Economic Evaluation of Hepatitis C in Australia

Report prepared for:

The Australian Government
Department of Health and Ageing

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Glossary

ABBREVIATIONS:

AHC	Australian Hepatitis Council
AIHW	Australian Institute of Health and Welfare
AIVL	Australian Injecting and Illicit Drug Users League
ALT	Alanine transferase
AOD	Alcohol and other drug
ANCAHRD	Australian National Council on AIDS, Hepatitis C and Related Diseases
ASHM	Australasian Society for HIV Medicine
BMJ	British Medical Journal
CALD	Culturally and linguistically diverse
COAG	Council of Australian Governments
CPI	Consumer Price Index
DALY	Disability adjusted life year
DoHA	Australian Government Department of Health and Ageing
DHAC	Commonwealth Department of Health and Aged Care
HCCNSW	Hepatitis C Council of NSW
HEPack	Health Rights for Drug Users
HIV / AIDS	Human immunodeficiency virus / Acquired immune deficiency syndrome
GP	General practitioner
HCEP	Hepatitis C Education and Prevention Initiative
IDU	Injecting drug user
IGCAHRD	Intergovernmental Committee on AIDS, Hepatitis C and Related Diseases
HCC	Hepatocellular carcinoma
HCV	Hepatitis C Virus
HSD	Highly specialised drug
MACASHH	Ministerial Advisory Committee on AIDS, Sexual Health and Hepatitis
MHAHS	Multicultural HIV / AIDS and Hepatitis Service
MJA	Medical Journal of Australia
NCHECR	National Centre in HIV Epidemiology and Clinical Research
NESB	Non English-speaking background
NGO	Non Government Organization
NPHP	National Public Health Program
NPV	Net present value
NSP	Needle and syringe program
NUAA	NSW Users' and AIDS Association
OARS SA	Offenders Aid and Rehabilitation Services of South Australia
ONDCP	Office of National Drug Control Policy
PBS	Pharmaceutical Benefits Scheme
PHOFA	Public Health Outcome Funding Agreements
POP	Partners of Prisoners Program
QALY	Quality Adjusted Life Year
UNAIDS	United Nations Programme on HIV / AIDS
VIVAIDS	Victorian Drug Users Group
WHO	World Health Organization
WASUA	WA Substance Users' Association
WTP	Willingness to pay

ECONOMIC TERMS:

Cost to Government	A cost borne by government (such as health care treatment costs) as distinct from a private cost borne by individuals.
Cost-benefit analysis	A measure of the economic return associated with a program when its costs and benefits are valued in dollars.
Cost-effective	Criterion for assessing cost effectiveness.
Cost-effectiveness	Criterion for measuring the efficiency of a program by valuing its cost in relation to a defined outcome such as the number of cases of a disease avoided.
Cost-utility	A measure of the effectiveness of a program that compares the costs to the output measured in QALYs gained or DALYs averted.
DALY	Disability adjusted life year. Equivalent to the loss of one healthy life year.
DALY weight	A weight that measures the severity of an illness.
Direct cost	A cost that is directly attributable to the delivery of a good or service.
Discount rate	The rate at which future costs and benefits are discounted to the present.
Economic evaluation	A general term for an evaluation that measures costs or benefits or both in dollar terms.
Incidence	New cases of a disease that occur in a population during a defined period of time.
Lifetime disease cost	The discounted lifetime treatment cost of an incident case of a disease.
Prevalence	The proportion of individuals in a population having a disease at some point in time.
Prevalence cost	All costs associated with a disease during an identified year, including research, prevention, care and treatment.
QALY	Quality adjusted life year. Equivalent to a year of healthy life.
Treatment cost	Cost associated with delivery of health services in managing a disease.
Undiscounted	A valuation that assumes all costs and benefits have equal value regardless of when they occur.
Unit cost	The cost of delivering a unit of outcome.

Summary

The Australian Government and State and Territory Governments have committed to a variety of harm reduction, prevention and education initiatives in order to mitigate the spread of hepatitis C and other blood borne viruses. About 90% of incident cases of hepatitis C occur amongst injecting drug users (IDUs). This report is an economic evaluation of programs to control the hepatitis C epidemic.

The programs evaluated

The evaluation concerns five sets of programs associated with hepatitis C control. They can most readily be described either by purpose or by source of funding as follows:

- The Hepatitis C Education and Prevention Initiative (HCEP);
- Needle and Syringe Programs (NSPs);
- The Council of Australian Governments (COAG) Illicit Drug Diversion Supporting Measures for NSPs;
- State and Territory own purpose hepatitis C prevention and education initiatives; and
- National Public Health Program (NPHP) base funding for hepatitis C activities.

The programs are funded from a mixture of Australian Government and State and Territory sources but are administered largely by the States and Territories.

The evaluation covers the years 1999/00 – 2004/05, coinciding with the start of the HCEP and the COAG Supporting Measures. Estimated total spending on all the programs over this period amounted to $278m at constant 2004/05 prices.

Content and method of the evaluation

The economic evaluation is based on the incidence of hepatitis C among IDUs. Incident cases of hepatitis C among non-IDUs are assumed to be a fixed proportion of IDU incidence. The report includes estimates of:

- prevalence cost, which is all expenditure in 2004/05 associated with hepatitis C, including research, prevention, care and treatment;

- lifetime disease cost—the discounted lifetime treatment cost of an incident case of hepatitis C;

- cost-benefit—the estimated dollar value of all costs and benefits from the programs—including the estimated net benefit of the programs from 1999/00 to 2004/05;

- cost-effectiveness—the estimated cost per hepatitis C case avoided; and

- cost-utility —the estimated cost per disability adjusted life year (DALY) averted.

In 2004/05 the estimated prevalence cost of hepatitis C was $156m. This was based on an estimated 211,105 persons living with hepatitis C (mostly with stage 0/1 liver disease). The

estimated lifetime treatment cost per incident case of hepatitis C was $13,845 undiscounted and $5,797 discounted at 5% per annum.

The economic value of the programs was estimated by comparing the observed outcomes of all five programs with estimated outcomes under scenarios where one or more of the programs were not implemented.

Under Option A, none of the five programs would have been implemented.

Under Option B, HCEP would not have been implemented, but the other four programs would have been. Note that HCEP expenditure was about 7% of the total on all programs.

By far the major benefit of the programs is avoiding the spread of blood borne viruses, and in particular hepatitis C. Other benefits of the programs consist of better syringe disposal practices and reductions in accidental injuries in community settings.

Many aspects of the programs were originally established as a response to Human Immunodeficiency Virus (HIV) / Acquired Immune Deficiency Syndrome (AIDS). This report attempts to distinguish between the benefits of reductions in the incidence of hepatitis C and HIV / AIDS. However, the report does not apportion program overheads between the different targets.

All costs and benefits are estimated in 2004/05 prices. Costs were incurred from 1999/00 to 2004/05. Benefits occur over a longer period as morbidity and mortality are avoided. All costs and benefits are discounted back to 1999/00 at a central discount rate of 5% as well as at 0%, 3% and 7%.

Principal results for contribution of programs under Option A scenario (all programs)

The estimated discounted gross benefit from all five programs (Option A) is $1,153m. Their estimated discounted cost is $234m. The net benefit is thus $919m. If the benefits associated with HIV / AIDS are excluded, the estimated net benefit is $503m (Table 1).

Table 1: Summary returns from 5 education and prevention programs, (including NSPs) (Option A) and from HCEP (Option B) under central assumptions, 1999/00 – 2004/05, at constant 2004/05 prices, discounted back to 1999/00 at 5%

Indicator	Option A (5 programs)	Option B (HCEP)
Cost of programs ($m)	234	17
Incident cases of hepatitis C avoided (No)	29,111	727
Estimated gross benefit ($m)	1,153	22
Net benefit from all sources ($m)	919	6
Net contribution to Government saving	0	-12
Net benefit due to savings in hepatitis C ($m)	503	2
Cost per incident case of hepatitis C avoided ($)	2,208	17,316
Cost per DALY averted ($)	12,266	96,200

Source: Appendices 1 and 2

About 80% of the estimated total net benefit (including benefits of HIV / AIDS avoided) was a private benefit. There was a breakeven net benefit to Government (ie savings to Government were matched by costs to Government).

The estimated cost per incident case of hepatitis C avoided was $2,208. The cost per DALY averted attributable to hepatitis C avoided was $12,266. These two estimates indicate a high level of cost-effectiveness and cost-utility respectively.

Principal results for contribution of HCEP under Option B

The estimated discounted gross benefit of the HCEP Initiative is $22m. This produced an estimated net benefit of $6m including HIV / AIDS benefits and an estimated net benefit of $2m excluding HIV / AIDS benefits.

Because most of the benefits accrue to private persons or agencies, there is a net cost to Government of -$12m.

The estimated cost per incident case of hepatitis C avoided due to HCEP was $17,316. The cost per DALY averted attributable to hepatitis C avoided was $96,200.

Comparison of Options A and B

Options A and B provided a positive return. Every dollar spent on the package of five programs yields about $4.90 in benefits. A dollar spent on HCEP yields a benefit of about $1.33.

Although both Options provide benefits in terms of lower hepatitis C and HIV / AIDS, the savings from hepatitis C are much greater than for HIV / AIDS. For Option A, savings in hepatitis C contribute about 64% of the gross benefits. For Option B, the proportion rises to 82%.

Assumptions and sensitivities

The results reported above rely on various assumptions, including:

- the impact of hepatitis C education and prevention programs on the incidence of blood borne viruses;
- the different incidence of hepatitis C and HIV / AIDS among IDUs that use NSPs and those who do not;
- the ratio of non-IDU incident cases of hepatitis C (eg infections through skin piercing, etc) to IDU incident cases of hepatitis C; and
- the proportion of needles and syringes used by IDUs that are distributed through NSPs.

The report, however, finds that realistic changes in the main assumptions do not affect the sign of the results.

To ‘anchor’ the model, the study estimates values for certain variables such as the number of IDUs (188,000 in 2003/04), the average number of times that a syringe is reused (2.5) and the average number of occasions on which an IDU injects each day (1.3). The evidence on these is not very strong and the estimates need to be treated with caution.

The model does not seek to make projections with a high level of precision, but may be used to infer what might plausibly occur on the best evidence available or on the basis of reasonable assumptions where evidence is lacking.

Conclusions

The report finds that there are significant returns available from investment in hepatitis C education, prevention and harm minimisation programs.

Relatively modest changes in human behaviour appear to reduce incident cases of infection and contribute to better needle and syringe disposal.

Allowing for sensitivities in the discount rate and in various key parameters, the model suggests that the capacity of the programs to deliver benefits is robust.

The cost-benefit analysis shows that the highest economic gain, in relative and absolute terms, is from the combination of the five programs. As a standalone program, the HCEP would provide positive returns but relatively low ones.

The programs are also cost-effective, delivering reductions in the incidence of cases at a low cost per incident case avoided and at a low cost per DALY averted.

1. Terms of reference

The Terms of Reference for the evaluation are as follows:

- To update and expand upon the *Economic Analyses for Hepatitis C: A Review of Australia's Response* prepared by Mr Alan Shiell (1998), for the Commonwealth Department of Health and Family Services.

- To determine the direct and indirect costs of hepatitis C in terms of the burden of the disease on the Australian health system; and the costs, health benefits and savings resulting from the Australian Government's investment in hepatitis C education and prevention since 1999.

- To update estimates of the costs of hepatitis C to the health system (prevalence costs); and the lifetime treatment costs of a new case of hepatitis C (incidence-based costs).

- To provide cost-effectiveness, cost-utility and cost-benefit analysis of the Government's education and prevention strategies.

2. Outline and scope of the evaluation

It is estimated that 90% of incident cases of hepatitis C in Australia occur among IDUs (ANCAHRD, 2002). Sharing and reuse of un-sterile injecting equipment and blood splatter at the time of injecting are the most common source of infection. Others in the community who may have hepatitis C, or be at risk of becoming infected, include persons who patronise skin penetration practitioners (such as tattooists) and persons who had received transfusions of infected blood before screening of blood donors for hepatitis C was introduced in 1990.

The Australian Government and States and Territories have committed various harm reduction, education and prevention initiatives to mitigate the spread of hepatitis C and other blood borne viruses. Parallel to harm reduction, demand reduction initiatives seek to encourage IDUs to cease or reduce their use of drugs. Supply reduction initiatives, administered through the criminal justice system, aim to reduce access to drugs by intercepting illicit drug supply.

This evaluation estimates the impact of publicly-funded harm reduction, education and prevention initiatives. The scope of the study is restricted to their impact on health, even though these initiatives may also affect criminal activity, access to employment, interpersonal relationships and family stability. The evaluation also excludes initiatives directed at inmates of prison systems.

Harm reduction, education and prevention initiatives promote the use of safe injecting practices by way of NSPs as well as by referral to other programs operating in conjunction with NSPs, including information, peer education, counselling and treatment. Many such education and prevention programs make the work of NSPs more effective. The fuller context of the programs which are evaluated is set out in the literature review in Appendix 3.

Delivery of prevention and harm reduction programs is not a value statement about injecting drug use. It simply acknowledges that these practices occur and that without provision of sterile injecting equipment and information about safe injecting practices and access to health

information, counselling, prevention, and referral into treatment, added health risks may ensue to IDUs themselves and to others in the community.

3. Description of the programs

The evaluation covers sets of programs associated with hepatitis C prevention, education and control. Some programs are exclusively directed at hepatitis C and others target all blood borne viruses and may have originated (partly or wholly) as a response to HIV / AIDS. They have since evolved to include the management of other viruses, including hepatitis C. These programs can be described by purpose or by source of funding as follows:

- The Hepatitis C Education and Prevention Initiative (HCEP)—funded by the Australian Government
- Needle and Syringe Programs (NSPs)—funded partly by the States and Territories and partly from various Australian Government sources, including the Public Health Outcome Funding Agreements (PHOFA);
- The Council of Australian Governments (COAG) National Illicit Drug Diversion Supporting Measures for NSPs—funded by the Australian Government;
- State and Territory publicly-funded hepatitis C programs and activities; and
- National Public Health Program (NPHP) base funding for hepatitis C activities—funded by the Australian Government.

Although the programs with which this report is concerned are funded from a mixture of Australian Government and State and Territory Government sources, they are largely administered at operational levels by the States and Territories. The Australian Government in addition administers its own programs and directly funds some Non-Government Organisations (NGOs). The form of these arrangements represents an acknowledgement of the partnership between the Australian Government, State and Territory Governments and NGOs that is a feature of Australia's response to Hepatitis C.

The evaluation period is 1999/00 – 2004/05, coinciding with the commencement of some of the programs being evaluated. A broad indication of the activities of the programs and their costs are described below. Although, for convenience, the programs are described under separate headings, this is not to infer that they are discrete sets of standalone activities. In fact, in accordance with the partnership principle, there is significant interdependence and collaboration between different programs, regardless of the source of their funding or their type of administration.

3.1 Method of collecting data on expenditure

Data on the Hepatitis C Education and Prevention Initiative, the COAG National Illicit Drug Diversion Supporting Measures for NSPs, and National Public Health Program were supplied by the Department of Health and Ageing. The States and Territories supplied certain data on their own hepatitis C programs and on components of their needle and syringe programs. Not all data supplied by the States and Territories were consistent and there were data gaps.

Missing State or Territory data on own purpose hepatitis C program expenditure (other than NSPs) were standardised on a comparable State or Territory by multiplying the ratio of population to expenditure in the comparable State or Territory by the population in the State or Territory concerned. Missing State or Territory NSP expenditures were derived by multiplying the estimated 'delivered cost of a syringe' (syringe plus paraphernalia, education,

etc) by the projected number of NSP needles and syringes used by IDUs. Qualitative data were collected in the stakeholder consultations. A report on these consultations documenting stakeholder views on the programs, including their perceived strengths and weaknesses, is in Appendix 4.

3.2 The Hepatitis C Education and Prevention Initiative (HCEP)

HCEP is a program of special importance because it is the only prevention program which is dedicated to the hepatitis C epidemic, covering a range of target groups and activities at a national level. It is a major component of the national public health effort to address hepatitis C. It is also the primary expression of the centrality of partnerships by all levels of Government, including community organisations, medical practitioners, health workers, the research and scientific communities and people living with hepatitis C—as recognised by the first National Hepatitis C Strategy (DHAC, 2000) and reaffirmed by the second National Hepatitis C Strategy (DoHA, 2005).

When hepatitis C first emerged as a serious public health concern it was integrated into the HIV / AIDS infrastructure, as a 'related disease'. The launch of HCEP in conjunction with the first National Hepatitis C Strategy in 1999/00 marked the first opportunity to respond to the special needs of hepatitis C outside the HIV / AIDS agenda (Levy et al, 2002). Establishment of a dedicated Hepatitis C Section to administer HCEP within the Population Health Division of the DoHA also enhanced the partnership approach outlined in the National Hepatitis C Strategy.

As shown in Table 2, HCEP is funded by the Australian Government. Some 58% of the funding, however, goes to the States and Territories for administration of State and Territory hepatitis C education and prevention programs that are congruent with the objectives of HCEP and consistent with the aims of the National Hepatitis C Strategy. The balance of HCEP money is applied to Australian Government own purpose projects, national NGO funding and overheads. The Australian Government approves and monitors all funding which the States and Territories apply to their own projects.

When HCEP was introduced in the 1999/00 Budget, its purpose was described as being "to lower the current rate of transmission of hepatitis C in Australia by providing improved education, prevention and health maintenance for those currently infected and those at risk of becoming infected" (DHAC, 1999, section 2). It also seeks to minimise the personal and social impact of hepatitis C on those affected.

From its own purpose HCEP funding the Australian Government directly funds various strategic activities. These include funding for various NGOs such as the Australian Injecting and Illicit Drug Users League (AIVL), the Australian Hepatitis Council (AHC) and the Multicultural HIV/AIDS and Hepatitis Service (MHAHS), professional societies including the Australasian Society for HIV Medicine (ASHM) and external evaluation.

