN THE INTERESTS OF PUBLIC WELFARE TO REDUCE THAT ABUSE - TO REDUCE THE USE OF TOBACCO, AND THE MISUSE OF ALCOHOL.

AN INTERESTING IMPLICATION IS THAT GIVEN THE ORDERS OF THE MAGNITUDES OF THE TWO ESTIMATES ARE MUCH THE SAME, ONE MIGHT ASK WHETHER THERE HAS BEEN AN OVEREMPHASIS ON THE TOBACCO ISSUE RELATIVE TO THE ALCOHOL ONE. ANY ANSWER WOULD HAVE TO INCLUDE THAT THE TOBACCO USE PROBLEM IS A SOMEWHAT EASIER ONE TO DEAL WITH THAN THE ALCOHOL MISUSE PROBLEM, BECAUSE MANY ALCOHOL POLICY INSTRUMENTS IMPACT ON ALL CONSUMPTION: MISUSE, BENIGN, AND BENEFICIAL. ONE MIGHT TENTATIVELY CONCLUDE THAT IT WAS RIGHT, INITIALLY, TO PUT THE EMPHASIS ON REDUCING AND EVEN ELIMINATING TOBACCO CONSUMPTION. AN IMPORTANT ISSUE THIS STUDY RAISES IS WHETHER WE HAVE REACHED THE STAGE OF NEEDING TO PUT MORE EMPHASIS ON REDUCING AND ELIMINATING ALCOHOL MISUSE. HOWEVER THE KEY COMPARISON MAY NOT BE SO MUCH BETWEEN ALCOHOL AND TOBACCO, BUT THE EXTENT TO WHICH THE ALCOHOL MISUSE PROBLEM SHOULD BE PURSUED RELATIVE TO OTHER PUBLIC AND PRIVATE HEALTH PREVENTION PROGRAMS.

THE FISCAL IMPACT SECTION RAISES THE QUESTION OF TAX POLICY. THIS IS A COMPLEX AREA, AND IT WOULD BE WRONG TO USE THE STUDY TO JUMP TO ANY CONCLUSIONS. IT DOES NOT FOLLOW THAT THE LEVEL OF EXCISE DUTY SHOULD JUST COVER THE COST TO THE GOVERNMENT OF THE MISUSE. FIRST, THIS IMPLIES EQUATING THE EXCISE DUTY RATE TO THE AVERAGE GOVERNMENT COST, WHEREAS IT IS CLEAR THAT THE OPTIMAL TAXATION SHOULD EQUATE THE EXCISE DUTY RATE TO SOME NOTION OF A MARGINAL COST TO THE GOVERNMENT.⁵⁴ SECOND, THE RELEVANT SOCIAL COSTS ARE NOT JUST COSTS TO THE GOVERNMENT, BUT INCLUDE THE COSTS TO THE WIDER COMMUNITY - ESPECIALLY THOSE WHICH THE MISUSER DOES NOT TAKE INTO ACCOUNT.⁵⁵

⁵⁴ SEE FOR INSTANCE B.H. EASTON, *Taxing Alcohol: The Mathematics*, Paper 94.19, Economic And Social Trust On New Zealand.

⁵⁵ BECAUSE THE STUDY HAS BEEN CONCERNED WITH THE SCIENTIFIC QUESTION OF WHAT ARE THE COSTS TO SOCIETY, THE RESEARCHER HAS NOT TURNED HIS MIND TO THE POLICY QUESTION OF THE EXTENT TO WHICH THE INTANGIBLE COSTS TO SOCIETY SHOULD BE INCLUDED IN THE SOCIAL COST RELEVANT FOR SETTING THE EXCISE DUTY RATE.

THERE IS PERHAPS ONE POLICY RESULT WHICH DOES, HOWEVER, STRONGLY COME OUT OF THE FISCAL IMPACT SECTION. THE GOVERNMENT CERTAINLY HAS A STRONG INCENTIVE, IN TERMS OF ITS OWN FISCAL POSITION, TO MINIMIZE ALCOHOL MISUSE. IN DOING SO IT SHOULD BE NOTED THAT THE UNAVOIDABLE COST - FUTURE COSTS CONSEQUENT ON PAST ALCOHOL MISUSE - ARE LIKELY TO CONTINUE FOR SOME DECADES.

ONE FURTHER, AND PERHAPS RELATIVELY NEW, POLICY ISSUE ARISES OUT OF THIS STUDY. THE MORBIDITY COSTS FROM BOTH SORTS OF ABUSE APPEAR SUBSTANTIAL. PERHAPS POLICY SHOULD FOCUS MORE ON REDUCING THESE COSTS THAN HAS BEEN EMPHASIZED IN THE PAST.

RESEARCH DIRECTIONS

AS EXPLAINED IN THE INTRODUCTION, THIS WAS A LIMITED STUDY OF THE SOCIAL COSTS OF TOBACCO USE AND ALCOHOL MISUSE. AMONG THE LIMITATIONS ARE:

- WHEREVER POSSIBLE IT HAS USED EXISTING COST STUDIES, RATHER THAN CARRY OUT ORIGINAL ONES, BUT IT HAS NOT BEEN POSSIBLE TO VERIFY EVERY PREVIOUS STUDY;
- THERE ARE SOME OMISSIONS;
- IN EACH CASE ONLY ONE COUNTERFACTUAL SCENARIO HAS BEEN EXPLORED, WHICH HAS MEANT IT HAS NOT BEEN POSSIBLE TO DISTINGUISH AVOIDABLE FROM UNAVOIDABLE COSTS;
- IT HAS NOT BEEN POSSIBLE TO EXPLORE INCIDENCE BETWEEN INDIVIDUALS, THEIR FAMILIES, HOUSEHOLDS OF NON-ABUSERS, FIRMS AND THE GOVERNMENT, AND ALSO BY GENDER, ETHNICITY, AND AGE;
- OTHER DRUG ABUSE, INCLUDING ILLICIT DRUGS AND ABUSE OF PRESCRIPTION DRUGS, HAVE NOT BEEN INCLUDED (ALTHOUGH IT SEEMS LIKELY THEY WILL BE A MUCH SMALLER COST THAN THE TWO CONSIDERED HERE).⁵⁶

IN ADDITION, THERE IS A FASCINATING FUTURE PROJECT TO INCORPORATE THE SOCIAL COSTS OF DRUG ABUSE INTO THE NATIONAL ACCOUNTS FRAMEWORK, USING THE NEW SNA SATELLITE ACCOUNTING PROCEDURES. SUCH A DEVELOPMENT IS LIKELY TO LEAD TO A GENERAL COST-OF-ILLNESS FRAMEWORK, AND ALSO TO INTEGRATE TO A FAR GREATER DEGREE THE MATERIAL PRODUCTION SECTOR WITH THE HUMAN CAPITAL SECTOR OF A

⁵⁶ D. COLLINS & H. LAPSLEY, IN THEIR *The Social Costs of Drug Abuse in Australia in 1988 and 1992*, (Commonwealth Department of Human Services and Health, 1996) estimate that tobacco and alcohol costs generate around 90 percent of all social costs, although they use different counterfactual.

NATION'S ACTIVITY - ULTIMATELY LEADING TO BETTER INTEGRATED HEALTH AND EDUCATION POLICIES.

EACH OF THE ABOVE POINTS WAS BROADLY UNDERSTOOD BEFORE THE PROJECT COMMENCED, ALTHOUGH AS A RESULT OF THE PROJECT WE HAVE A BETTER UNDERSTANDING OF THEIR DETAILS, AS WELL AS THE MAGNITUDES INVOLVED. HOWEVER THERE IS ONE NEW RESULT, WHICH SURPRISED THIS RESEARCHER.