States and Territories apply their HCEP funds to a range of capacity-building projects covering community-based organisations, health professionals and groups with a special interest in hepatitis C. Most States and Territories, for example, have their own Hepatitis C Councils which have received funding from HCEP since its commencement. In general terms, State and Territory HCEP programs support:

- national education and prevention projects to assist key risk groups such as young people, Indigenous populations, persons in custody and illicit drug users;

- targeted programs for specific groups, such as assistance for culturally and linguistically diverse (CALD) communities;
- hepatitis C surveillance activities;
- training and educational resources for health professionals, including general practitioners, working in the hepatitis C area;
- production of a range of specialist and generalist publications and other information resources (including websites) to raise awareness about hepatitis C, its modes of transmission, the importance of testing and treatment options;
- peer education activities;
- networking opportunities such as workshops and conferences;
- awareness campaigns;
- projects to reduce the stigma and discrimination against people who may be infected with, or at risk of hepatitis C and who may otherwise be inhibited from accessing care and support services; and
- workforce development for specialists who may be reluctant to treat hepatitis C patients and for general practitioner (GP) training to enable awareness of hepatitis C risks and to support their training in treating hepatitis C patients with pharmacotherapy.

Butler and Quinn (2003) classify the State and Territory projects funded under HCEP into six major groups as follows:

i. The establishment and support of viable community-based organisations in each State and Territory to undertake education/prevention activities and provide care and support for people affected by hepatitis C.

ii. The development of education programs targeting people identified as being at higher risk of infection, including specific language groups.

iii. Improved research on hepatitis C in the areas of surveillance, epidemiology, and better practice in prevention education.

iv. An increased number of health care workers, including GPs, educated in the practise of appropriate infection control procedures and providing improved services for people with hepatitis C.

v. Preventing discrimination and reducing the stigma and isolation associated with living with hepatitis C

vi. Improved equity and access to prevention, education, treatment and care, and support services for a range of people affected by hepatitis C, including IDUs, people in custodial settings, people living outside urban areas and people of CALD communities.

Examples of the type of projects States and Territories have funded under each of these classifications are given in Appendix 8.1.

Some State and Territory stakeholders reported that there was a difficulty in directly relating the benefits of HCEP activities to decreased transmission of hepatitis C. To the extent, however, that HCEP can encourage increasing numbers of sympathetic and supporting health professionals to provide testing, treatment and counselling to persons living with, or at risk of hepatitis C, it may inhibit the spread of infection. Campaigns of peak organisations in promoting the interception and improved management of existing cases of hepatitis C by

health care workers may have thus indirectly moderated the epidemic. The National Hepatitis Awareness Week which ran between 23 and 27 May 2005, and was coordinated by the Australian Hepatitis Council in association with State and Territory Hepatitis Councils, is an example of this type of initiative, funded through HCEP. Using printed and web-based material, it had a budget of $27,000 and was directed at patients, GPs and other health care workers and was designed to enhance treatment awareness (AHC, 2005).

Although specialists and GPs participate in various levels of education and training, stakeholders report that there is still professional resistance to ongoing involvement in the treatment and management of clients with hepatitis C[1].

Table 2 provides details of the annual national cost of HCEP services. The trend in expenditure shows that in 1999/00, the year the program commenced, expenditure at current prices of $1.5m was less than half that in the years 2000/01 to 2000/05, during which time it was maintained at an annual average of some $3.5m. There were delays in launching the program in part because of delays experienced by States and Territories in receiving funds from the DoHA (to do with formalising the funding arrangements) and in part because of the time involved in the programs becoming operational. Start up problems that were quickly resolved included initial capacity building in rural and remote settings, as well as recruitment of suitable personnel, especially in some labour intensive projects (Butler and Quinn, 2003).

Over the period 1999/00 – 2004/05 as a whole, Table 2 shows that total HCEP expenditure amounted to $19.0m at current prices. After adjusting this figure for inflation, real expenditure in 2004/05 prices was $20.1m.

Table 2: Expenditure on the Australian Government Hepatitis C Education & Prevention Initiative, $m

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total
Australian Government own purpose outlays	0.8	1.3	1.1	1.3	1.2	1.1	6.8
Funding to State/Territory activities[a]	0.5	2.0	2.1	2.1	2.1	2.2	11.0
Other (Australian Government overheads)	0.2	0.2	0.2	0.2	0.0	0.3	1.1
Total (Current prices)	1.5	3.5	3.4	3.6	3.4	3.5	19.0
Total (2004/05 prices)	1.7	3.9	3.6	3.8	3.5	3.5	20.1

[a] Funds spent may not necessarily coincide with year of funding

3.3 Needle and syringe programs, including COAG measures

The commencement of NSPs in most States and Territories pre-dates this evaluation period by at least 10 years. NSPs were originally set up in the late 1980s to address HIV / AIDS and have since targeted hepatitis C and other blood borne viruses. NSPs are separately administered by each of the States and Territories but are funded from three public health sources. A few NSPs are operated by NGOs but they remain accountable to the States and Territories for their activities and expenditure. The sources of funding are:

- allocations by States and Territories from PHOFA — recurrent broadband funding subject to performance indicators, but which States and Territories may apply with greater discretion than specific purpose program funding;

[1] Relatively few GPs (apart from in Victoria) have in fact shown interest in participating in pharmacotherapy treatment and even fewer are active in this area; see Appendix 4.

- COAG National Illicit Drug Diversion Supporting Measures—program funding provided by the Australian Government; and
- State and Territory own funding.

NSPs take various forms which vary between States and Territories. They may deliver their services from primary outlets, fully funded to provide NSP services, or from secondary outlets such as hospital emergency departments, community health centres, sexual health services or pharmacies.

Mobile services use vehicles whereas outreach workers walk to engage and interact with IDUs. Dispensing machines[2] are also used, not all of which require IDUs to deposit money. Many needles and syringes are supplied by pharmacies on a retail basis, outside NSP arrangements, and these activities are not included in this evaluation[3].

Primary NSP outlets operated by health authorities and some NGOs—often under professional supervision—provide syringes and needles in a variety of sizes and gauges, depending upon IDU preferences, local policy and the type of drug being administered. All outlets also provide injecting paraphernalia and sharps disposal containers.

NSP staff may often be the first point of contact that IDUs make with health services and States and Territories report that they see NSP services as an integral part of their education and prevention activities. Nevertheless, depending upon the type of outlet, the quality and depth of the educational content associated with the supply of needles and syringes varies considerably. Where supply simply involves restocking a dispensing machine, for example, the provision of information is limited to that provided with the personal disposable container.

The application of funding to NSPs is complex and varies depending upon the jurisdiction concerned. This partly reflects that NSPs originated as State and Territory responses to HIV / AIDS. After hepatitis C was also recognised as a problem with a higher prevalence than HIV / AIDS, NSPs came to attract further layers of support and funding from the Australian Government. However, the COAG National Illicit Drug Diversion Needle and Syringe Programs Supporting Measures do not explicitly refer to hepatitis C.

There are variable and fixed costs associated with the operation of NSPs. Variable funding for NSPs in most States and Territories comes from PHOFA monies which is usually applied in varying proportions to the purchase of syringes and paraphernalia. NSP service delivery generally occurs with the assistance of staff establishments in areas such as drug and alcohol, sexual health or community health services. The basic staffing, logistic and related support services are thus generally met by States and Territories themselves, although these activities may also include some PHOFA money. The staffing cost hence may often be difficult to separate from other activities. All States and Territories in addition apply COAG money to support their NSP operations.

In most jurisdictions, the COAG National Illicit Drug Diversion Supporting Measures are the main source of fixed cost funding (Victoria, however, is a notable exception). Stakeholders reported that COAG support had materially increased the capacity of NSPs to work effectively. COAG money is four-year program funding and is more closely monitored than broadband PHOFA funding. The Australian Government disperses over 80% of COAG

[2] The term "dispensing machines" refers to both vending machines where syringes are purchased and dispensing machines where syringes are supplied at no cost to the client.

[3] The concern of the project is with publicly-funded programs. As non-NSP retail pharmacy transactions are a private cost, they are outside the scope of this evaluation.

funding to the States and Territories and applies the balance to own purpose projects and staffing overheads.

There are two components to the COAG NSP Supporting Measures: the NSP diversification initiative and the increasing education, counselling and referral initiative.

The NSP diversification initiative provides the States and Territories with direct operational support for their NSPs, including:

- extending the hours at which NSPs operate;
- the appointment of more peer educators to NSPs;
- increasing the number of secondary NSP outlets and dispensing machines; and
- training and support packages to encourage more pharmacies to participate in NSPs, especially in localities which may not have access to other NSP outlets. Between 50 to 70% of pharmacies in Australia now distribute needles and syringes[4]. In Western Australia and Queensland, however, the proportion is significantly higher than the national average.

Because it is specific purpose funding, COAG funding is the most readily identifiable source of NSP expenditure. NSP diversification funding is set out in Table 3. After 1999/00, the year in which the initiative commenced, expenditure between 2001/02 – 2004/05 remained fairly stable at about $4.0m a year. Over the period as a whole, the total national cost of NSP diversification amounted to $20.8m. After adjusting for inflation, the real cost in 2004/05 prices was $22.1m.

Table 3: Expenditure on the COAG NSP diversification initiative, $m

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total
Australian Government own purpose outlays	0.2	0.1	0.2	0.2	0.2	0.2	0.9
Funding to State/Territory activities	2.1	2.6	3.4	3.4	3.5	3.6	18.6
Other (Australian Government overheads)	0.2	0.2	0.2	0.2	0.2	0.2	1.3
Total (Current prices)	2.4	3.0	3.8	3.8	3.9	4.0	20.8
Total (2004/05 prices)	2.9	3.3	4.1	3.9	4.0	4.0	22.1

The COAG increased education, counselling and referral initiative is designed to enhance the overall functionality of community based NSPs through the provision of assistance for:

- increased and high quality education and counselling services for people attending NSPs—and to especially encourage and support clients into drug treatment;
- training for health care workers in NSPs;
- recruitment of additional staff to increase the quantity of drug education, counselling and referral available through NSPs; and
- support and training to enable non-NSP health professionals to refer persons at risk into NSPs.

Table 4 summarises the annual national cost of COAG increased education, counselling and referral services. In most States and Territories there was a lag between commitment and implementation (as with HCEP, in part because of the time involved in getting programs operational and in part because of delays experienced by States and Territories in receiving

[4] Advice from the Alcohol and Harm Reduction Initiatives Team, Drug Strategy Branch, Population Health Division, DoHA.

funds from DoHA). During the start up phase between 1999/00 – 2000/01, expenditure at current prices grew from $2.6m to $4.6m. During the period 2002/03 – 2004/05, annual expenditure was maintained at about $5.3m. Over the period as a whole, the total national cost of COAG increased education, counselling and referral amounted to $28.4m. After adjusting for inflation, the real cost in 2004/05 prices was $30.1m.

Table 4: Expenditure on the COAG increased education, counselling and referral initiative, $m

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total
Australian Government own purpose outlays	0.2	0.2	0.2	0.2	0.2	0.2	1.3
Funding to State/Territory activities	2.3	4.3	4.9	4.9	5.0	5.1	26.5
Other (Australian Government overheads)	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Total (Current prices)	2.6	4.6	5.2	5.2	5.3	5.4	28.4
Total (2004/05 prices)	3.1	5.1	5.6	5.4	5.5	5.4	30.1

The COAG NSP Supporting Measures have a specific set of objectives which are consistent with NSPs and represent their logical extension. Their overall role has thus been to enhance the capacity of NSPs to do their work.

Estimated expenditures on NSPs other than COAG sources are incorporated into summary Table 6. Funding from non-COAG sources mainly represents the variable component of NSP expenditure. It is partly derived from qualitative information some States themselves provided and partly from modelling based upon imputations of needle and syringe utilisation and estimates of expenditure by Health Outcomes et al (2002, Table 2.1) for 1999/00.

In round figures, as shown in Table 5, NSPs deliver 33 million sterile needles and syringes each year to IDUs.

Table 5: Projected IDU utilisation of needles and syringes, No million

Needles & syringes	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
Total[a]	34.1	34.5	34.8	35.2	35.5	35.9
Total distributed through NSPs[b]	31.8	32.2	32.5	32.8	33.1	33.4

[a] For 2003/04 from Applied Economics (2005); assuming annual growth for other years, proportional to the projected growth in the number of IDUs at 1% (see footnote 6 below and section 5.3 below).
[b] For 1999/00 from Health Outcomes (op cit, Table 2.1); assuming growth thereafter proportional to the growth in total needle and syringe utilisation.

The basis of the cost estimates other than COAG expenditure is the 'delivered cost of a syringe' at constant 2004/05 prices, where the latter represents the unit cost of a syringe, plus provision for an apportionment for container, paraphernalia, labour, etc, net of COAG contributions, as follows:

Syringe	0.13¢[a]
Sharps container, paraphernalia, labour (education, prevention, etc), logistics	0.60¢[c]
Total unit cost per 'delivered syringe' (2004/05 prices), excl. COAG	0.73¢[b]

[a] Applied Economics (2005).
[b] Cost to Government of the 31.8 million syringes distributed through NSPs was $19.7m in 1999/00 (excl. COAG) (Health Outcomes op cit, Table 2.1); the delivered unit cost of a syringe was thus 0.62¢ ($19.7m ÷ 31.8 million); the 2004/05 value for unit cost follows from adjusting the 1999/00 unit cost for inflation.
[c] Residual value (0.13¢ - 0.73¢ = 0.60¢).

Table 6 provides a summary of the estimated national cost of NSPs at constant 2004/05 prices, incorporating the delivered cost of needles and syringes together with the Australian

Government's COAG NSP Supporting Measure contributions. It excludes a relatively small amount of private expenditure which IDUs may themselves incur in obtaining syringes from dispensing machines and some pharmacies (especially in South Australia and Western Australia)[5]. It nevertheless includes the cost of public subsidies paid to pharmacies. Table 6 shows that the estimated delivered cost of needles and syringes in constant 2004/05 prices rose from $23.2m in 1999/00 to $24.4m in 2004/05 prices. Over the period as a whole the estimated variable cost was $142.6m.

Table 6: Summary of national expenditure on NSPs, $m, constant 2004/05 prices

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total
NSPs, excl. COAG[a]	23.2	23.4	23.6	23.9	24.1	24.4	142.6
COAG NSP diversification initiative	2.9	3.3	4.1	3.9	4.0	4.0	22.1
COAG increased education, counselling & referral initiative	3.1	5.1	5.6	5.4	5.5	5.4	30.1
Total NSPs	29.1	31.9	33.3	33.3	33.5	33.8	194.8

[a] Delivered cost of a syringe at 2004/05 prices (0.73¢) × the projected number of NSP needles and syringes used by IDUs in each year from Table 5.

Between 1999/00 and 2004/05, total estimated national annual public expenditure on NSPs at constant 2004/05 prices rose from $29.1m to $33.8m, representing an overall increase of some 16%. Over the period as a whole, the total national cost of NSPs amounted to $194.8m. Once delays in accessing COAG funding had been overcome (after 2000/01), year to year change in spending on NSPs can be explained largely by the population of IDUs multiplied by the proportion of needle and syringe utilisation attributable to NSPs (Table 5)—which in turn drives the use of needles and syringes and associated services.

Over the period 1999/00 – 2004/05, numbers of IDUs were assumed to have remained relatively flat—allowing for a net annual growth in the demand for needles and syringes of just 1%[6]. This is substantially less than the 8% net annual growth employed in the modelling by Health Outcomes (op cit, section 3.3.1, p 27). Since the work of Health Outcomes (op cit), there have been indications that a reported 'drought' in heroin (the IDU drug of choice) may have been deflecting drug users not only into alternative types of drugs (eg amphetamine) but also into alternative methods of drug administration[7].

3.4 State and Territory hepatitis C education and prevention initiatives

As acknowledged by the second National Hepatitis C Strategy, State and Territory Governments are critically important to the partnership principle in furthering the national response to hepatitis C (DoHA, 2005, p26). State and Territory Governments exercise this responsibility through their own purpose programs in accordance with their own hepatitis C strategies both at regional or area health service levels—as well as at the State and Territory-wide level. Expenditure on these programs represents the central component of the *individual* responses of States and Territories to hepatitis C—whereas their NSP expenditure constitutes an element of their *coordinated* response to hepatitis C.

[5] See footnote 3 above; in 1999/00 the private component of NSP expenditure represented about 11% of total NSP expenditure; Health Outcomes op cit, Table 2.1; Tables 3 & 4 above.
[6] Personal communication with Dr Matthew Law, National Centre in HIV Epidemiology and Clinical Research, 4 May 2005; see also section 5.3 below.
[7] Ibid; personal communication, Dr Alex Wodak, 2 May 2005; see also Table 5 above.

State and Territory own purpose prevention and education programs are conceptualised within public policy and legislative frameworks consistent with the aims and objectives of the National Hepatitis C Strategy. Programs range from those exclusively directed at hepatitis C to other broader initiatives covering all blood borne viruses. They include local expenditure on collaborative initiatives for:

- hepatitis C prevention, information, treatment and care, and support;
- investigation, analysis and monitoring the epidemiology of hepatitis C;
- development, delivery and evaluation of a range of services, including public hospital services, health promotion (including media campaigns), school based health education, corrective health services and care and support services provided by public and community-based organisations;
- provision of workforce infrastructure and professional development and training for health professionals in the hepatitis C area, including those working in Aboriginal and Torres Strait Islander primary health care services;
- provision of preventive programs and treatment services in custodial settings; and
- creation of appropriate forums for effective intersectoral cooperation between State and Territory and Local Government agencies.

For many of these initiatives, the States and Territories have funded NGOs to provide services. State and Territory-based agencies such as community health centres or hospitals have also been funded. Projects range from small, one-off initiatives attracting less than $10,000 to much larger projects funded over several years. Examples of projects classified by major themes are given in Appendix 8.2.

Particular case studies of projects that States have nominated as 'success stories' are described in Boxes 1 – 3 as examples of how some State and Territory own purpose hepatitis C initiatives have been conducted.

Box 1: NSW—"Hepatitis C—understanding is the answer"

Between March and April 2000 the NSW Department of Health launched a successful media campaign, under the banner: "Hepatitis C—understanding is the answer". The campaign had a budget of $0.6m and was described by the NSW Health Chief Medical Officer as being "the first time in the world that a hepatitis C campaign had been targeted at the general community" (Media release, 2 March 2000).

It featured prime-time television advertisements, posters and advertisements and support activities in Area Health Services highlighting the community's lack of understanding of hepatitis C, with a view to promoting greater awareness. To maximise audience reach, the campaign also ran in the ethnic and Indigenous media. A 'Hep C hotline' was available throughout the campaign to enable people to easily obtain further information.

An independent evaluation found that the campaign, in conjunction with the hotline in particular, was an important strategy for generating public interest about hepatitis C (Chen et al, 2005).