THE FATAL CONSEQUENCES OF DRUG ABUSE ARE WELL KNOWN AND DOCUMENTED (ALTHOUGH, PERHAPS PREVIOUSLY, WE HAD NOT BEEN QUITE AS CONSCIOUS OF THE IMPLICATIONS OF THE EARLIER PATTERN OF DEATHS FROM ALCOHOL). HOWEVER THE MORBIDITY CONSEQUENCES WERE NOT SO WELL APPRECIATED. THIS STUDY HAS SUGGESTED THAT WHILE IN THE CASE OF TOBACCO USE THE MORBIDITY COSTS ARE ABOUT ONE-HALF OF THE MORTALITY COSTS, IN THE CASE OF ALCOHOL MISUSE THE MORBIDITY COSTS APPEAR TO BE SIMILAR IN MAGNITUDE TO THE TOBACCO ONES. IN EACH CASE THE COSTS APPEAR TO BE VERY LARGE. YET WE KNOW VERY LITTLE ABOUT THESE MORBIDITY ISSUES. THE COLLINS AND LAPSLEY AUSTRALIAN STUDIES,⁵⁷ OF WHICH WE HAVE HAD OCCASION TO CITE ELSEWHERE IN THIS STUDY, USE THE ACRONYM "SNQ" - SIGNIFICANT, NOT QUANTIFIED. THIS STUDY SUGGESTS THAT MORBIDITY COSTS ARE NOW "VSPQ" -VERY SIGNIFICANT, POORLY QUANTIFIED. IF THE MORBIDITY PARAMETERS ARE GUESTIMATES - THE LEAST RELIABLE OF ALL THOSE PRESENTED HERE - THEY ARE ALSO THOSE FOR WHICH THERE IS THE HIGHEST RESEARCH PRIORITY FOR IMPROVING THEIR PRECISION, BY BETTER UNDERSTANDING THE PHENOMENON THEY REFLECT.

MORE GENERALLY THIS STUDY CONCLUDES FROM THE NEW ZEALAND WORK CARRIED OUT THUS FAR, THAT:

THE SOCIAL COSTS OF TOBACCO MISUSE AND TOBACCO ABUSE ARE VSSQ - VERY SIGNIFICANT, SOME QUANTIFICATION.

⁵⁷ *op. cit.*

APPENDIX 1: THE VALUE OF LIFE

THE ISSUE OF THE VALUE OF LIFE IS NOT AN EASY ONE. SOME CULTURES AND SOME RELIGIONS WOULD NOT CONTEMPLATE PUTTING A MONETARY VALUE ON LIFE. IT IS NOT CLEAR THAT ALL LIFE SHOULD BE TREATED EQUALLY: ESPECIALLY PERTINENT IN THE CONTEXT OF SUBSTANCE ABUSE WAS WHETHER TO GIVE THE LIFE OF AN ALCOHOLIC IN HER OR HIS TERMINAL STAGES HAVING THE SAME VALUE AS THAT OF GOOD CITIZEN WHO WAS MURDERED IN THE COURSE OF THE ALCOHOLIC PURSUING THEIR HABIT. IN ANY CASE, WHAT RIGHT HAVE ECONOMISTS TO VALUE LIFE?

WHEN IT COMES TO POLICY ADVICE, AN ECONOMIST CANNOT ALWAYS AVOID PUTTING SOME VALUE ON LIFE. CONSIDER THE QUESTION OF WHETHER TO INSTALL TRAFFIC LIGHTS AT AN INTERSECTION, WHERE ONE EFFECT WOULD BE TO REDUCE ACCIDENTS WHICH LEAD TO DEATHS. IF THE EVALUATION IGNORED LIVES SAVED BY THE LIGHTS, THAT WOULD BE EQUIVALENT TO TREATING THE VALUE OF LIFE AS ZERO. AS A RESULT SOME LIFE SAVING TRAFFIC SYSTEMS WOULD NOT BE RECOMMENDED. ON THE OTHER HAND IF THE VALUE OF LIFE WAS SET AS INFINITY, EVERY TRAFFIC SYSTEM WHICH REDUCED THE PROBABILITY OF DEATH - NO MATTER HOW SMALL THAT PROBABILITY - WOULD BE INSTALLED, WITH THE RESULT THAT WE COULD BARELY MOVES GIVEN THE DENSITY OF LIFE SAVING TRAFFIC SYSTEMS. SO IN PRACTICE SOCIETY INCORPORATES THE VALUE OF LIVES SAVED WHEN IT MAKES POLICY DECISIONS. ALL ECONOMISTS ARE DOING EXPLICITLY, IS WHAT OTHERS POLICY ADVISERS AND MAKERS DO.