In July 2001, as a follow up, the Hepatitis C Council of NSW (in collaboration with the NSW Department of Corrective Services and NSW Corrections Health Service) opened the "NSW Prisons Hep C Helpline", for prisoners, their families and Corrections staff.

Box 2: South Australia—Rural and remote hepatitis C education and prevention

This project commenced in 1999-2000 and is the only dedicated South Australian service providing Hepatitis C education, information and support for health and welfare workers and people affected by hepatitis C (including prisoners and injecting drug users) in rural and remote areas. Delivered through the Hepatitis C Council of South Australia, the project has played a pivotal role in enhancing the capacity of rural health and welfare workers to provide appropriate, non-discriminatory services to people affected by hepatitis C. It has established strong working links with country providers, provided linkages to education and support for people living with and at risk of hepatitis C in these settings and has developed an invaluable body of corporate knowledge over four years.

From July 2004, the primary focus of the Rural Education Officer has been to participate in a collaborative partnership with Nunkuwarrin Yunti and the Aboriginal Drug and Alcohol Council to undertake final planning and implementation of a State-wide hepatitis C health promotion project targeting Indigenous youth. Titled 'Tune into your Health – It's in your Blood', this project was designed to promote basic messages about hepatitis C prevention through the utilisation of health education, song writing and song recording techniques. The final 'product' was a compilation CD, featuring songs written and recorded by Indigenous youth, with 1,000 copies produced for distribution back through SA Indigenous communities. The launch of the CD was scheduled to take place during Youth Week 2005 (SA Department of Health, 2005).

Box 3: Victoria—*Acting Up* project[8]

The *Acting Up* initiative is a hepatitis C education and prevention project, aimed at people 30 years or younger that use illicit drugs. The initiative utilises the medium of dramatic art to disseminate harm reduction information and to develop community awareness on a number of levels. Not only do the peer participants in the audience receive this information in a relevant context, but the Peer Educators / Performers have also undergone intensive harm reduction training through the rehearsal process. Furthermore, all participants are exposed to the connection and self-esteem building that is integral to *Acting Up*.

The trajectory of the project has seen a twelve-week development / rehearsal stage followed by an ongoing performance stage, the latter commencing on 10 December 2004 at St Kilda's Access Health.

Through successful grant applications from local government, the project has engaged a permanent team of five Peer Educators / Performers that interact with five recruited peer participants at every performance. The twentieth community performance has recently been completed. Since embarking upon the performance phase, *Acting Up* has also been invited to participate in training sessions for youth and alcohol and other drug (AOD) workers and in an unanticipated schedule that has also included rural services. For young injectors, the forty-minute performance has meant enhanced access to information where literacy is not a barrier. Scenarios are portrayed that reflect the reality of injectors' lives and the information-sharing that occurs between illicit drug-using peers.

In the words of a Peer Educator / Performer " …so our work is important and serious but it is also fun. It's fun because it can be delivered in a suitable way to a targeted group. For us, it's creativity through theatre and via like-minded people."

This project is managed by the Victorian drug user organisation, VIVAIDS

[8] Material supplied by the Department of Human Services, Victoria, August 2005

In so far as possible this study has attempted to collect aggregate expenditure on own purpose hepatitis C prevention and education programs, other than NSPs, from each of the States and Territories. As shown in Table 7, between 1999/00 – 2004/05 expenditure on programs, other than NSPs, was uneven, but approximated $9.0m a year in current price terms and about $9.5m in 2004/05 prices. More than 60% of State and Territory expenditures occur in NSW and Victoria. Total estimated expenditure over the period 1999/00 to 2004/05 was $53.5m in current prices and $57.0m after adjusting for inflation.

Table 7: Estimated State & Territory own purpose expenditure on education and prevention of hepatitis C, excluding NSPs[abc], $m

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total
NSW	2.4	3.5	3.4	3.3	3.5	3.5	19.8
Victoria	1.9	2.6	2.5	2.5	2.6	2.6	14.6
Queensland	0.7	1.2	0.7	1.0	0.9	2.0	6.5
Western Australia	0.6	0.7	0.7	0.7	0.2	0.7	3.6
South Australia	0.5	0.5	0.5	0.6	0.6	0.6	3.2
Tasmania	0.2	0.3	0.3	0.3	0.3	0.3	1.6
Northern Territory	0.2	0.3	0.3	0.3	0.3	0.3	1.6
ACT	0.4	0.4	0.4	0.4	0.5	0.5	2.6
Total (Current prices)	6.7	9.4	8.9	9.1	8.9	10.6	53.5
Total (2004/05 prices)	7.9	10.4	9.6	9.5	9.1	10.6	57.0

[a] Some State and Territories may also include some expenditure on HIV / AIDS and other blood borne viruses.
[b] Gaps in data supplied by certain States and Territories were estimated by standardising on a comparable State or Territory by multiplying the ratio of population to expenditure in the comparable State or Territory by the population in the State or Territory concerned.
[c] As priorities altered each year, and in some instances focused on local research initiatives, some funding has not been reflected in the total annual funding in some jurisdictions as research activity was not within the scope of this project.

3.5 National Public Health Program

The Australian Government conducts a range of national activities and carries various overheads in leading, communicating and implementing national policy on the prevention of blood borne viruses. These are supported by National Public Health Program (NPHP) base funding. They are broadband expenditures which differ from the support provided to the States and Territories that is essentially for operational initiatives associated with services or materials and equipment procurement.

Table 8: Australian Government National Public Health Program base funding for hepatitis C activities, $m[a]

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total
Australian Government own purpose outlays (Current prices	0.8	0.8	0.9	0.9	1.0	1.0	5.3
Australian Government own purpose outlays (2004/05 prices)	0.9	0.9	0.9	0.9	1.0	1.0	5.7

[a] Estimated at $1.0m in 2004/05, with growth in current price terms at 5% per year between 1999/00 and 2004/05, as advised by the Hepatitis C Section, Targeted Prevention Programs Branch, DoHA.

NPHP funding is used to support activities and advisory structures such as the Intergovernmental Committee on AIDS, Hepatitis C and Related Diseases (IGCAHRD) as well as various hepatitis C program activities and support for operation of NGOs such as AIVL, ASHM, and the AHC. Funding for these organisations is in addition to funding provided under HCEP.

Funding from the NPHP for hepatitis C related activities are set out in Table 8. Expenditures rose from $0.8m in 1999/00 to $1.0m in 2004/05 at current prices. Total expenditure over the period as whole was $5.3m and in 2004/05 prices it was $5.7m.

3.6 Total cost of programs

Table 9 summarises the cost of all of the programs concerned with NSPs and hepatitis C over the period 1999/00 – 2004/05 at 2004/05 prices. About half of this represents fixed costs (including the COAG components of the NSP program). The trend in expenditures was influenced by the time involved in getting the HCEP and COAG programs operational in 1999/00. Between 2000/01 and 2004/05 total annual expenditure approximated $47.0m. Over the period as a whole, total real spending amounted to $277.6m.

Table 9: Summary of expenditure on all Australian Government and State / Territory programs relating to NSPs and hepatitis C education and prevention and support initiatives, $m, 2004/05 prices

	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total
HCEP	1.7	3.9	3.6	3.8	3.5	3.5	20.1
NSPs, incl. COAG Measures	29.1	31.9	33.3	33.3	33.5	33.8	194.8
State / Territory, excl NSPs	7.9	10.4	9.6	9.5	9.1	10.6	57.0
NPHP	0.9	0.9	0.9	0.9	1.0	1.0	5.7
Total	39.7	47.1	47.4	47.5	47.0	48.8	277.6

Discounted back to 1999/00 at 5%, total NSP and hepatitis C program expenditure was $233.8m. For the purposes of the economic evaluation, the latter figure will constitute the valuation of the cost of the programs and will be used in testing the worth of their contribution to the control of hepatitis C.

4. Prevalence costing

One method of costing the hepatitis C epidemic is to consider all financial costs associated with the disease during an identified year—known as a prevalence cost. Prevalence costing differs from an economic evaluation in three important respects. First, prevalence costing is an aggregation of all costs under a single known scenario; second, it shows the size of a disease in money terms, without a statement about the value of any dollar spending; and third, it is restricted to financial costs and ignores the economic costs that are inherent in an economic evaluation.

In contrast, costing for an economic evaluation draws upon elements of a prevalence costing, but usually collects time series data, rather than concentrating on a single year. Furthermore, as discussed in section 5, in an evaluation of prevention and harm minimisation it is necessary to distinguish the stream of surveillance and prevention costs from the costs of the disease itself.

In this section the prevalence cost of hepatitis C paid for by government during the year 2004/05 (at current prices) was considered. The constituent elements of this costing are the following categories of expenditure:

- Research and screening;
- Prevention, harm minimisation, etc; and
- Diagnosis and treatment.

4.1 Research and screening

The main areas in which research and screening expenditure was incurred on hepatitis C and the estimated funding they attracted during 2004/5 (excluding as far as possible funding for other blood borne diseases) were:

- Blood screening through the Red Cross $9.9m[a]
- four major, university-based research organisations whose activities cover hepatitis C research (together with HIV / AIDS and sexual health)—core funding from DoHA:

The Australian Centre in hepatitis C and HIV Virology Research	$8.6m
National Centre in HIV Epidemiology and Clinical Research	$3.0m
National Centre in HIV Social Research	$4.5m
Australian Research Centre in Sex, Health & Society	$2.3m
TOTAL	$28.3m

[a] Estimate based on cost of reagents, disposables & labour; excludes depreciation; includes screening only for hepatitis C.

The best estimate of the amount spent on hepatitis C research and screening during 2004/05 is thus $28.3m.

4.2 Prevention and harm minimisation

The estimated aggregate expenditure during 2004/05 from programs, described in detail in section 3 above and summarised in Table 9, is $48.8m.

4.3 Diagnosis and treatment

The series of costs associated with the diagnosis and treatment of hepatitis C represents a financial measure of the burden of the disease. These costs are a direct function of the number of people living with hepatitis C during 2004/05 and the various stages of the progression of the disease in this group of people. In a meta analysis of studies of the prevalence of hepatitis C, Australian National Council on AIDS, Hepatitis C and Related Diseases (ANCAHRD) (2002) found that the proportion of regular IDUs with hepatitis C has consistently been between 50% and 70% since the early 1970s—although it may have decreased somewhat since 1995.

The epidemiological model developed by ANCAHRD (2002) predicts, according to its central estimates, that 282,000 persons would carry hepatitis C antibodies in 2005, of whom:

- 71,000 persons will have cleared their hepatitis C infection
- 166,000 persons are living with chronic hepatitis C infection and stage 0/1 liver disease
- 36,000 persons are living with chronic hepatitis C infection and stage 2/3 liver disease
- 8,800 persons are living with hepatitis C-related compensated cirrhosis
- 236 persons have developed hepatitis C-related liver failure
- 69 persons have developed hepatitis C-related hepatocellular carcinoma (HCC)

- 1,470 persons will die from hepatitis C-related causes

Most persons living with hepatitis C may remain undiagnosed and untreated for most of the natural life of their infection. Appendix 5 schematically describes the standard protocol for managing persons at risk of hepatitis C and for their ongoing treatment and monitoring in an ideal world.

At the primary level of care, all persons at risk need to be counselled and offered the opportunity of testing which in the first instance will be hepatitis C Ab testing[9]. Based on the result of the test, they should receive further counselling. If the test is negative, and they remain at risk, there should be six-monthly follow-up consultations or at specific times of real risk behaviour, when testing could again be discussed and arranged to review their risk status, accompanied by further testing as appropriate.

If a test is positive it may indicate current infection or previous exposure and viral clearance. Of those exposed to the virus, 25-30% appear to clear the infection. A majority of patients infected with hepatitis C have no symptomatic episode and are unaware of the infection. Of those with ongoing (chronic) infection 15-20% may have symptoms which include malaise, lethargy and excessive tiredness. A small percentage will progress to cirrhosis, liver failure and liver cancer over a 20-30 year period. In the first 10 years of infection it is unlikely that many individuals will require active therapy although added insults to the liver such as from alcohol abuse or obesity may accelerate the progression of liver damage.

There are effective treatments for hepatitis C. Combination therapy consisting of pegylated interferon and ribavirin is available as a government subsidised therapy under the Pharmaceutical Benefits Scheme (PBS) and currently represents the most effective treatment available. Only a minority of those who test positive, however, proceed to treatment.

One of the barriers to treatment are the PBS restrictions applied to hepatitis C treatments, including the requirement for a liver biopsy—an intervention which in itself carries risks. Treatment may also be associated with side effects and only designated hospitals with liver clinics that can monitor patients and manage their side effects or prescribers in the community who have links to these centres may supply treatment. Private travel costs too, may be incurred if a patient does not reside in proximity to a designated treatment centre. As a consequence, the number treated may be much less than those who could benefit from treatment. In 2002/03 approximately 2,000 persons sought pharmacotherapy treatment. Depending on the genotype of the hepatitis C virus, patients may need to take a course of combination therapy for either 6 or 12 months at a monthly cost in the order of $2,500 per patient. The total cost of pharmacotherapy to Government during 2003/04 was $28.1m[10].

For most persons infected with hepatitis C, the treatment costs thus consist of professional review and assessment services, pathology and other investigations, and for those who agree to a biopsy and elect to be treated, combination therapy. Less than 10% of persons infected with hepatitis C may eventually suffer significant liver disease and require a transplant; they also risk developing HCC.

There is a fundamental difference between those who are treated with pharmacotherapy and achieve a sustained viral response and those who are treated holistically and either clear the virus spontaneously or remain asymptomatic. Provided they do not become reinfected, those

[9] The following paragraphs are based on advice from Professor Robert Batey, John Hunter Hospital, Newcastle.
[10] Estimate supplied by the Hepatitis C Section, Targeted Prevention Programs Branch, Population Health Division, DoHA.

who clear the virus cease to become a source of infection and thereby contribute to a reduction in the epidemic. Those who are treated holistically, and do not clear the virus spontaneously, remain infectious and represent a potential health risk to others. While increasing the treatment coverage may be costly, it may also represent an important part of a preventive strategy.

A prevalence cost of diagnosing and treating hepatitis C in 2004/05 can be obtained by multiplying the number of persons at each stage of hepatitis C by the respective unit costs of each stage (Table 10). The unit costs derived for this purpose are weighted unit costs that, despite the high cost of pharmacotherapy, take into account that most chronic cases remain undiagnosed or untreated or both. They are based on work by Butler and Quinn (2003) updated to reflect 2004/05 prices and include all medical, hospital, laboratory and pharmaceutical costs, etc. Costs for liver failure assume that 50% of cases receive a transplant. Persons under continuing management after a liver transplant are not enumerated in ANCAHRD (2002) and their cost is not included in Table 10. The cost of death is not a part of the prevalence costing, but will be accounted for in the economic modelling in section 5 below.

Multiplying ANCAHRD's estimates of the number of carriers at each stage of the disease's progression by their respective unit costs yields a total prevalence cost, as shown in Table 10, of $78.9m in 2004/05 prices.

Table 10: Estimated treatment costs of hepatitis C by stage of progression in 2004/05, $, 2004/05 prices

	Annual unit cost[d]	Persons[e]	Total Cost[h]
Chronic hepatitis C, stage 0/1 liver disease[a]	239	166,000	39,674,000
Chronic hepatitis C, stage 2/3 liver disease[a]	239	36,000	8,604,000
Hepatitis C-related compensated cirrhosis[a]	448	8,800	3,942,400
Hepatitis C-related liver failure[bc]	78,639[g]	236	18,558,804
Hepatitis C-related HCC[bg]	118,146	69	8,152,074
TOTAL		211,105	78,931,278

[a] Prevalent cases
[b] Incident cases
[c] Cost of transplant in year in which the transplant occurs
[d] 1999/00 prices from Butler and Quinn (2003, Table 5) inflated by the CPI.
[e] ANCAHRD (2002)
[g] Incident cost of transplant ($157,278) × by the proportion of cases treated by transplant, assuming 50% cases receive a transplant
[g] Weighted for the proportion of cases treated by surgery and those who are not (Butler and Quinn, 2003, Table 5)
[h] Includes all medical, hospital, laboratory and pharmaceutical costs, etc

4.4 Total prevalence cost, 2004/05

A summary of prevalence cost is thus set out below and shows an estimated total of $156m during 2004/05.

Research and screening	$28.3m
Prevention, harm minimisation, etc	$48.8m
Diagnosis & treatment	$78.9m
Total	$156.0m

4.5 Lifetime cost of treatment

By making assumptions about the progression of hepatitis C in a hypothetical cohort of patients it is possible, following Brown and Crofts (1998), to model the lifetime cost of the disease with constant transition probabilities. Interpretation of the progression of hepatitis C and the intervals at which different stages of the disease are likely to become evident varies. An approach based on Sheill (1998), where for every 1,000 infected persons, 250 spontaneously clear within six months and the others become chronic sufferers, has been adopted (Table 11). For the first 10 years these chronic patients are likely to be asymptomatic, but characterised by fluctuating levels of alanine transferase (ALT) (an enzyme found in the liver and other tissues). In patients with persistently elevated levels of ALT (which is a sign of liver disease) there are 80 cases of compensated cirrhosis after 20 years (Table 11). The prognosis of patients with cirrhosis will be relatively good.

Table 11: Elements of lifetime cost of hepatitis C per 1,000 persons at 2004/05 prices, projected over 55 years

No cases by Year 55 (Total = 1,000 in Year 1)[a]	*Disease stage*	*Total cost, discounted at 0%, $000s*	*Total cost, discounted at 5%, $000s*
250	Spontaneous clearance[b]	-	-
642	Chronic hepatitis C liver disease[b]	8,788	3,142
80	Hepatitis C-related compensated cirrhosis[b]	1,450	323
9	Hepatitis C-related HCC[b]	1,063	840
19	Hepatitis C-related liver failure with transplant[bc]	1,494	950
	Liver failure management after transplant, years 1 – 10[d]	1,049	541
		13,845	5,797

[a] Sheill (1998)
[b] Unit costs from Table 10 × years × cases
[c] Assumes 50% of cases receive a liver transplant
[d] Annual unit costs at 1999/00 prices for continuing management after a transplant, from Butler and Quinn (2003, Table 5), inflated by the CPI ($11,047) × years × cases

Of the other patients with elevated ALT, after a further 25 years, 9 will have developed HCC and 19 will have developed liver failure (Sheill, 1998). It is assumed that 50% of the latter will receive a liver transplant and on average will survive for a further 10 years (Ghobrial et al, 2001). The annual unit cost of continuing care after a liver transplant (at 2004/05 prices) is $11,047 (Butler and Quinn, 2003). Applying unit costs used in Table 10 relevant to each of the other stages of the disease, the model runs for 55 years.

Table 11 shows that the undiscounted cost of treating the total cohort of 1,000 cases of hepatitis C is $13.5m and discounted at 5%, the cost is $5.8m. This is equivalent to an undiscounted lifetime cost for each incident case of hepatitis C of $13,845 and discounted at 5%, a lifetime incident cost of $5,797. The latter figure will be used in the economic evaluation for the treatment cost of incident cases of hepatitis C avoided as a result of government programs.

5. The economic evaluation

5.1 Measures of evaluation

In contrast to a prevalence costing, an economic evaluation compares the stream of hepatitis C program costs with the costs of hepatitis C itself over time. This means it is

possible to test the usefulness of the programs with reference to various measures of value or worth. The economic evaluation of public hepatitis C programs identified in section 3 accordingly incorporates three such measures:

- a cost-benefit analysis, which subject to the data available, aims to estimate the dollar value of all costs and benefits flowing from the programs;
- cost-effectiveness, which estimates the cost per hepatitis C case avoided; and
- cost-utility, which estimates the cost per disability adjusted life year (DALY) averted per hepatitis C case avoided.

The most comprehensive method of economic evaluation is cost-benefit analysis, because it seeks to take all effects into consideration (not just the avoidance of hepatitis C) and measures them in money terms. The evaluation period covers the years 1999/00 – 2004/05, coinciding with the start of the majority of the programs up until the most recent year at the time of writing. The costs and benefits are estimated in constant 2004/05 prices.

5.2 Specification of Options / scenarios

The economic evaluation compares the effects of programs compared with a Base Case scenario. In this study the Base Case is the observed experience which incorporates all five programs. Two comparator scenarios are considered.

Option A projects what would have occurred in the evaluation period if the five programs identified in section 3 had not been implemented.

Option B projects what would occur if HCEP had not been implemented, but the other four programs would have been.

In assessing the effects of each Option it is necessary to consider their respective incremental costs, as identified in section 3 and summarised in Table 9, in relation to their benefits.

The main benefits of the Options are avoiding health care costs and the spread of blood borne viruses. The Options also contribute secondary benefits associated with better syringe disposal practices and reductions in accidental injuries in community settings.

The flow of the net benefits (costs minus benefits) are measured as they accrue throughout the period of the evaluation between 1999/00 and 2004/05 and are discounted back to 1999/00 at a central discount rate of 5% as well as at 0%, 3% and 7%.

Cost-effectiveness is measured as the ratio of net incremental cost (program costs minus direct benefits) to either cases of hepatitis C avoided or, in the case of the cost utility analysis, to DALYs averted.

All of the programs evaluated may be expected to reduce the spread of all blood borne viruses, including in particular hepatitis C and HIV / AIDS. As remarked above, many of the initiatives such as NSPs were originally established as a response to HIV / AIDS.

This study does not seek to apportion program overheads between different targets of prevention and harm minimisation. Instead the modelling allows for the program benefits

both of hepatitis C and HIV / AIDS incident cases avoided. The modelling nevertheless distinguishes between hepatitis C and HIV / AIDS contributions to benefit.

5.3 Characteristics underlying all scenarios

All scenarios modelled possess certain common structural characteristics. At the heart of the modelling is a population of IDUs that is most at risk of contracting and transmitting hepatitis C, as a consequence of their injecting behaviour. There is also a subsidiary population of non-IDUs at risk who develop hepatitis C as a constant fixed proportion of the infected IDU population. Following ANCAHRD (2002), 91% of incident cases occur in the former and 9% in the latter.

Key drivers in the modelling of hepatitis C in the IDU population are:

- the size of the IDU population;
- the number of syringes in circulation that are used each year by IDUs;
- the number of times each syringe is reused; and
- the frequency with which IDUs inject.

Assuming that occasions of syringe reuse and the number of occasions per day that IDUs inject remain constant, the demand for syringes (where there is zero or negligible user price at the point of consumption) will be directly proportional to the number of IDUs.

There is uncertainty about the precise number of IDUs in Australia. Hall et al. (1999) reported that there were 197,000 regular IDUs in 1997. The 1998 National Drug Strategy Household Survey (AIHW, 2000) found that 350,000 people had injected illicit drugs at some time in their life and over 130 000 people had injected at least once in the previous 12 months. The 2004 National Drug Strategy Household Survey (AIHW, 2005) reported that 313,500 people had injected at least once and that 73,800 people had injected in the previous 12 months.

This study estimates that there were 188,000 IDUs in 2003/04. This number was derived by allowing some 35 million syringes (Table 5) were used on average 2.5 times in that year (Caulkins et al, 1998) and that IDUs injected on average 1.3 times per day [(35.5 million × 2.5) ÷ (365 × 1.3)]. The 2003/04 IDU estimate is within the range of other estimates and is used to anchor projections over the period 1999/00 – 2004/05.

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Table 12: Notifications of hepatitis C, 1999 – 2003, by age group[b]

Age group	1999	2000	2001	2002	2003
0 - 14	153	127	83	103	65
15 - 19	1,208	1,206	1,041	767	604
20 - 29	5,943	6,060	5,723	4,586	4,078
30 – 59	11,052	11,301	11,285	10,203	9,215
60 +[a]	812	793	792	650	537
Total	19,168	19,487	18,924	16,309	14,499

[a] Includes age not reported.
[b] Total 'reported diagnoses' (as distinct from reported young adult diagnoses) are not necessarily equivalent to incident cases, since in older age groups diagnosis may occur many years after seroconversion.
Source: NCHECR (2004) Table 2.1.7, p 54; reproduced in DoHA (2005) Figure 1, p 4.

There are no contemporary hard data on change in the IDU population. This study assumes a 1% growth per year over the period 1999/00 – 2004/05. This assumption is an approximation inferred from evidence of a steady decline between 1999 and 2003 in the number of notifications of hepatitis C—and in particular, as shown in Table 12, in the 50% decline in

notifications in the 15 – 19 age group and the 31% decline in the 20 - 29 age group. The total number of notifications is a proxy measure of hepatitis C prevalence. In young adult age groups, however, notifications rate may be a reasonable proxy for incidence—especially in so far as levels and patterns of hepatitis C testing remained unchanged (DoHA, 2005, p 4).

The trend in the incidence of hepatitis C in young adults (as measured by notifications) is a marker for the change in the IDU population[11]. It follows that an arrest in the incidence of hepatitis C in young adults is likely evidence of a retardation or at least flat growth in the number of IDUs.

The annual growth of IDUs and the number of syringes in circulation are not affected in either the Base Case or under the optional scenarios, by the programs which are the subject of the evaluation, since their primary focus is on behavioural change. The source of syringe distribution, however, may change.

5.4 Base case epidemiology

Data on the demography of the IDU population and their use of syringes described above, in conjunction with data on the prevalence and incidence of hepatitis C and HIV in the Base Case will facilitate an estimation of the number of hepatitis C and HIV infections that are likely to occur under the *status quo* with all programs in place.

It is necessary to include HIV in the calculations because apart from HCEP, the programs are targeted HIV / AIDS strategies as well as hepatitis C. Moreover, all the programs have an impact on both infections. As it is hard to apportion the cost of the programs between the infections, the study thus accounts for the effect of the programs on both of hepatitis C and HIV / AIDS.

The spread of hepatitis C and HIV infections in any period of observation is a function of the new cases that occur amongst new IDUs and the new cases that develop amongst the existing stock of IDUs at risk (ie those IDUs not already infected). Drawing upon the findings of the Health Outcomes (op cit) study, a distinction is drawn between incidence amongst IDUs that use NSPs and those who do not use NSPs. The differential incidence is summarised in Table 13.

Table 13: Base Case incidence of infections

	1999/00 – 2004/05
Hepatitis C:	
NSP IDUs	18.5%
Non-NSP IDUs	24.7%
HIV / AIDS:	
NSP IDUs	0.028%
Non-NSP IDUS	0.054%

Source: Health Outcomes (op cit)

The lower incidence of hepatitis C and HIV when clients use NSPs reflects that they are more likely to use clean needles and to observe safer injecting techniques and reduce environmental blood spread than when clients do not use NSPs. In addition the literature suggests that NSP clients are more likely to observe safer syringe disposal practices than non-NSP clients (see Literature Review, Appendix 3). It is accordingly assumed that about 90% of syringes used by

[11] Personal communication with Dr Matthew Law, National Centre in HIV Epidemiology and Clinical Research, 4 May 2005.

NSP IDUs and about 50% of those used by non-NSP IDUs are disposed of appropriately. About 93% of IDU needle and syringe utilisation is associated with at least one type of NSP[12].

In the Base Case it is estimated during 1999/00 - 2004/05 that there were some 16,000 new cases of hepatitis C each year of which some 14,500 were attributable to IDUs and 1,400 to non-IDUs, assuming the latter to represent about 9% of all cases (ANCAHRD, 2002). There were also about 55 cases of HIV a year attributable to IDUs.

In addition the effect of the programs would cause 87% of needles and syringes to be appropriately disposed of.

5.5 Option A epidemiology

The effects of Option A are determined by projecting what could occur if all of the education, harm minimisation (including NSPs), counselling and referral services inherent in the five areas of expenditure described in section 3 were removed.

Removal of these programs would cause IDU behaviour to regress and the incidence of hepatitis C to increase. First, an absence of NSPs, following Health Outcomes (op cit), would cause the incidence of new infections for all those who were NSP IDUs in the Base Case to rise to at least the level of non-NSP IDUs as in Table 13 above. Second, as documented in Appendix 4, it is likely that the absence of HCEP and other complementary education and prevention programs could cause a further layer of regression.

The modelling allows for a lag between implementation of certain fixed cost programs (HCEP and the COAG components of NSPs) and realisation of their potential. It is thus assumed, as a central estimate, that these programs in conjunction with State and Territory Programs (previously in place) enhanced the impact of NSPs by 2.5% in 1999/00 (the year of their commencement) and 5% thereafter. These assumptions reflect that there were operational delays in implementing HCEP and some COAG programs, as described in section 3. In light of the qualitative evidence collected in the course of stakeholder consultations, the central assumption about the incremental support provided to NSPs from HCEP, COAG and from many non-NSP programs is plausible (see Appendix 4). These assumptions are tested for sensitivity below in section 5.10.

In terms of the model, the presence of all five sets of programs would thus cause avoidance of new infections measured by a higher incidence of hepatitis C and HIV / AIDS as set out in Table 14—which may be compared with the Base Case experience in Table 13.

Table 14: Impact of removing five prevention / education / harm reduction programs on incidence of infections

	1999/00	*2000/01 to 2004/05*
Hepatitis C:		
NSP IDUs	n/a	n/a
Non-NSP IDUs	25.3%	25.9%
HIV / AIDS:		
NSP IDUs	n/a	n/a
Non-NSP IDUS	0.056%	0.058%

[12] 93% "utilisation" refers to the ratio of needles and syringes (inferred from the modelling) distributed through one form of NSP or other; it does not mean that 93% of IDUs necessarily obtain all their needles and syringes from NSPs.

Under the Option A assumptions, it is estimated that incident cases of hepatitis C would have risen from some 16,000 to 20,000 – 22,000 each year from 1999/00 to 2004/05, of which some 19,000 – 20,000 would have been attributable to IDUs and about 1,900 to non-IDUs—assuming again, following ANCAHRD (2002), that the latter represent about 9% of all incident cases. The number of new HIV cases attributable to IDUs would have risen from about 50 to more than 100 a year.

Without the programs, the proportion of needles and syringes appropriately disposed of would have fallen from 87% to 49%—principally because in the absence of NSPs, the IDU population as a whole would have adopted non-NSP disposal practices. This result is consistent with the literature (Miller, 2001; Ksobiech, 2004).

Increases in infections and in the inappropriate disposal of syringes without the programs are another way of looking at the incremental reductions in infections and in the inappropriate disposal of needles and syringes that occur in the Base Case scenario as a result of the contribution of the programs to the Base Case.

5.6 Option B epidemiology

To determine the effects of Option B the study projects what could occur during the evaluation period if just HCEP were removed from the Base Case scenario.

There is less direct linkage between HCEP and reduced transmission of infections than the package of programs considered in relation to Option A. As remarked under section 3, most HCEP benefits result from the training of health care workers and education of people with hepatitis C. Reduced infections, however, may be expected from better client access to testing, treatment and counselling. There are no data on the extent of the impact of HCEP in reducing infections. As a central estimate, this study interprets the impact of HCEP in terms of a 0.5% enhancement of the services of NSPs during 1999/00 (the year of commencement) and 1% thereafter. This again allows for a lag between the implementation HCEP and its fuller impact between 2000/01 and 2004/05. Sensitivities for the impact of HCEP are provided in section 5.11 below.

On the central case assumptions, HCEP thus contributes to the avoidance of increases in new infections measured by a rise for NSP IDUs and non-NSP IDUs in the incidence of hepatitis C and HIV / AIDS as set out in Table 15—which may be compared with the Base Case experience in Table 13.

Table 15: Impact of removing HCEP on incidence of infections

	1999/00	*2000/01 to 2004/05*
Hepatitis C:		
NSP IDUs	18.6%	18.7%
Non-NSP IDUs	24.8%	25.0%
HIV / AIDS:		
NSP IDUs	0.0278%	0.0279%
Non-NSP IDUS	0.054%	0.055%

Under the Option B, it is estimated during 1999/00 - 2004/05 that cases of hepatitis C would consequently have risen by 80 to 160 over the Base Case, of which some 70 to 145 cases would have been attributable to IDUs and 10 to 15 to non-IDUs (assuming once more that the latter represent about 9% of all cases). New HIV cases attributable to IDUs would have risen by 1.

The model assumes that the effect of removing HCEP would exert a small influence (as a result of the loss of education and counselling) over the way in which needles and syringes are disposed of[13]. Without HCEP, the proportion of needles and syringes appropriately disposed of would thus have fallen from 87% to 84%.

Analogous to the remark in relation to the Option A scenario, the increase in infections without HCEP is another way of looking at the incremental reductions in infections and in the inappropriate disposal of needles and syringes that occur in the Base Case scenario as a result of the contribution of HCEP to the Base Case.

5.7 Economic contribution of programs under Option A

The incremental net dollar savings yielded by the programs covered under Option A can be measured by comparing their incremental cost with their incremental dollar benefits. First the unit costs for measuring the dollar benefits are specified.

Unit costs for measuring benefits of reduced morbidity and mortality from hepatitis C and HIV / AIDS under Option A

Unit costs of hepatitis C and HIV / AIDS consist of two components:

(1) The direct cost of treatment, mainly a cost to government, associated with the management of hepatitis C. From section 4, the discounted lifetime valuation for diagnosing and treating hepatitis C is $5,797 per case. Drawing on Butler (2003, Appendix G), the evaluation model allows a discounted lifetime treatment cost per case of $151,000 for treating HIV / AIDS (assuming in each case a 5% discount rate).

(2) The indirect cost arising from valuing what people might be willing to pay to avoid loss of quality of life or death or both arising from hepatitis C and HIV/AIDS. A case of hepatitis C gives rise to an average weighted loss of 0.18 DALYs and an average case of HIV / AIDS causes a loss of 12.8 DALYs (AIHW, 2004; Mathers et al, 1999). DALYs here include both loss of quality living and premature death. There is allowance for a willingness to pay figure of $2.5 million for loss of life (Abelson, 2003). This is equivalent to a valuation of a statistical life year at $108,000 (assuming a discount rate of 5% and an average survival of 40 years per life). It follows that individuals would be willing to pay $19,440 to avoid a hepatitis C infection (0.18 × $108,000) and about $1.4 million to avoid an HIV/AIDS infection (12.8 × $108,000).

Unit costs for measuring benefits of better disposal of needles and syringes under Option A

The programs can be expected to reduce the number of inappropriately discarded needles and thereby injuries and collection costs.

Possible benefits of accidental injuries as a result of fewer inappropriately discarded needles are incorporated by assuming an injury rate of 1.94 per 10,000 inappropriately discarded needles (Applied Economics, 2005).

The evaluation allows for a health care service cost of $1,000 per needle stick injury (Applied Economics, 2005). This includes assessment of injury, counselling, medication and tests. The

[13] As advised by the Hepatitis C Section, Targeted Prevention Programs Branch, DoHA.

evaluation also allows a notional $500 for willingness to pay to avoid a needle stick injury. Following Thompson et al (2003), the infection risk from inappropriately discarded needles and syringes in public places of any blood borne viruses is infinitesimally small. Thus there are zero savings associated with lower infectious accidental injury.

Clean up costs were allowed for appropriately discarded needles and syringes of 0.20¢ each and for those inappropriately discarded, 0.30¢ each (Applied Economics, 2005).

Calculation of benefits under Option A

Appendix 1 tabulates the benefits from the package of programs covered under Option A and compares them with the costs of the programs. The main results under the central assumptions of the model are summarised in Table 16, discounted back to 1999/00 at 5%.

More than 95% of benefits are likely to accrue from reduced infections associated with IDU needle and syringe utilisation behaviour and the increasing recognition and interception of persons at risk. The remainder of the benefit is from a reduction in the number of inappropriately discarded needles and syringes.

The central estimate of the discounted total gross benefit of all programs is represented by the sum of the series of savings from morbidity and mortality, needlestick injuries and collection costs, which amount to $1,152.5m. This follows from:

- multiplying the number of projected incident cases of hepatitis C and HIV / AIDS avoided between 1999/00 – 2004/05 (29,211 and 253, respectively) by their health care and willingness to pay costs per case ($5,797 and $151,000 respectively for hepatitis C and HIV / AIDS lifetime treatment costs and $19,440 and $1.4m for their willingness to pay costs); plus

- the reduction in the number of needles and syringes inappropriately discarded during the same period, multiplied by their unit collection cost and the reduction in the number of injuries by the cost per injury.

Subtracting the discounted sum of annual expenditures on the programs between 1999/00 – 2004/05 ($233.8m, the discounted value of $227.6m in Table 9) from gross benefit ($1,152.5m), yields a discounted total net benefit of $918.7m (ie including savings from all sources). If savings attributable to HIV / AIDS and inappropriate syringe disposal are excluded, net benefit attributable to hepatitis C alone would be $503.4m ($737.2m savings from hepatitis C cases avoided minus the $233.8m total cost of programs). These figures represent the central estimate of the net dollar contribution of all of the Option A programs to the Base Case outcome.