NOW THE SNA FRAMEWORK FOR COI CAN AVOID THE ISSUE, BECAUSE IT IS NOT STRICTLY OFFERING POLICY ADVICE. AVOIDANCE WOULD NOT BE BY IGNORING THE ISSUE, FOR THAT WOULD BE EQUIVALENT TO SETTING THE VALUE OF LIFE AT ZERO. RATHER THE RESULT MIGHT BE REPORTED THAT THE ANNUAL COST OF A PARTICULAR ILLNESS WAS \$100 MILLION PLUS 10,000 QUALITY ADJUSTED LIFE YEARS SAVED. THAT MEANING WOULD BE THAT UNDER THE COUNTERFACTUAL SCENARIO, THERE WOULD BE \$100 MILLION OF EXTRA RESOURCES FOR CONSUMPTION, AND 10,000 ADDITIONAL QALYs.

HOWEVER THE COST OF ANOTHER ILLNESS MIGHT BE \$50 MILLION PLUS 20,000 QALYs. SOME MAY WONDER WHICH ILLNESS IS THE MORE DETRIMENTAL: A QUESTION THAT CAN ONLY BE ANSWERED BY COMBINING THE DOLLARS WITH THE QALYs IN SOME WAY. WHATEVER WAY WOULD BE EQUIVALENT TO PUTTING A VALUE ON LIFE.

PRESSED BETWEEN THE ECONOMIC AND POLICY LOGIC, AND CULTURAL AND RELIGIOUS SENSITIVITIES, AN ECONOMIST DOES NOT RESOLVE THE QUESTION OF THE TREATMENT OF THE VALUATION OF LIFE. INSTEAD WE USE A DELIBERATELY CLUMSY TERM SUCH AS THE *SOCIAL*

GAINS FROM ADDITIONAL (QUALITY ADJUSTED) LIFE YEARS. THE TERM "SOCIAL" IS TO EMPHASIZE THE NOTION IS NOT INTENDED TO HAVE A RELIGIOUS MEANING, BUT TO REFLECT THAT SOCIETY MAY (OR MAY NOT) WISH TO VALUE ANY IMPROVEMENTS IN THE QUALITY OF LIFE AS A RESULT OF REDUCTION IN SUBSTANCE ABUSE. THIS IS PUTTING THE MATTER INTO A TEMPORARY LIMBO, RATHER THAN ULTIMATELY RESOLVING THE PHILOSOPHICAL ISSUE. THAT WILL DEPEND UPON A WIDER RANGE OF PROFESSIONS. AFTER THAT RESOLUTION ECONOMISTS CAN TURN TO THE QUESTION OF THE BEST VALUATION METHOD, IF ANY.

THE QUESTION OF VALUING THE LIFE OF THE ALCOHOLIC, COMPARED WITH VALUING THE LIFE OF THE GOOD CITIZEN, MAY TURN OUT TO BE TRIVIAL, PROVIDING THE COUNTERFACTUAL IS KEPT IN MIND. SUPPOSE THE COUNTERFACTUAL SCENARIO INVOLVES THE ELIMINATION OF SUBSTANCE ABUSE. THEN THE COUNTERFACTUAL SCENARIO HAS THE ALCOHOLIC AS A GOOD CITIZEN, AND HER OR HIS DEATH IS JUST AS GREAT A LOSS TO SOCIETY. ALTERNATIVELY ONE MIGHT WANT TO SAY THE LOSS OF THE ALCOHOLIC'S LIFE IS MUCH LESS VALUABLE THAN THAT OF THE GOOD CITIZEN, BECAUSE THE QUALITY OF LIFE IS LOWER. BUT, IN ADDITION, THE COUNTERFACTUAL SCENARIO IS ABOUT THE RECOVERY OF THAT LOW QUALITY LIFE TO A "STANDARD" LIFE. THUS THE TOTAL VALUATION, SUMMING THE TWO COMPONENTS, WILL BE THE SAME AS THE LOSS OF THE GOOD CITIZEN'S LIFE. THE COI INCLUDES THE VALUE OF THE EXISTING DAMAGE TO THE LIFE OF AN ADDICT, AS WELL AS MORTALITY EFFECTS.