About 80% of the total net benefit is a private benefit associated with what individuals could be willing to pay to gain healthy years of living. The other part of the net benefit is the saving in treatment costs and needlestick and accidental injuries, for which Government would otherwise pay (which together amount to $234.2m). This saving is sufficient to just offset the cost of the programs ($233.8m), resulting in a small net benefit to Government of $0.4m.

In cost-effectiveness terms, the net cost per incident case of hepatitis C avoided is $2,208[14]. The latter figure may be interpreted as saying that in contributing to the Base Case outcome, the programs incur a net discounted cost of $2,208 per hepatitis C case avoided.

[14] From Appendix 1: ($233.8m - $169.3m) ÷ 29,211 = the cost of the programs minus hepatitis C health care costs incurred divided by incident cases of hepatitis C avoided.

The net cost per DALY averted attributable to hepatitis C avoided is $12,266[15]. This represents the cost utility measure of the efficiency of the programs in contributing to the Base Case outcome.

Table 16: Main results under central assumptions of modelling the incremental contribution of the package of all preventive & education programs & NSPs under Option A to the Base Case, 1999/00 – 2004/05 in 2004/05 prices

INDICATOR OF ECONOMIC OUTCOME	Total, 1999/00 – 2004/05, discounted back to 1999/00 @ 5%	METHOD OF CALCULATION
Cost of programs ($m)	233.8	Discounted sum of cost of 5 programs described in section 3 & summarised in Table 9.
Incident cases of hepatitis C avoided (No)	29,211	(Reduction in hepatitis C incidence) × (No of IDUs at risk of hepatitis C infection).
Incident cases of HIV avoided (No)	253	(Reduction in HIV incidence) × (No of IDUs at risk of hepatitis C infection).
Gross benefit contribution of all programs to Base Case ($m)	1,152.5	Treatment & WTP cost [=benefit] of hepatitis C + HIV cases avoided + cost [=benefit] of inappropriate syringe disposal avoided.
Gross saving to Government ($m)	234.2	Treatment cost [=benefit] of hepatitis C + HIV cases avoided + cost [=benefit] of inappropriate syringe disposal avoided.
Net contribution to Government saving (hepatitis C + HIV / AIDS) ($m)	0.4	(Treatment cost [=benefit] of hepatitis C + HIV cases avoided + cost [=benefit] of inappropriate syringe disposal avoided) *minus* (Discounted sum of cost of 5 programs described in section 3 & summarised in Table 9).
Total contribution to net benefit (hepatitis C + HIV / AIDS) of all programs ($m)	918.7	(Treatment & WTP cost [=benefit] of hepatitis C + HIV cases avoided + cost [=benefit] of inappropriate syringe disposal avoided) *minus* (Discounted sum of cost of 5 programs described in section 3 & summarised in Table 9)
Total contribution to net benefit (hepatitis C only) of all programs ($m)	503.4	(Treatment & WTP cost [=benefit] of hepatitis C cases avoided) *minus* (Discounted sum of cost of 5 programs described in section 3 & summarised in Table 9).
Net cost per case of hepatitis C avoided ($s)	2,208	(Cost of 5 programs *minus* hepatitis C health care costs incurred) ÷ (Incident cases of hepatitis C avoided).
Net cost per DALY averted attributable to hepatitis C ($s)	12,266	(Cost of 5 programs *minus* hepatitis C health are costs incurred) ÷ (DALYs attributable to hepatitis C cases averted).

Source: Appendix 1

[15] From Appendix 1: ($233.8m - $169.3m) ÷ 5,258 = the cost of the programs minus hepatitis C health care costs incurred divided by DALYs attributable to hepatitis C cases averted.

5.8 Economic contribution of programs under Option B

The incremental net dollar savings yielded by HCEP under Option B can be measured by similarly comparing its cost with its incremental dollar benefit. The results are tabulated in Appendix 2.

Unit costs for measuring benefits under Option B

In accounting for lifetime treatment and willingness to pay costs, the same values for unit costs are used as those employed for the purposes of Option A ($5,797 and $151,000 respectively for hepatitis C and HIV / AIDS lifetime treatment costs and $19,440 and $1.4m for their willingness to pay costs).

Calculation of benefits under Option B

As for Option A, most benefits accrue from reducing the spread of infection. There is also a small benefit from better needle and syringe disposal practices. The tabulation in Appendix 2 again relies on the assumptions of the model and compares its costs and benefits. The main results are summarised in Table 17.

The central estimate of discounted gross benefit is $22.3m—again obtained from:

- the number of incident cases of each infection avoided between 1999/00 – 2004/05 multiplied by their respective costs per case (727 hepatitis C cases × [$5,797 + $19,440] + 2 HIV / AIDS cases × ($151,000 + $1.4m); plus

- the reduction in the number of needles and syringes inappropriately discarded during the same period, multiplied by their unit collection cost and the reduction in the number of injuries by the cost per injury.

The cost of HCEP is the discounted sum of annual expenditures incurred between 1999/00 – 2004/05, which amounted to $16.8m (the discounted value of $20.1m in Table 2). Subtracting benefits from costs leaves a net benefit of $5.5m. If savings attributable to HIV / AIDS and inappropriate needle and syringe disposal are excluded, net benefit exclusively attributable to hepatitis C would reduce to $1.5m.

As more than 70% of total net benefit derives from private willingness to pay benefits, there is a negative net benefit to Government of -$12.0m. Savings in expenditure on treatment costs alone are thus insufficient to recoup the $16.8m cost of the program.

In contributing to the Base Case outcome, HCEP incurs a net discounted cost of $17,316[16] per incident case of hepatitis C avoided and a net discounted cost of $96,200[17] per DALY averted attributable to hepatitis C avoided.

[16] From Appendix 2: ($16.8m - $4.2m) ÷ 727 = program costs minus hepatitis C health care costs incurred divided by incident cases of hepatitis C avoided.
[17] From Appendix 2: ($16.8m - $4.2m) ÷ 131 = program costs minus health care costs incurred divided by DALYs attributable to hepatitis C cases averted.

Table 17: Main results under central assumptions of modelling the incremental contribution of HCEP under Option B to the Base Case, 1999/00 – 2004/05 in 2004/05 prices

INDICATOR OF ECONOMIC OUTCOME	Total, 1999/00 – 2004/05, discounted back to 1999/00 @ 5%	METHOD OF CALCULATION
Cost of HCEP ($m)	16.8	Discounted cost of HCEP as described in section 3 & summarised in Table 2.
Incident cases of hepatitis C avoided (No)	727	(Reduction in hepatitis C incidence) × (No of IDUs at risk of hepatitis C infection).
Incident cases of HIV avoided (No)	2	(Reduction in HIV incidence) × (No of IDUs at risk of hepatitis C infection).
Gross benefit contribution of HCEP to Base Case ($m)	22.3	Treatment & WTP cost [=benefit] of hepatitis C + HIV cases avoided + cost [=benefit] of inappropriate syringe disposal avoided.
Gross saving to Government ($m)	4.8	Treatment cost [=benefit] of hepatitis C + HIV cases avoided + cost [=benefit] of inappropriate syringe disposal avoided.
Net contribution to Government saving ($m)	-12.0	(Treatment cost [=benefit] of hepatitis C + HIV cases avoided + cost [=benefit] of inappropriate syringe disposal avoided) *minus* (Discounted cost of HCEP as described in section 3 & summarised in Table 2).
Total contribution to net benefit (hepatitis C + HIV / AIDS) of HCEP ($m)	5.5	(Treatment & WTP cost [=benefit] of hepatitis C + HIV cases avoided + cost [=benefit] of inappropriate syringe disposal avoided) *minus* (Discounted cost of HCEP as described in section 3 & summarised in Table 2).
Total contribution to net benefit (hepatitis C only) of HCEP ($m)	1.5	(Treatment & WTP cost [=benefit] of hepatitis C cases avoided) *minus* (Discounted sum of cost of HCEP as described in section 3 & summarised in Table 2).
Net cost per case of hepatitis C avoided ($s)	17,316	(Cost of HCEP *minus* hepatitis C health care costs incurred) ÷ (Incident cases of hepatitis C avoided)
Net cost per DALY averted attributable to hepatitis C ($s)	96,200	(Cost of HCEP *minus* hepatitis C health care costs incurred) ÷ (DALYs attributable to hepatitis C cases averted)

Source: Appendix 2

5.9 Comparison of Option A and B contributions to benefit

Under the assumptions of the model, the essential contribution of the programs is in inhibiting the spread of infection. In each case there is a much smaller contribution to benefit through effective syringe disposal.

The programs covered under each of the Options provide a positive return, but returns from the five programs in Option A are greater. Every dollar spent on the NSP, prevention and education package, for instance, yields about $4.93 in benefit, (total net benefit of $1,152.5m ÷ total cost of all programs at $233.8m); whereas a dollar spent on HCEP yields a benefit of about $1.33 (total net benefit of $22.3m ÷ total cost of all programs at $16.8m). Option A's cost-effectiveness and cost utility ratios also score more favourably than Option B's by a factor of nearly eight.

The impact of the programs in securing gross savings from incident cases of hepatitis C avoided are much greater than they are for from savings from HIV / AIDS.

In the case of Option A, the contribution of hepatitis C to Base Case savings is $737.2m compared with $388.7m for HIV / AIDS; in the case of Option B (HCEP) the contribution of hepatitis C to Base Case savings is $18.3m compared with $3.8m for HIV / AIDS. For Option A, savings in hepatitis C thus contribute about 64% to gross savings ($737.2m ÷ $1,152.5m) and 82% in the case of Option B ($18.3m ÷ $22.3m). If therefore the entire overhead cost of all of the programs were attributed to hepatitis C (even though many of the programs in fact were a response to HIV / AIDS), the marginal benefit from gross savings in HIV / AIDS would become of some consequence (ie 'cream on the top'). At the margin (ie after savings from hepatitis C had paid for the overhead), about 42% ($388.7m ÷ $918.7m) of total net benefit under Option A would come from savings in cases of HIV / AIDS averted; and in the case of Option B, the marginal contribution of HIV / AIDS to total net benefit would be about 69% ($3.8m ÷ $5.5m)[18].

Whereas the benefits yielded by programs covered under Option A are sufficient to cover the treatment costs incurred by Government, in the case of HCEP there is a net loss to Government.

5.10 Sensitivity for Option A program contributions to benefits

The results of the model, as summarised in previous sections, rely on the values of its parameters and the discount rate. The usual practice in economic evaluation is to employ a discount rate of 7% (Department of Finance, 1991). In the health area a discount rate of 5% is more usual, as many years often elapse before investments in health are effectively realised. High discount rates can jeopardise returns on projects which are slow to gestate. Many public health practitioners and some health economists in fact advocate a zero discount rate (Parsonage and Newberger, 1992).

The central assumptions rely on a conventional 5% discount rate. Table 18 summarises results of key indicators of economic outcomes and also allows for discount rates of 0%, 3% and 7% for the years in which costs and benefits accrue[19]. Because the time horizon of the evaluation is a relatively short six years, the results are not highly sensitive to changes in the discount rate and the changes do not affect the sign of the key results (even though it includes health effects and treatment cost savings outside the six years).

Sensitivity for the main driver of the contribution to economic benefit in the Base Case is now considered (Table 18). Following the finding of Health Outcomes (op cit), a hepatitis C incidence rate for NSP IDUs that is considerably below that for non-NSP IDUs has been

[18] Conversely, if the entire overhead were to be carried by HIV / AIDS and the contribution from hepatitis C were, for example, ignored, total net benefit would be much lower in the case of Option A ($154.9m = $388m - $233.8m) and negative in the case of Option B (-$13.0m = $3.8m – 16.8m).
[19] The 5% rate used to discount unit treatment and private willingness to pay costs is held constant.

adopted (24.7% versus 18.5%). Under the Option A counterfactual, there are no NSPs and the benefit of their lower incidence rate is lost for hepatitis C, plus a further margin of reduction attributable to additional layers of training education, referral, etc. The latter is 2.5% in 1999/00 and 5% thereafter (see Tables 13 and 14 above).

The extent of the differential incidence of hepatitis C which Health Outcomes (op cit) find between NSP and non-NSP IDUs could be criticised because it does not appear to control for the influence of programs other than NSPs. It is thus possible that the difference between NSP and non-NSP incidence may in any case by default include a built in margin for education and prevention programs other than NSPs.

Table 18: Sensitivity results for contributions to Base Case under Option A, 2004/05 prices

DESCRIPTION OF SENSITIVITY	Net benefit, hepatitis C + HIV $m	Net benefit, hepatitis C $m	Net cost per case hepatitis C avoided $	Net cost per hepatitis C DALY averted $	Net saving to Gov't $m
Central case assumptions @ 0% discount	1,088.8	596.8	2,215	12,303	0.1
Central case assumptions @ 3% discount	981.5	537.9	2,211	12,281	0.3
Central case assumptions @ 5% discount*	**918.7**	**503.4**	**2,208**	**12,266**	**0.4**
Central case assumptions @ 7% discount	861.8	472.2	2,205	12,252	0.5
Zero additional contribution of programs to reduction of disease incidence rate over & above the NSP / non-NSP incidence differential (not 2.5 % in 1999/00 & 5% thereafter)—@5% discount	763.8	383.6	3,760	20,891	-30.6
Zero additional contribution of programs to reduction of incident disease rate over & above the NSP / non-NSP incidence differential in 1999/00 and 2.5% thereafter (not 2.5 % in 1999/00 & 5% thereafter)—@5% discount	779.4	383.6	3,577	19,872	-27.4
Ratio of NSP to total needle & syringe utilisation in the Base Case is 84% (not 93.3%, ie less 10%) —@5% discount	831.0	453.7	2,490	13,831	-7.8
Ratio of non-IDU to IDU hepatitis C is 12% (not 9%, ie plus 33.3%)—@5% discount	943.8	528.5	1,944	10,800	6.2

* Central case assumptions / central rate of discount

The study thus allows for the possibility that the central assumptions might overstate the contribution of other programs. Table 18 shows that with a zero additional allowance for the impact of other programs on hepatitis C and HIV / AIDS, the discounted net benefit contribution to the Base Case (at 5%) would fall by about 17% from $918.7m to $763.8m and net savings to Government would reduce from a breakeven situation to -$30.6m. If the 'other program margin' were reduced to zero in 1999/00 and to 2.5% thereafter, net total benefit would fall 15% to $779.4m and net savings to Government would reduce to -$27.4m. Net benefit attributable to savings in hepatitis C cases avoided would fall from $472.2m to $383.6m.

Next, consideration is given to the significance of changing the proportion of IDUs that participate in NSPs. Given the importance of the contribution of NSP behaviour, it is not surprising to find that results of the contribution of Option A programs are sensitive to the ratio of NSP to non-NSP needle and syringe utilisation. The central case assumption is that 93.3% of needle and syringe utilisation is associated with NSPs. If in the Base Case this ratio were say 10% lower, at 84%, it would affect both costs and benefits. A fall in the share of NSP needle and syringe coverage would reduce the Base Case cost of the programs because of savings in syringes and their distribution costs. Option A infections would not be affected by the resultant lower NSP coverage (because under the Option A counterfactual, only non-NSP needles and syringes would be available). However lower coverage would be associated with more sharing and hence increased incident infections in the Base Case scenario—because the contribution of the programs to their avoidance would be smaller. The resultant decline in benefit ($99.7m) would be greater than the fall in program costs ($12.0m), but total net benefit would remain positive. Over the years 1999/00 – 2004/05, reduced NSP coverage would thus be responsible for reducing the central case contribution of all of the programs to total net benefit from $918.7m to $831.0m and the contribution of hepatitis C cases avoided from a net benefit of $503.4 to $453.7.

Following ANCAHRD (2002), the modelling assumes that the ratio of the incidence of non-IDU hepatitis C to IDU hepatitis C remains at about 9%. Net benefit is sensitive to this ratio. Although a higher ratio of non-IDU infections would create a larger pool of new infections, it would not adversely affect the viability of the programs under the Option A scenario. Given the population of IDUs and their needle and syringe behaviour, a larger number of hepatitis C cases from other sources would enable the overhead of preventive expenditure to be more effectively recovered. Apart from some components of NSPs, the cost of the programs is fixed and invariant to the scale of operations. Increasing the non-IDU ratio of hepatitis C cases by say a third, from 9% to 12%, for instance, could thus increase incident cases of hepatitis C cases avoided by about 1,000 a year. As shown in Table 18, net contribution to benefit would hence increase from $918.7m in the central case to $943.8m; and net savings to Government would increase from a breakeven situation to $6.2m. Incident cases of HIV / AIDS would remain unaffected.

5.11 Sensitivity for Option B program contributions to benefits

Table 19 shows that the results of modelling the impact of HCEP's contribution to the Base Case are also not especially sensitive to variations in the discount rate. As in the case of the Option A scenario, changes do not affect the sign of the result.

It can be shown that the layer of advantage that HCEP contributes to the Base Case net benefit is highly sensitive to assumptions that are made about the extent of incident infections it avoids. Infections avoided by HCEP are associated with fourfold change in the value of total net benefit and in excess of tenfold change in the value of net benefit attributable to hepatitis C.

For instance, increasing the contribution of HCEP by 10%—from 0.5% to 0.55% in 1999/00 and from 1.0% to 1.1% between 2000/01 – 2004/05—results in avoidance of an additional 72 cases of hepatitis C, in turn causing its contribution to total net benefit to increase from $5.5m to $7.7m (40%) and its contribution to net benefit attributable hepatitis C alone to increase from $1.5m to $3.4m (126%) (Table 19).

Table 19: Sensitivity results for contributions to Base Case under Option B, 2004/05 prices

DESCRIPTION OF SENSITIVITY	Net benefit, hepatitis C + HIV $m	Net benefit, hepatitis C $m	Net cost per case hepatitis C avoided $	Net cost per hepatitis C DALY averted $m	Net saving to Gov't $m
Central case assumptions @ 0% discount	6.7	1.9	17,251	95,839	-14.4
Central case assumptions @ 3% discount	6.4	1.7	17,291	96,059	-12.8
Central case assumptions @ 5% discount*	**5.5**	**1.5**	**17,316**	**96,200**	**-12.0**
Central case assumptions @ 7% discount	5.2	1.4	17,340	96,336	-11.3
Contribution of HCEP to reduction of incident disease over & above the NSP / non-NSP incidence differential in 1999/00 *increases* to 0.55% and 1.1% thereafter (not 0.5% in 1999/00 & 1% thereafter, ie plus 10%)—@5% discount	7.7	3.4	15,215	84,527	-11.6
Contribution of HCEP to reduction of incident disease over & above the NSP / non-NSP incidence differential in 1999/00 *reduces* to 0.45% and 0.9% thereafter (not 0.5% in 1999/00 & 1% thereafter, ie less 10%)—@5% discount	3.3	-0.3	19,884	110,467	-12.5
Ratio of non-IDU to IDU hepatitis C is 12% (not 9%, ie plus 33.3%)—@5% discount	6.2	2.2	16,554	91,967	-11.9
Ratio of NSP to total needle & syringe utilisation is 84% (not 93.3%,ie less 10%) in both the Base Case and the Option B scenario—@5% discount	6.5	2.1	16,630	92,390	-11.8

* Central case assumptions / central rate of discount

Conversely, reducing the contribution of HCEP by 10%—from 0.5% to 0.45% in 1999/00 and from 1.0% to 0.9% between 2000/01 – 2004/05—causes the incidence of hepatitis C to rise by 72 cases, in turn causing its contribution to total net benefit to reduce from $5.5m to $3.3m (40%) and its contribution to net benefit attributable hepatitis C alone to reduce from $1.5m to -$0.3m (120%). In this instance, moreover, were it not for the $3.4m saving from HIV / AIDS, overall gross savings ($20.1m) would have been insufficient to cover the cost of HCEP and would have resulted in a total net benefit of -$0.1m[20].

A sensitivity for increasing the ratio of non-NSP incident cases of hepatitis C by a third from 9% to 12% would create a larger pool of new infection—as in the case of the Option A scenario. This could enable more effective use of a fixed cost program such as HCEP. As more incident cases of hepatitis would consequently be avoided, net contribution to benefit would increase from $5.5m to $6.2m.

The effect of changing the ratio of NSP coverage on HCEP's contribution to the Base Case, however, differs markedly from the Option A scenario. Changing the ratio of NSP coverage does not affect program costs (since HCEP is a fixed cost), but it would affect the number of

[20] ($20.1m - $3.4m) = a net benefit of $16.7m relative to a total HCEP cost of $16.8m.

incident cases of hepatitis C and HIV / AIDS in both the Base Case and in the Option B counterfactual (because both scenarios have NSPs). The outcome of reducing NSP utilisation by 10%—from 93.3% to 84.0%—would enable HCEP to cause a larger number of hepatitis C and HIV / AIDS infections to be avoided—even though the absolute number of incident cases were greater. In contrast to the experience under Option A, the incremental contribution of HCEP to Base Case avoidance of incident cases of hepatitis C and HIV / AIDS cases would thus be the larger, the lower the extent of NSP utilisation[21]. The total incremental contribution of HCEP to net benefit would thus increase from $5.5m with 93.3% NSP utilisation to $6.5m with 84.0% NSP utilisation (Table 19).

The sensitivity on NSP coverage provides information about the circumstances that are likely to maximise the contributions of an over arching, capacity-building program such as HCEP. It does not suggest that lower NSP coverage would increase benefits, but it does provide information about the context (lower NSP coverage) in which HCEP may be most effective.

6. Conclusion

If the model and its assumptions are a reasonable simulation of real world experience, it may be concluded that there are significant returns available from further investment in hepatitis C prevention, education and harm minimisation programs.

Under its central assumptions, the modelling suggests that the attainment of relatively modest changes in human behaviour may reduce incident cases of infection and contribute to better needle and syringe disposal. Allowing for sensitivities in the discount rate and various key parameters, the model suggests that the capacity of the programs to deliver benefits seems to be fairly robust.

The key results under the central assumptions may be summarised as follows for the evaluations undertaken with respect to each of Option A and B scenarios:

> In the case of the Option A scenario—which measured the incremental economic gain between 1999/00 – 2004/05 associated with HCEP, State and Territory hepatitis C initiatives and NSPs, including the COAG Supporting Measures—the net cost per incident case of hepatitis C avoided was $2,208, the net cost per DALY averted and attributable hepatitis C was $12,266 and total net benefit (with savings from HIV / AIDS and appropriative needle and syringe disposal included) was $918.7m; if savings only from hepatitis C are included, net benefit amounted to $503.4m. The major part of the net benefit was associated with a private gain based on what people would be willing to pay to avoid infections. The net benefit to Government, consisting of savings in treatment cost and appropriate needle and syringe disposal was $0.4m.

[21] The logic, under the assumptions of the model, is as follows: higher NSP utilisation (93.3%) would be associated with fewer incident cases of hepatitis C and HIV infection. In the case of hepatitis C under central case assumptions in the year 2004/05, for example, the contribution of HCEP reduces incident cases from 16,341 to 16,179. Lower NSP utilisation (84.0%), on the other hand, would be associated more incident cases. In the case of hepatitis C in 2004/05, the contribution of HCEP would reduce incident cases from 16,841 to 16,674. The incremental contribution of HCEP thus causes 162 cases to be avoided (16,341 minus 16,179) where NSPs coverage is 93.3% compared with the avoidance of 167 cases (16,841 minus 16,674) where NSP coverage is 84%. Incident cases avoided would be 3% greater in where NSP coverage were lower.

In the case of the Option B scenario—which measured the incremental economic gain between 1999/00 – 2004/05 associated simply with HCEP—the net cost per incident case of hepatitis C avoided was $17,316, the net cost per DALY avoided attributable hepatitis C was $96,200. Total net benefit was $5.5m; with savings only from hepatitis C included, net benefit amounted to $1.5m. The major part of the net benefit was again associated with a private gain based on what people would be willing to pay to avoid infections. The net benefit to Government, consisting of savings in treatment cost and appropriate needle and syringe disposal, was negative and amounted to -$12.0m.

The cost-benefit analysis shows that in terms of the savings attributable to hepatitis C alone, the programs under each of the scenarios are capable of recovering their expenditure outlays, although the money return available from the cluster of initiatives under Option A appears to be significantly greater than that available from the HCEP initiative under Option B. The efficiency with which returns are realised under each of Options A and B may be gauged from the values of the cost-effectiveness ratios. The relative values of returns under Options A and B suggest that the sum of the effects of the initiatives may be greater than the individual contributions of each constituent element.

The cost per DALY averted under Options A and B in this evaluation is comparable with the cost-effectiveness ratios of other public health programs in Australia. In 2003 Stone et al (2004) established a cost per DALY averted for biennial screening of faecal occult blood tests for 55 – 69 year-olds of $12,000 and for 50 – 69 year-olds of $24,000. Andrews (2005) found that mental health interventions yielded a cost per DALY averted of $20,000 for depression, $98,000 for substance abuse and $196,000 for schizophrenia.

Cost-effectiveness evidence is widely used in deciding public spending on health (such as the listing of drugs on the Pharmaceutical Benefits Scheme) but benchmarks for cost-effectiveness are not officially stated. The World Health Organization, however, distinguishes between interventions that are ‘cost-effective’ and those which are ‘very cost-effective’ (WHO, 2002).

‘Cost-effective’ interventions are defined as those that avert a DALY at between one to three times per capita GDP. In Australia in 2005 this would be equivalent to a cost per DALY averted of between $43,000 and $129,000. ‘Very cost-effective’ interventions avert a DALY at less than per capita GDP. In Australia this would be equivalent to a cost per DALY averted of less than $43,000.

In yielding savings from hepatitis C costing $12,266 per DALY averted, the 5 programs evaluated under Option A may thus be regarded as a ‘very cost-effective’ set of interventions. HCEP’s savings at a cost of $96,200 per DALY averted, on the other hand, would place it in the category of a ‘cost-effective’ intervention. These conclusions as to cost-effectiveness are not affected by the sensitivities considered in Tables 18 and 19.

APPENDIX 1

INCREMENTAL CONTRIBUTION TO BASE CASE OF OPTION A SCENARIO (PROGRAM PACKAGE, INCL. EDUCATION, PREVENTION & NSPs), CENTRAL ASSUMPTIONS AT 2004/05 PRICES

Incremental contribution to Base Case of Option A scenario (ie all education and prevention programs, including NSPs)	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total NPV, 0%	Total NPV, 3%	Total NPV, 5%	Total NPV, 7%
Incremental cost of all programs incurred in the Base Case:										
- Cost of NSPs, State / Territory funding, i.e incl PHOFA, excl. COAG ($m) [a]	23.2	23.4	23.6	23.9	24.1	24.4	142.6	128.6	120.4	113.0
- COAG, NSP diversification initiative ($m) [b]	2.9	3.3	4.1	3.9	4.0	4.0	22.1	19.9	18.5	17.4
- COAG, increased education, counselling and referral initiative ($m) [c]	3.1	5.1	5.6	5.4	5.5	5.4	30.1	27.0	25.2	23.6
Total Cost of NSPs ($m) [d]	29.1	31.9	33.3	33.3	33.5	33.8	194.8	175.5	164.2	154.0
Hepatitis C Education & Prevention Initiative (HCEP) ($m) [e]	1.7	3.9	3.6	3.8	3.5	3.5	20.1	18.0	16.8	15.7
State and Territory own purpose hepatitis C expenditure ($m) [f]	7.9	10.4	9.6	9.5	9.1	10.6	57.0	51.4	48.1	45.1
National Public Health Program base funding (NPHP) ($m) [g]	0.9	0.9	0.9	0.9	1.0	1.0	5.7	5.1	4.8	4.5
Total incremental cost of programs ($m) [h]	39.7	47.1	47.4	47.5	47.0	48.8	277.6	250.0	233.8	219.2
Incident cases of hepatitis C avoided (No) [i]	5,209	5,770	5,828	5,887	5,946	6,004	36,644	31,217	29,211	27,397
Incident cases of HIV / AIDS avoided (No) [j]	47	50	50	51	51	52	300	271	253	238
DALYs averted attributable to incident cases of hepatitis C avoided (No) [k]	938	1,039	1,049	1,060	1,070	1,081	6,236	5,619	5,258	4,931
DALYs averted attributable to incident cases of HIV / AIDS avoided (No) [l]	599	636	643	649	656	662	3,845	3,466	3,244	3,044
Benefits from reduced sharing / reuse of needles, hepatitis C ($m):										
Savings in health care costs [m]	27.5	30.4	30.7	31.1	31.4	31.7	182.8	164.7	154.1	144.5
Individual WTP (indirect) benefits [n]	92.2	102.1	103.1	104.1	105.2	106.2	612.9	552.2	516.8	484.7
Total benefits [o]	119.6	132.5	133.8	135.2	136.6	137.9	795.6	716.9	670.9	629.2
Benefits from reduced non-IDU incident morbidity, hepatitis C ($m):										
Savings in health care costs [p]	2.7	3.0	3.0	3.1	3.1	3.1	18.1	16.3	15.2	14.3
Individual WTP (indirect) benefits [q]	9.1	10.1	10.2	10.3	10.4	10.5	60.6	54.6	51.1	47.9
Total benefits [r]	11.8	13.1	13.2	13.4	13.5	13.6	78.7	70.9	66.3	62.2
Combined benefits from reduced hepatitis C incident morbidity ($m):										
Savings in health care costs [s]	30.2	33.4	33.8	34.1	34.5	34.8	200.8	181.0	169.3	158.8
Individual WTP (indirect) benefits [t]	101.3	112.2	113.3	114.4	115.6	116.7	673.5	606.9	567.9	532.6
Total benefits [u]	131.5	145.6	147.1	148.6	150.1	151.5	874.3	787.8	737.2	691.7
Benefits from reduced sharing / reuse of needles, HIV / AIDS ($m):										
Savings in health care costs [v]	7.1	7.5	7.6	7.7	7.7	7.8	45.3	40.9	38.3	35.9
Individual WTP (indirect) benefits [w]	64.7	68.7	69.4	70.1	70.8	71.5	415.2	374.3	350.4	328.7
Total benefits [x]	71.7	76.2	77.0	77.8	78.5	79.3	460.6	415.2	388.7	364.6
Benefits from reduced accidental incident needle stick injuries, ($m) [y]	3.8	3.9	3.9	3.9	4.0	4.0	23.5	21.2	19.8	18.6
Savings in needle & syringe collection costs, ($m) [z]	1.3	1.3	1.3	1.3	1.4	1.4	8.0	7.3	6.8	6.4
Total benefit of the contribution of all programs to Base Case, ($m) [aa]	208.3	227.0	229.3	231.6	233.9	236.2	1,366.4	1,231.5	1,152.5	1,081.0
Total saving to Government ($m) [bb]	42.4	46.1	46.6	47.1	47.5	48.0	277.7	250.3	234.2	219.7
Net cost per incident case of hepatitis C avoided, ($s) [cc]	1,823	2,359	2,344	2,266	2,115	2,339	2,215	2,211	2,208	2,205
Net cost per DALY gained attributable to incident cases of hepatitis C avoided, ($s) [dd]	10,126	13,105	13,025	12,589	11,748	12,993	12,303	12,281	12,266	12,251
Net contribution to Government saving ($m) [ee]	2.7	-0.9	-0.9	-0.4	0.5	-0.8	0.1	0.3	0.4	0.5
Total contribution to net benefit (hepatitis C + HIV / AIDS) of all programs, ($m) [ff]	168.6	179.9	181.8	184.1	186.9	187.4	1,088.8	981.5	918.7	861.8
Total contribution to net benefit (hepatitis C only) of all programs, ($m) [gg]	91.8	98.6	99.6	101.1	103.0	102.7	596.8	537.9	503.4	472.2

a	from Table 6
b	from Table 3
c	from Table 4
d	from Table 6
e	from Table 2
f	from Table 7
g	from Table 8
h	from Table 9
i	([Incidence of hepatitis C, Option A] × [No of IDUs at risk of hepatitis C, Option A]) - ([Incidence of hepatitis C, Base Case] × [No of IDUs at risk of hepatitis C, Base Case])
j	([Incidence of HIV/AIDS, Option A] × [No of IDUs at risk of HIV/AIDS, Option A]) - ([Incidence of HIV/AIDS, Base Case] × [No of IDUs at risk of HIV/AIDS, Base Case])
k	([DALY weight per case hepatitis C] × [No of IDUs at risk of hepatitis C, Option A]) - ([DALY weight per incid case hepatitis C] × [No of IDUs at risk of hepatitis C, Base Case])
l	([DALY weight per case HIV/AIDS] × [No of IDUs at risk of HIV/AIDS, Option A]) - ([DALY weight per incid case HIV/AIDS] × [No of IDUs at risk of HIV/AIDS, Base Case])
m	([Unit treatment cost of hepatitis C] × [No incident IDU cases of hepatitis C, Option A] - ([Unit treatment cost of hepatitis C] × [No incident IDU cases of hepatitis C, Base Case])
n	([Value of healthy life year × DALY weight per case hepatitis C] × [Incident IDU cases of hepatitis C, Option A]) - ([Value of healthy life year × DALY weight per case hepatitis C] × [Incident IDU cases of hepatitis C, Base Case])
o	m + n
p	([Unit treatment cost of hepatitis C] × [No incident non-IDU cases of hepatitis C, Option A] - ([Unit treatment cost of hepatitis C] × [No incident non-IDU cases of hepatitis C, Base Case])
q	([Value of healthy life year × DALY weight per case hepatitis C] × [Incident non-IDU cases of hepatitis C, Option A]) - ([Value of healthy life year × DALY weight per case hepatitis C] × [Incident non-IDU cases of hepatitis C, Base Case])
r	p + q
s	m + p
t	n + q
u	s + t
v	([Unit treatment cost of HIV/AIDS] × [No incident cases of HIV/AIDS, Option A] - ([Unit treatment cost of HIV/AIDS] × [No incident cases of HIV/AIDS, Base Case])
w	([Value of healthy life year × DALY weight per case HIV/AIDS] × [Incident cases of HIV/AIDS, Option A]) - ([Value of healthy life year × DALY weight per case HIV/AIDS] × [Incident cases of HIV/AIDS, Base Case])
x	v + w
y	(Unit cost of needlestick injuries × No incident community injuries, Option A) - (Unit cost of needlestick injuries × No incident community injuries, Base Case)
z	([Unit cost of appropriate n&s disposal × No n&s appropriately disposed of] + [Unit cost of inappropriate n&s disposal × No n&s inappropriately disposed of], Option A) - ([Unit cost of appropriate n&s disposal × No n&s appropriately disposed of] + [Unit cost of inappropriate n&s disposal × No n&s inappropriately disposed of], Base Case)
aa	u + x + y + z
bb	s + v + y + z
cc	([h – m] ÷ i) × 1,000,000; see also footnote 14
dd	([h – m] ÷ k) × 1,000,000; see also footnote 15
ee	bb – h
ff	aa – h
gg	u - h