APPENDIX 2: THE VALUE OF LIFE IN NEW ZEALAND

THERE APPEARS TO BE ONLY ONE NEW ZEALAND AGENCY WHICH HAS SYSTEMATICALLY ATTEMPTED TO PUT A VALUE ON SAVING A LIFE. IT DID THIS USING THE "WILLINGNESS-TO-PAY" METHOD. IN 1990 THE LAND TRANSPORT SAFETY AUTHORITY ASKED A SAMPLE OF NEW ZEALANDERS HOW MUCH, IN RESOURCE TERMS, THEY WERE WILLING TO FORGO IN ORDER TO AVOID ONE DEATH. BASED ON THE FINDINGS OF THE STUDY, THE MINISTER OF TRANSPORT DECIDED THAT THE VALUE OF STATISTICAL LIFE SHOULD BE \$2 MILLION (AT 1 APRIL 1990 PRICES) FOR ALL EVALUATIONS INVOLVING TRANSPORT PROJECTS.⁵⁸ NOTE THAT A ROAD SAFETY PROGRAM WHICH REDUCES DEATHS FROM DRUNKEN DRIVING, VALUES EACH LIFE SAVED AT \$2 MILLION.

WHAT, HOWEVER, WE NEED IS A MEASURE OF THE VALUE OF LIFE YEARS SAVED, RATHER THAN THE VALUE OF DEATH. THIS DISTINCTION IS IMPORTANT, BECAUSE IT ALLOWS DISTINGUISHING THE EARLY DEATH OF A YOUNG PERSON IN AN ALCOHOL-INDUCED ROAD ACCIDENT, WHO MIGHT HAVE EXPECTED TO LIVE FOR MANY MORE YEARS, WITH THAT OF AN ELDERLY PERSON, WHOSE DEATH FROM A TOBACCO-INDUCED DISEASE SHORTENS THEIR LIFE BY, SAY, A COUPLE OF YEARS. A CAPITALIZED SUM OF \$2 MILLION IS EQUIVALENT TO \$200,000 A YEAR AT THE OFFICIAL 10 PERCENT REAL DISCOUNT RATE. WE TAKE THIS \$200,000 AS BEING THE VALUE OF A LIFE YEAR, AS REVEALED BY THE SURVEY'S WILLINGNESS-TO-PAY PROCEDURE.⁵⁹

SINCE THE TOTAL POPULATION OF NEW ZEALAND IN 1990, WAS ABOUT 3.35 MILLION, A SIMILAR NUMBER OF AVERAGE LIFE YEARS WERE LIVED. VALUED AT \$200,000 AN AVERAGE LIFE YEAR, THIS GIVES A TOTAL OF \$670 BILLION (3.35M X \$200,000) FOR 1990. SUBGROUPS OF THE POPULATION MAY BE SIMILARLY VALUED, INCLUDING THOSE WHOSE LIVES ARE SAVED BY THE AVOIDING OF TRAFFIC ACCIDENTS, AND TOBACCO- AND ALCOHOL-INDUCED DEATHS. (NOTE THAT THE RATIO OF THE VALUE OF THE LIFE YEARS OF THE SUBGROUP, TO THE VALUE OF THE TOTAL LIFE YEARS OF THE POPULATION IS INDEPENDENT OF THE ACTUAL VALUATION OF A LIFE YEAR. THUS THE PERCENTAGE FIGURES GIVEN IN TABLES 2.1 AND 3.1 ARE NOT DEPENDENT UPON THE \$200,000 ESTIMATE.)