APPENDIX 2

INCREMENTAL CONTRIBUTION TO BASE CASE OF OPTION B SCENARIO (HCEP), CENTRAL ASSUMPTIONS AT 2004/05 PRICES

Incremental contribution to Base Case of Option B scenario (ie only HCEP)	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total NPV, 0%	Total NPV, 3%	Total NPV, 5%	Total NPV, 7%
Incremental cost of HCEP incurred in the Base Case ($m) [a]	1.7	3.9	3.6	3.8	3.5	3.5	20.1	18.0	16.8	15.7
Incident cases of hepatitis C avoided (No) [b]	77	155	157	159	160	162	870	780	727	679
Incident cases of HIV / AIDS avoided (No) [c]	0	1	1	1	1	1	3	3	2	2
DALYs averted attributable to incident cases of hepatitis C avoided (No) [d]	14	28	28	29	29	29	157	140	131	122
DALYs averted attributable to incident cases of HIV / AIDS avoided (No) [e]	3	7	7	7	7	7	38	34	32	30
Benefits from reduced sharing / reuse of needles, hepatitis C ($m):										
Savings in health care costs [f]	0.4	0.8	0.8	0.8	0.8	0.9	4.5	4.1	3.8	3.6
Individual WTP (indirect) benefits [g]	1.4	2.8	2.8	2.8	2.8	2.9	15.4	13.8	12.9	12.0
Total benefits h	1.8	3.6	3.6	3.6	3.7	3.7	20.0	17.9	16.7	15.6
Benefits from reduced non-IDU incident morbidity, hepatitis C ($m):										
Savings in health care costs [i]	0.0	0.1	0.1	0.1	0.1	0.1	0.5	0.4	0.4	0.4
Individual WTP (indirect) benefits [j]	0.1	0.3	0.3	0.3	0.3	0.3	1.5	1.4	1.3	1.2
Total benefits [k]	0.2	0.4	0.4	0.4	0.4	0.4	2.0	1.8	1.7	1.5
Combined benefits from reduced hepatitis C incident morbidity ($m):										
Savings in health care costs [l]	0.4	0.9	0.9	0.9	0.9	0.9	5.0	4.5	4.2	3.9
Individual WTP (indirect) benefits [m]	1.5	3.0	3.1	3.1	3.1	3.1	16.9	15.2	14.1	13.2
Total benefits [n]	1.9	3.9	4.0	4.0	4.0	4.1	22.0	19.7	18.3	17.1
Benefits from reduced sharing / reuse of needles, HIV / AIDS ($m):										
Savings in health care costs [o]	0.0	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.4	0.4
Individual WTP (indirect) benefits [p]	0.4	0.7	0.7	0.7	0.8	0.8	4.1	4.1	3.4	3.2
Total benefits [q]	0.4	0.8	0.8	0.8	0.8	0.8	4.6	4.6	3.8	3.6
Benefits from reduced accidental incident needle stick injuries, ($m) [r]	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1
Savings in needle & syringe collection costs, ($m) [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Total benefit of the contribution of HCEP to Base Case, ($m) [t]	2.4	4.8	4.8	4.9	4.9	5.0	26.7	24.4	22.3	20.9
Total saving to Government ($m) [u]	0.5	1.0	1.0	1.0	1.0	1.1	5.7	5.2	4.8	4.5
Net cost per incident case of hepatitis C avoided, ($s) [v]	16,760	19,275	17,350	18,183	15,789	15,978	17,251	17,291	17,316	17,340
Net cost per DALY gained attributable to incident cases of hepatitis C avoided, ($s) [w]	93,111	107,085	96,387	101,015	87,719	88,766	95,839	96,059	96,200	96,336
Net contribution to Government saving ($m) [x]	-1.2	-2.9	-2.6	-2.8	-2.4	-2.5	-14.4	-12.8	-12.0	-11.3
Total contribution to net benefit (hepatitis C + HIV / AIDS) of HCEP, ($m) [y]	0.6	0.9	1.2	1.1	1.5	1.4	6.7	6.4	5.5	5.2
Total contribution to net benefit (hepatitis C only) of HCEP, ($m) [z]	0.2	0.0	0.3	0.2	0.6	0.6	1.9	1.7	1.5	1.4

a	from Table 2
b	([Incidence of hepatitis C, Option B] × [No of IDUs at risk of hepatitis C, Option B]) - ([Incidence of hepatitis C, Base Case] × [No of IDUs at risk of hepatitis C, Base Case])
c	([Incidence of HIV/AIDS, Option B] × [No of IDUs at risk of HIV/AIDS, Option B]) - ([Incidence of HIV/AIDS, Base Case] × [No of IDUs at risk of HIV/AIDS, Base Case])
d	([DALY weight per case hepatitis C] × [No of IDUs at risk of hepatitis C, Option B]) - ([DALY weight per incid case hepatitis C] × [No of IDUs at risk of hepatitis C, Base Case])
e	([DALY weight per case HIV/AIDS] × [No of IDUs at risk of HIV/AIDS, Option B]) - ([DALY weight per incid case HIV/AIDS] × [No of IDUs at risk of HIV/AIDS, Base Case])
f	([Unit treatment cost of hepatitis C] × [No incident IDU cases of hepatitis C, Option B] - ([Unit treatment cost of hepatitis C] × [No incident IDU cases of hepatitis C, Base Case])
g	([Value of healthy life year × DALY weight per case hepatitis C] × [Incident IDU cases of hepatitis C, Option B]) - ([Value of healthy life year × DALY weight per case hepatitis C] × [Incident IDU cases of hepatitis C, Base Case])
h	f + g
i	([Unit treatment cost of hepatitis C] × [No incident non-IDU cases of hepatitis C, Option B] - ([Unit treatment cost of hepatitis C] × [No incident non-IDU cases of hepatitis C, Base Case])
j	([Value of healthy life year × DALY weight per case hepatitis C] × [Incident non-IDU cases of hepatitis C, Option B]) - ([Value of healthy life year × DALY weight per case hepatitis C] × [Incident non-IDU cases of hepatitis C, Base Case])
k	i + j
l	f + i
m	g + j
n	l + m
o	([Unit treatment cost of HIV/AIDS] × [No incident cases of HIV/AIDS, Option B] - ([Unit treatment cost of HIV/AIDS] × [No incident cases of HIV/AIDS, Base Case])
p	([Value of healthy life year × DALY weight per case HIV/AIDS] × [Incident cases of HIV/AIDS, Option B]) - ([Value of healthy life year × DALY weight per case HIV/AIDS] × [Incident cases of HIV/AIDS, Base Case])
q	o + p
r	([Unit cost of needlestick injuries × No incident community injuries, Option B) - (Unit cost of needlestick injuries × No incident community injuries, Base Case)
s	([Unit cost of appropriate n&s disposal × No n&s appropriately disposed of] + [Unit cost of inappropriate n&s disposal × No n&s inappropriately disposed of], Option B) - ([Unit cost of appropriate n&s disposal × No n&s appropriately disposed of] + [Unit cost of inappropriate n&s disposal × No n&s inappropriately disposed of], Base Case)
t	n + q + r + s
u	l + o + v s
v	([a – l] ÷ b) × 1,000,000; see also footnote 16
w	([a – l] ÷ d) × 1,000,000; see also footnote 17
x	u - a
y	t - a
z	m - a

APPENDIX 3
LITERATURE REVIEW OF THE ECONOMIC ISSUES CONCERNED WITH HEPATITIS C

A1. Introduction

Hepatitis C is one of the most commonly notified communicable diseases in Australia. The Hepatitis C Virus Projections Working Group estimated that in 2001 there were some 16,000 incident cases of hepatitis C (ANCAHRD, 2002). This represented a 45% increase on the estimated 11,000 incident cases of hepatitis C in 1997 (Law and Batey, 1997). In 2003 an estimated 242,000 people living in Australia had been exposed to hepatitis C, of whom, 61,000 had cleared their infection, 174,000 were living with chronic hepatitis C and 7,500 had developed cirrhosis of the liver (ANCAHRD, 2002, quoted in NCHECR, 2004, p 192).

More than 90% of incident cases and some 80% of hepatitis C prevalence occurs amongst injecting drug users (IDUs) (ANCAHRD, 2002). Exposure to infected blood or blood products through the sharing or reuse of syringes and injecting equipment is the main source of hepatitis C transmission. Others in the population who may use or be exposed to un-sterile equipment for body piercing (eg tattooing, acupuncture, ear piercing, etc) are also at risk of infection. Transmission of the infection may also be associated with household blood-spread and, rarely, through sexual transmission (DHAC, 2000). As there is no vaccine to protect against hepatitis C, prevention is the most potent weapon against the disease.

In so far as IDUs constitute the only core group for the continued presence of the virus, if the epidemic is controlled among IDUs the virus will diminish; if not, the epidemic will continue (Crofts, 2001). There is often a close relationship between injecting drug use and crime. Many IDUs spend time in prison and high proportions of IDUs who were formerly prisoners report continuing injecting drug use after their release into the community (Black et al, 2004).

Recognising the increased prevalence of hepatitis C, in June 2000 the Australian Government launched a *National Hepatitis C Strategy, 1999/00 – 2003/04* (DHAC, 2000). A series of regional hepatitis C strategies were also released by State and Territory health authorities and by local health services within State and Territory jurisdictions.

The primary objectives of the 1999/00 – 2003/04 National Strategy were:

- to reduce the transmission of hepatitis C in Australia; and
- to minimise the personal and social impacts of hepatitis C infection.

The Strategy also outlined four priority areas for action, which were:

- reducing hepatitis C transmission in the community;
- treatment of hepatitis C infection;
- health maintenance, care and support for people affected by hepatitis C; and
- preventing discrimination and reducing stigma and isolation.

These general principles have now been reaffirmed by the second National Hepatitis C Strategy for 2005 – 2008, launched in June 2005 (DoHA, 2005).

A2. The case cost of hepatitis C

The economic benefits that flow from avoiding hepatitis C accrue largely from the incidence costs of each case avoided as a result of preventive programs. There are two types of case cost to be considered. First there are the direct treatment costs associated with the clinical management of patients. Under the Medicare environment in Australia, these are largely a cost to government. Second, there are the indirect production and quality of life losses.

A2.1 Treatment costs of hepatitis C

Hepatitis C is a chronic disease in which each case progress through various pathways over many years, therefore the case cost of treatment has been modelled by use of a Markov cohort approach (Brown and Crofts, 1998; Sheill, 1998; Sheill et al, 1999; Lidgren, 2004; ANCAHRD, 2002; Easton, 2002; Butler and Quinn, 2003). This approach simulates the natural history of the disease and its *sequelae* as a series of transitions through different health states over time. Persons in an initial cohort are allocated across different health states over time according to a set of transition probabilities at the end of each time period.

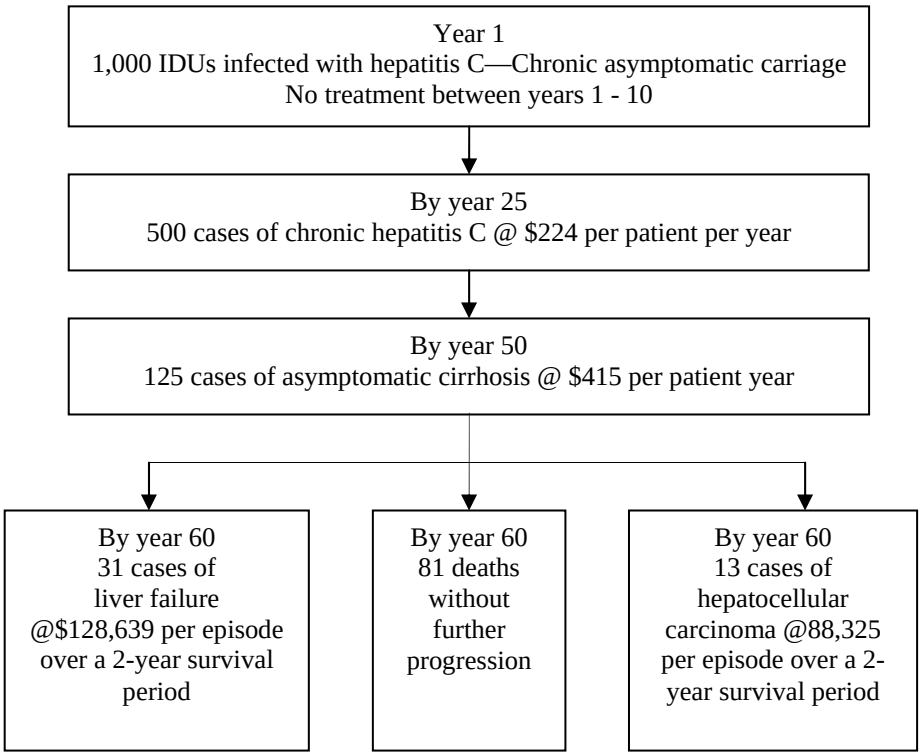
Brown and Crofts (1998) model the experience of a hypothetical cohort of 1,000 IDUs newly infected with hepatitis C over a 60 year period. The model is based upon assumptions derived from the medical literature about the risk factors of hepatitis C. The pathways of the model, with associated costs at 1994 prices, for each stage of treatment are schematically represented in Figure A1 from Brown and Crofts (1998).

During the first 10 years, members of the cohort do not receive any treatment. Many of them are likely to be identified as having 'no disease' because it remains benign, without symptoms. Although the latter do not incur health costs, they constitute a reservoir of infection and are likely to contribute to the spread of hepatitis C. Many of those in the initial hepatitis C carriage phase will recover spontaneously without treatment. By year 25, 50% of the cohort will have contracted chronic hepatitis C; by year 50, 25% of those with chronic hepatitis C will have developed cirrhosis; by year 60, 25% of those with cirrhosis will have developed liver failure (some of whom may receive a liver transplant) and 10% will have developed liver cancer (some of whom may receive surgery). Life expectancy with cirrhosis (even without progression to liver failure or to liver cancer) is no more than about 10 years.

The total cost of treating a cohort of 1,000 hepatitis C cases is the sum of the number of persons in each health state in each year throughout the experience of the cohort, multiplied by the annual case cost; for health states where a cost per episode is used (liver failure and liver cancer), the number of episodes is multiplied by the cost per episode (Brown and Crofts, 1998, Figure 1). The treatment cost per cohort is thus an undiscounted aggregation of the cost for all treatment years and episodes. For every 1,000 IDUs newly infected, Brown and Crofts (1998) calculated that there was a downstream $14.32 million in treatment expenditure as the *sequelae* become manifest. This is equivalent to an undiscounted (average) lifetime cost per case of $14,320 measured in terms of 1994 prices[22].

[22] i.e. $14.32 million ÷ 1,000,000 = $14,320

Figure A1: Hepatitis C progression between health states for a hypothetical cohort of 1,000 newly infected IDUs with associated dollar treatment costs at each level of progression at 1994 prices



Source: Brown and Crofts (1998)

Shiell (1998) develops a similar type of cohort model, projected over a period of 50 rather than 60 years, using a slightly different classification of disease states. Sheill estimates that the undiscounted lifetime cost per case of treating hepatitis C is $16,187 measured in terms of 1996 prices. Despite the differences in method and after allowing for price differences between 1994 and 1996, Sheill concludes that his results are similar to those of Brown and Crofts. Applying a 3% discount, Sheill estimates the present value of the lifetime treatment costs of hepatitis C to be $7,854 at 1996 prices.

Using a cohort model similar in structure to that developed by the Hepatitis C Projections Working Group (ANCAHRD, 2002), Butler and Quinn (2003) calculate the lifetime case cost of treating hepatitis C, relying in part upon data from Health Outcomes (op cit), Brown and Crofts (1998) and others, inflated to 1999/00 prices. The resulting undiscounted lifetime treatment cost is estimated to be $13,760. Discounted at 5% they are $4,384.

Part of the reason for the discrepancy between the discounted valuation of Butler and Quinn and the others is that Butler and Quinn's model runs for 84 years and the effect of the longer life of the model affects the discounted valuation. The earlier models, however, excluded the cost and effect of administering interferon alpha treatment—at that time of unproven value and introduced only in May 2000 as a benefit under the Pharmaceutical Benefit Scheme (PBS). This too may account in part for the lower case cost of Butler and Quinn. In November 2003 Combination therapy consisting of pegylated interferon and ribavirin became available on the PBS. This represented a significant treatment advance (Mann et al, 2001).

In a cohort model of the lifetime treatment costs of hepatitis C in New Zealand, using a cohort history similar to Brown and Croft (1998), Easton (2002) calculates the undiscounted case cost at 2001 prices to be $NZ24,500 or $NZ22,000 with interferon alpha treatment. Applied

Economics (2005) used a discounted lifetime case cost of hepatitis C treatment of $20,000 at 2004 prices[23].

A2.2 Indirect cost of hepatitis C

Intangible costs of hepatitis C may include lost workforce and household productivity, a reduction in years of life and diminished quality of life.

Based on the average age of people living with hepatitis C and median weekly earnings in 1996/97, Sheill (1998) estimates an undiscounted lifetime production loss of $33,600 or $17,500 discounted at 5%. Nevertheless Sheill is inclined to think that because of the low rates of employment amongst the biggest group of those infected by hepatitis C, the productivity method of valuing indirect losses could be an overstatement of the loss. Recent data on the demographic characteristics of IDUs in Australia confirm their low levels of employment (Treloar and Abelson, 2004).

The human capital approach to valuing indirect costs does not provide a basis for valuing the personal or emotional loss to individuals. To value these welfare costs, willingness-to-pay (WTP) measures are required. WTP measures are usually based in turn on severity measures for illnesses and dollar values attached to these severity measures.

As the basis for their cost-effectiveness / utility approach to valuation, Health Outcomes (op cit) adopt a series of cost weights derived from QALYs. These range from 0.94 (close to full health) for chronic hepatitis C that is undiagnosed to 0.74 for cirrhosis. Liver failure and liver cancer are respectively 0.32 and 0.10 (close to death). In their 'threshold' evaluation of the Hepatitis C Education and Prevention Initiative, Butler and Quinn (2003) use a weighted mean for "moderate chronic" hepatitis C of 0.85, which is based on the weights that Health Outcomes (op cit) use. The monetary loss to individuals from living with a loss of quality of life is the amount that they would be willing to pay to avoid the health loss or death. Cost weights may be applied for this purpose to discount the value to an individual of a year of full health (Applied Economics, 2003).

In their study of the burden of disease in Australia, Mathers et al (1999, Annex Table B) derive a series of cost weights for a large number of diseases based on DALYs, which are the converse of a QALY[24]. They ascribe a series of cost weights to hepatitis C ranging from 0.00 for asymptomatic hepatitis C (equivalent to full health) to 0.84 for cirrhosis (near death).

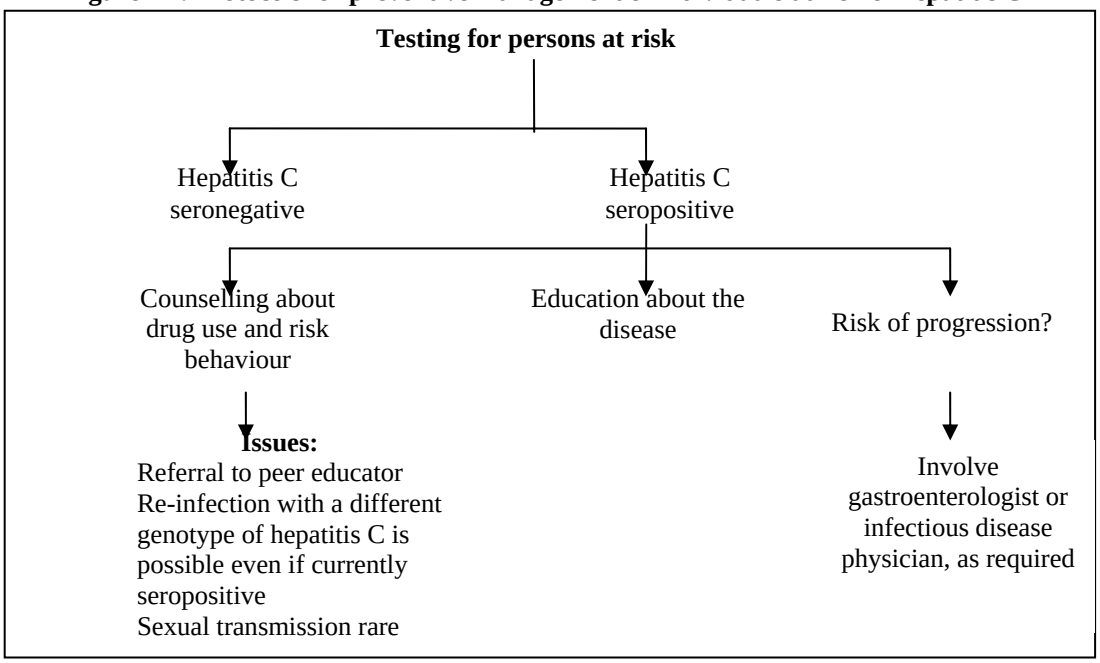
A3. Interception and prevention of hepatitis C

Preventive and education programs that seek to reduce the transmission of hepatitis C use a range of approaches including, public awareness, education, skill development, social marketing, community action creating supportive environments and policy development. They are designed to harmonise with one another to change attitudes, knowledge and behaviours so as to reduce the risk that people will begin using drugs in the first place, or use them in more harmful ways, such as by injection (Health Canada, 1989). They are also designed to encourage those who have become IDUs to seek counselling about their risk of hepatitis C, to encourage them to be tested, to make them become 'blood aware' and to alert them to the risks of needle and syringe reuse or sharing (Crofts, 2001).