⁵⁸ T. MILLER & J. GURIA, *The Value of Statistical Life in New Zealand: Market Research on Road Safety*, Land Transport Safety Authority, Wellington, May 1991, p.1.

⁵⁹ STRICTLY THE \$200,000 IMPLIES THE PERSON WHOSE LIFE IS SAVED WILL LIVE IN PERPETUITY. HOWEVER IF WE ASSUME THAT THEY WOULD LIVE 43.5 YEARS, WHICH WOULD BE NEAR THE LIFE EXPECTANCY OF THE AVERAGE VICTIM OF A ROAD ACCIDENT, THE VALUE OF THEIR SAVED LIFE YEAR WOULD BE \$203,000, A FIGURE SO CLOSE TO \$200,000, THAT THE ADDITIONAL COMPLICATION MAY BE IGNORED.

THUS FAR WE HAVE DESCRIBED THE PROCEDURE AS IT APPLIES FOR A DEATH. HOWEVER INDIVIDUALS MAY SUFFER REDUCTIONS IN THEIR QUALITY OF LIFE AS A RESULT OF DRUG ABUSE (SUCH AS EMPHYSEMA FROM SMOKING OR BEING BEATEN BY A DRUNK). INsofar AS THIS REDUCTION CAN BE MEASURED AS A PROPORTION OF A NORMAL FULL LIFE, A MUCH MORE DIFFICULT TASK TO DO THAN TO WRITE ABOUT OR CONCEPTUALIZE, THEN THE PROPORTION CAN BE APPLIED TO THE VALUE OF A QUALITY ADJUSTED LIFE YEAR (I.E. \$200,000 IN 1990).

APPENDIX 3: THE PROBLEM OF VALUATION WHEN THE CONSUMER IS ADDICTED

AN INTEGRAL ASSUMPTION OF VALUE THEORY IS THAT CONSUMERS VALUE THEIR OWN CONSUMPTION, AND THAT THEY RATIONALLY SEEK TO MAXIMIZE THE BENEFIT OF THEIR CONSUMPTION AS BEST THEY CAN, SUBJECT TO VARIOUS LIMITATIONS SUCH AS THEIR INCOME AND BORROWING POWER. IT IS THIS ASSUMPTION THAT WAS IMPLICITLY USED EARLIER WHEN THE SPENDING OF THE SUBSTANCE USER WAS OFFSET AGAINST THE BENEFITS THEY OBTAINED FROM ITS USE.

MANY OF THOSE WHO WORK WITH (OR KNOW WELL) DRUG ADDICTS WOULD DOUBT THE VERACITY OF THIS ASSUMPTION AS FAR AS ADDICTIVE CONSUMPTION IS CONCERNED. ADDICTS THEMSELVES SAY THINGS SUCH AS THEY "WOULD PREFER TO GIVE UP THEIR HABIT BUT CANNOT", WHICH SEEMS TO UNDERMINE THE INTEGRAL RATIONALITY ASSUMPTION OF CONSUMER BEHAVIOUR, DESCRIBED IN THE PREVIOUS PARAGRAPH. HOW THEN IS THE ECONOMIC ANALYSIS TO DEAL WITH THIS SITUATION?

ONE ASSUMPTION IS TO ASSUME THAT ADDICTS ARE INDEED CONSUMING RATIONALLY, ACCORDING TO THEIR DESIRES, IF NOT THOSE OF WISER COUNSEL. IN THIS CASE THE BENEFITS OF SUBSTANCE CONSUMPTION EXCEED THAT OF THEIR OUTLAY ON THE SUBSTANCE, AND THE TRANSACTION IS TREATED JUST AS FOR OTHER COMMODITIES, SUCH AS POTATOES. THIS WAS THE APPROACH EXPLICITLY DESCRIBED IN THE APPLICATION OF THE SNA FRAMEWORK, AND IMPLICITLY IN THE CBA FRAMEWORK.

SUCH AN APPROACH - EQUIVALENT TO TREATING SUBSTANCE USE AS AN ORTHODOX COMMODITY - WOULD NOT BE ACCEPTABLE TO ALL OBSERVERS.⁶⁰ THE DIFFICULTY IS HOW TO MODIFY THE STANDARD ASSUMPTION IN VALUE THEORY, WITHOUT DESTROYING THE ENTIRE PARADIGM. VARIOUS WAYS HAVE BEEN SUGGESTED. HERE WE DESCRIBE THAT PROPOSED BY COLLINS AND LAPSLEY, NOT LEAST BECAUSE THEIR PROPOSAL IS INSTRUCTIVE AS TO THE ROLE OF THE COUNTERFACTUAL SCENARIO.

WE USE THE COUNTERFACTUAL PROPOSITION THAT THE SUBSTANCE HAD NEVER BEEN INTRODUCED INTO THE SOCIETY. THE COMPARABLE PROPOSITION AT THE PERSONAL LEVEL IS THAT THE INDIVIDUAL WHO IS NOW DEPENDENT ON THE DRUG NEVER TOOK UP ITS CONSUMPTION.

⁶⁰ SUBSTANCE ABUSE THEN BECOMES A CONSEQUENCE OF THE *externalities* imposed by the use on others.

THE ANALYSIS SAYS THAT THE DRUG USER WISHES TO GIVE UP THE USE BUT CANNOT. THIS IS EQUIVALENT TO, IN THE CONTEXT OF THE FRAMEWORK, A SITUATION IN WHICH (IF THEY KNEW AS MUCH NOW AS THEY DID AT THE TIME) THE USER WISHED HE OR SHE HAD NEVER TAKEN UP THE DRUG.⁶¹ SO THE CONSUMPTION OF THE DRUG IS OF NO VALUE TO THE USER IN THE COUNTERFACTUAL SCENARIO. IF USERS HAD NEVER STARTED WITH THE DRUG USE THEY WOULD BE AT LEAST AS WELL OFF TODAY AS IF THEY ARE WHEN CONSUMING THE SUBSTANCE. ON THIS BASIS COLLINS AND LAPSLEY ARGUE THAT THE EXPENDITURE ON THE SUBSTANCE USE BY ADDICTS IS ZERO, UNDER THE COUNTERFACTUAL PROPOSITION OF THE DRUG NEVER BEING INTRODUCED TO SOCIETY. THIS IS A PLAUSIBLE ARGUMENT, WHICH WHILE NOT UNDERMINING VALUE THEORY, LEAVES US WITH THE FAR-FROM-EASY EMPIRICAL TASK OF DECIDING THE PROPORTION OF SUBSTANCE USE TO WHICH THE ARGUMENT APPLIES.

I ADD THAT I AM SURPRISED BY THIS CONCLUSION, FOR WHEN I FIRST SAW THE AUTHORS ADDING SOME OF THE DRUG EXPENDITURE TO THE COI, MY INTUITION - WELL-FOUNDED IN VALUE THEORY - WAS REPELLED. YET ON REFLECTION, I ACCEPT THE LOGIC OF THE ARGUMENT PUT HERE - ALBEIT TENTATIVELY.

⁶¹ I HAVE NOT DESCRIBED IN THE MAIN TEXT HOW COLLINS AND LAPSLEY ARE CHARACTERIZING THE BEHAVIOUR OF THE ADDICT. THEIR EXPLANATION IS EMBODIED IN ORTHODOX VALUE THEORY (USING UTILITY AS A MEASURE) WITH THE PROPERTY THAT RECENT CONSUMPTION AFFECTS THE UTILITY OF CURRENT CONSUMPTION. THUS AN ADDICT IS ADDICTED TO A SUBSTANCE BECAUSE THEY HAVE USED THE SUBSTANCE IN THE PAST.