[23] As advised by the Law Enforcement, Indigenous and Workforce Drug Strategy Branch.
[24] In a QALY a cost weight of 1 implies full health whereas 0 denotes death; in a DALY a cost weight of 1 implies death whereas 0 denotes full health

The starting point of any counselling and education program should be to encourage and maximise opportunities for the interception of persons at risk of hepatitis C (Crofts, 2001). These especially include all past and present IDUs and any person that has a past history of skin penetration. They should be offered testing for hepatitis C seroprevalence and depending on the test result, guided through appropriate education, counselling and treatment channels to safeguard their own health as well as that of others in the community. Figure 2 provides a template describing these.

Figure A2: Protocols for preventive management of individuals at risk of hepatitis C



Source: Crofts (2001)

Education and prevention programs are funded mainly by the Australian Government and work in conjunction with Non-Government Organisations and States and Territories including NSPs which are operated by the States and Territories. These different sets of interventions are likely to have synergistic effects. The former, for example, not only assist in the transmission of knowledge, they also assist in creating a context in which the effectiveness of NSPs is enhanced (Sheill, 1998).

The core services provided by NSPs aim to increase the number of syringes in circulation and encourage their return and safe disposal, so that each syringe is used fewer times, thereby reducing the chances of viral transmission. Alongside the distribution of sterile needles and syringes and the provision of arrangements for, and / or education about their safe disposal, NSPs also use contacts with IDUs, where possible, to increase their impact by:

- responding to IDUs with information and education—such as how best to disinfect used syringes/needles;
- providing easier access and referral to drug treatment, health and social services; and
- using outreach methods where possible (eg mobile vans) to make contact with hidden populations (Department of Health, 1996).

A4. Evaluation of prevention

Apart from the work of Butler and Quinn (2003) evaluating the conditions for a breakeven social return from the Australian Government's Hepatitis C Education and Prevention Initiative, there appears to be little economic information specifically about the impact of hepatitis C counselling and education programs in Australia or elsewhere. Observational studies seem to concentrate on reporting on NSPs and appear to do so without controlling the influence of other preventive interventions (WHO, 2005).

NSPs are widely credited with arresting and mitigating risky behaviour and in especially reducing the spread of HIV / AIDS amongst IDUs. (Hurley et al, 1996; Gibson et al, 2001; Health Outcomes op cit; Ksobiech, 2003; Kral et al, 2003; MacDonald et al, 2003). Evidence of the impact of NSPs on hepatitis C is not as strong or as persuasive as it is for HIV / AIDS.

In their comprehensive ecological analysis, Health Outcomes (op cit, Table 3.1.7) report on the impact of NSPs on hepatitis C for 27 time periods from nine countries, including for six cities in Australia. All cities studied possessed NSPs except for three in Italy. After aggregation for each city, hepatitis C incidence amongst IDUs was found to be 24.7 per 100 person years in cities without NSPs compared with 18.5 per 100 person years in cities with NSPs (Health Outcomes, op cit, Table 3.1.9)—although this protective effect was found to be non-statistically significant. The authors also acknowledge that it is not possible to separate the effects of implementing NSPs from other preventive and harm reduction strategies (Health Outcomes, op cit, p 15); they nevertheless feel that their study provides evidence that NSPs reduce the spread of hepatitis C infection (p 16).

Heath Outcomes (op cit) estimate that NSPs avoided 21,000 cases of hepatitis C in Australia during the period 1991 - 2000. The net present value, at a discount rate of 5%, of the benefit which thereby accrued was $13 million. This gain is calibrated as the value of the direct treatment costs avoided, net of the operating cost of NSPs. It does not allow for the cost of other prevention programs that might have contributed to the gain. The hepatitis C cases avoided during these years are shown to represent a gain, discounted at 5%, of 32,207 quality-adjusted life years. The latter is a physical measure of the private gain to individuals, as distinct from the dollar value of the financial savings to government.

As remarked above, Butler and Quinn (2003) consider the savings from the Hepatitis C Education and Prevention Initiative, but because of difficulties in interpreting data on the apparent incidence of hepatitis C during the term of the Initiative, they believe that it is inappropriate to attempt to develop a counterfactual to represent what might have occurred in the absence of the Initiative. The problem had to do with uncertainty about whether an apparent upward trend in the diagnosis of newly acquired hepatitis C reflected a rapid increase in incidence or a propensity to diagnose hepatitis C earlier.

Rather than employing a counterfactual to estimate the number of cases actually avoided, Butler and Quinn concentrated on estimating the number of cases that would need to be avoided if the Hepatitis C Education and Prevention Initiative were to return positive net benefits. They show that if the 114 projects funded under the Initiative reduce just 40 incident cases of hepatitis C per year it would deliver QALYs at a net cost (ie after meeting the cost of treatment) of $35,000 each. Valuing the 278 QALYS gained over the Initiative's first four years (1999/00 – 2002/03) at $60,000 each, causes the notional 40 cases avoided to yield a net benefit of some $7.0 million. Accordingly, Butler and Quinn claim that even relatively small contributions to avoidance of hepatitis C can be a worthwhile investment in a program such as the Hepatitis C Education and Prevention Initiative.

NSPs have been criticised in the international literature on the grounds that they may actually cause an increase in hepatitis C and HIV / AIDS. An outbreak of HIV in Vancouver, Canada in 1994, five years after the introduction of an NSP, led to studies claiming to show an independent association between the HIV prevalence and frequent NSP attendance (Strathdee et al, 1997). This left NSPs open to the allegation that they promote unsafe injecting behaviour and condone injecting drug use. One of the upshots was a ban on US federal funding of NSPs (ONDCP, 1998). However, a 1999 multivariate re-examination of the Vancouver time series data on HIV incidence (Schecter et al, 1999), while demonstrating a significantly elevated cumulative incidence among frequent NSP clients, also reported a range of confounders for the group (younger and more susceptible to unstable housing, incarceration, etc within the previous six months). Accounting for these confounders demonstrated no independent causal link between NSP attendance and HIV.

A more recent study of the Vancouver IDU data has since demonstrated a close association between hepatitis C prevalence and frequent attendance at NSPs (Patrick et al, 2001)— analogous to the earlier Strathdee et al (1997) study on HIV. In this study, however, no confounders were found to have been present, although the authors are cautious about the generalisability of its results.

Studies based on US and UK data suggest that whilst increasing the coverage of NSPs may be relevant to arresting risky behaviour, if they are not reinforced by comprehensive parallel education and harm reduction programs, they are unlikely by themselves to have an impact on hepatitis C incidence and prevalence (Pollack, 2001; Judd et al, 2005).

A5. Challenges for hepatitis C control

Various public health authorities in Australia have reflected on why NSPs have been relatively successful at limiting HIV infections among IDUs, but less successful in reducing the incidence and prevalence of hepatitis C (Crofts et al, 1999; Law and Batey, 2003). As remarked above, between 1997 and 2001 incident cases of hepatitis C in Australia rose by 45%. Various possible explanations advanced for this are summarised below.

The first is that hepatitis C is transmitted more easily through blood than HIV / AIDS and is acquired earlier after the onset of sharing injection materials (Crofts et al, 1999). Compared to HIV / AIDS, hepatitis C is ten to fifteen times more infectious through contact with blood (Heintges and Wands, 1997). The situation is further exacerbated by high prevalence of hepatitis C infection among populations that inject drugs, such that even occasional sharing of needles and other drug paraphernalia carries an extreme risk of infection (Crofts et al, 1999).

A second explanation is related to the considerably higher baseline prevalence of hepatitis C amongst IDUs (some 50-70%) when NSPs first commenced in Australia in 1987 (Health Outcomes, op cit). Hepatitis C was likely to have been endemic among IDUs, and thus more easily acquired, long before it had been formally identified in 1989 (Choo et al, 1989) and hence before there could have been widespread publicity about its infectiousness. In fact it seems likely to have first entered the IDU population in the mid-1960s, some 20 years before HIV / AIDS (Law and Batey, 2003). Thus rather than averting an epidemic, the task has been the harder challenge of attempting to reverse one already in train (Crofts et al 1999).

A third explanation is the rapid increase in the number of young people who inject drugs and the continued high incidence of hepatitis C among young, inexperienced people newly commencing injecting (Batey, 2002; Law and Batey, 2003). There is evidence of a low level of knowledge amongst young, new IDUs, including those who participate in NSPs, about the

extremely high risks of hepatitis C infection (Treloar and Abelson, 2004). Theoretically, sterile syringes and injecting equipment supplied through NSPs are 'information products' in the sense that they come with information about how they should be used and how drug referral services may be accessed, etc. In practice the transmission of this information is highly imperfect. Drug and alcohol workers are discouraged from opportunistic, pro-active interventions and are generally only able to respond when an IDU has approached them. This has deflected young, neophyte IDUs onto their own ineffective and inaccurate, informal social networks for information (Treloar and Abelson, 2004).

Hudoba et al (2003) describe results from an enhanced NSP in the Illawarra area of NSW that encourages staff to assertively engage clients. They claim this program has been successful in obtaining and returning needles and in increasing referrals to drug and alcohol services. Treloar and Abelson (2004) argue a case for a new peer education workforce that could operate on 'drug use scenes' and work in conjunction with NSPs and supervised injecting centres[25]. The provision of supervision and education to IDUs where they actually administer drugs is restricted to the Sydney Medically Supervised Injecting Centre, which opened in May 2001. This facility is the only one of its type in Australia (Kelly and Conigrave, 2002). Moreover, in contrast to the successful experience with HIV / AIDS (UNAIDS, 1999), and despite its acknowledgement in State and Territory and NGO strategic plans, peer education has not been widely used as a component of hepatitis C prevention programs.

A6. Disposal of needles and syringes

A by-product of injecting drug use is the proliferation of used injecting equipment discarded in public places, in turn creating a risk of accidental needle stick injury. The educational component of NSPs encourages IDUs to responsibly dispose of their equipment. NSPs have nevertheless been criticised because they are alleged to represent points of service that concentrate excessive quantities of discarded syringes in nearby public places (MacDonald et al, 1999). More generally, opponents of NSPs argue that provision of injecting equipment without charge does nothing more than increase the overall supply of needles, thereby increasing the number of contaminated needles in a community, accentuating biohazards for street cleaners and members of the public in general, but particularly for children playing in parks or beaches (Ksobiech, 2004). The associated clean up hence represents a public health cost.

In Australia, about 80% of needlestick injuries presenting to hospital emergency departments appear to involve health workers and originate in clinical settings (Gosporadevskaya et al, 2001). It is estimated that there are about 50 community needle stick injuries a month presenting to hospital emergency departments (Gosporadevskaya et al, 2001). There are also frequent reports of general practitioners being called upon to treat needle stick exposures[26], but no hard data are available on the scale of this experience. In 2000, the direct treatment cost per case was about $250 (Gosporadevskaya et al, 2001). On the other hand, Following Gosporadevskaya et al. (2001) and Thompson et al (2003), the infection risk from inappropriately discarded needles in public places of any blood borne viruses is infinitesimally small. Moreover there have been no reports in Australia of cases of infection as a result of a community injury (Thompson et al, 2003).

[25] For legal and occupational health and safety reasons, the outreach work of drug and alcohol workers does not at present extend to 'drug use scenes'.
[26] http://www.medicineau.net.au/clinical/sexualhealth/sexualhealth1.html

There is an indication that the scale and potential impact of the disposal problem in Australia may possibly have been exaggerated by people who are opposed to NSPs, particularly those residing in the vicinity of NSP points of service (MacDonald, 1999).

A meta analysis by Ksobiech (2004) of 26 different NSPs distributed across 14 countries reported on the number of syringes distributed and returned over varying periods of time. It found there was an overall return of 90%. Ksobiech concluded that supplying IDUs with clean syringes does not cause more 'dirty' syringes in a community and that there was "a relative balance between NSP syringes distributed and the number of syringes returned to NSPs". Hence the mere existence of NSPs does "not logically pose a health hazard to the general population" (Ksobiech, 2004).

Only one of the studies, however, reported return rates for Australia. This was for a very early pilot NSP in Sydney in 1986, where the return rate was 41% (Wolk et al, 1987). A more recent study of syringe return behaviour in Geelong, Victoria found that although the monthly return rate was just 30%, the vast majority of syringes provided through NSPs in the Barwon region were not inappropriately discarded and that call outs to attend to discarded syringes represented less than 1% of syringes provided (Miller, 2001).

A7. Summary and conclusions

The literature on hepatitis C provides good documentation on the spread of hepatitis C and its health consequences. It is an epidemic largely confined to the IDU population. Clients of body piercing operators are also at risk.

The treatment cost of hepatitis C and its *sequelae* is generally modelled with the aid of a Markov chain. Estimates of case costs may show considerable variation—for example, the estimate of Sheill (1998) of $16,187 at 1996 prices compares with the estimate of Butler and Quinn (2003) of $13,376 at 1999/00 prices. These variations are due to the underlying assumptions about the pathways and treatment of the disease. A capital cost can be derived by discounting the future costs to the present. Sheill (1998), for instance, estimated the lifetime treatment costs to be $7,854 and Butler and Quinn (2003) $4,384.

There is no vaccination for hepatitis C and other public health strategies for its prevention are essential for its control. The two main types of prevention are:

- those which concentrate on behavioural change by educating and training health professionals as well as targeting persons at risk to educate them about testing, treatment and risky behaviour; and
- those which, through NSPs, specifically target the avoidance or reduction of needle and syringe sharing and reuse; these concentrate on maximising the supply of sterile needles to IDUs in conjunction capturing opportunities, where possible, for counselling and referral of clients to health professionals.

Peer education has not been a central feature in promoting the adoption of preventive behaviour in regard to hepatitis C[27].

The prevention and control of hepatitis C has proved a considerably greater challenge than has been the experience with HIV /AIDS. The main reasons for this are that hepatitis C is much more infectious than HIV / AIDS; it was endemic before it was identified as a disease; and the uptake of injecting drug use is by young adults with an increasingly poor knowledge

[27] As advised by the Hepatitis C Section, Targeted Prevention Programs Branch, DoHA.

of the associated risks (community acceptance and therefore willingness to be open in discussing).

In contrast to HIV / AIDS, the prevalence and incidence of hepatitis C has grown rapidly. Although there is debate about the impact and effectiveness of harm reduction strategies, such as NSPs in particular, in controlling hepatitis C, this is not regarded as an argument against NSPs. It has rather become a case for the reinforcement, possibly through more pro-active and opportunistic approaches to engaging NSP clients and counselling them about risk awareness and referring them for testing.

Most formal economic evaluations of hepatitis C programs have concentrated on the effect of NSPs, without effectively controlling for the separate impact of concurrent / related education and counselling programs. In so far as education and prevention programs work in conjunction with NSPs, this is a problem which is difficult to avoid.

NSPs have been criticised because they cause costs associated with concentrations of discarded needles in public places. The evidence, however, suggests that NSPs in fact may assist in the appropriate disposal of needles and syringes.

Search terms

The literature review was assisted by the following search terms, used with Google and with various electronic databases, including IngentaConnect, Ovid, Ebsco Electronic Journals Service, Sage Collections, Taylor and Francis and Wiley Interscience:

Economics of HCV / hepatitis C
Cost-effectiveness AND HCV / hepatitis C
Cost-benefit / cost-benefit AND HCV / hepatitis C
Harm reduction
NSPs AND HCV / hepatitis C
HCV / hepatitis C AND prevention AND education

APPENDIX 4
SUMMARY OF STAKEHOLDER VIEWS FROM CONSULTATIONS, APRIL - MAY 2005

Background Information

As outlined elsewhere in this report, needle and syringe programs (NSPs), which are provided by the States and Territories, originated as a response to the threat of an epidemic of HIV / AIDS.

HCEP and the COAG Supporting Measures each have the core objectives of reducing transmission of blood borne diseases, reducing the personal and social impacts of disease on those affected and improving access to hepatitis C treatment, care and support services.

The Australian Government introduced the Hepatitis C Education and Prevention Initiative (HCEP) in 1999. This program provides funding to the States and Territories and national peak bodies to deliver education and prevention activities such as:

- training and educational resources for health professionals, including general practitioners, working in the hepatitis C area;
- production of a range of specialist and generalist publications and other information resources (including websites) to raise awareness about hepatitis C, its modes of transmission, the importance of testing and the treatment options;
- peer education activities;
- networking opportunities such as workshops and conferences; and
- awareness campaigns.

In 1999 the Council of Australian Governments (COAG) first introduced the Illicit Drug Diversion Package—Supporting Measures Relating to Needle and Syringe Programs. These Supporting Measures were continued for a further four years from 2003-04, providing funds for:

- increased education, counselling and referral services provided through community-based programs, including NSPs;
- training for health care workers in NGOs and community-based NSPs and recruitment of additional staff to provide the above services, and
- diversification of NSPs into pharmacies and other outlets, plus information and training support.

HCEP and the COAG initiatives, together with NSPs, are the key Australian State and Territory Government activities to reduce the transmission of blood borne viruses such as hepatitis C.

Focus of Consultations

Consultations were held with a selection of stakeholders, including State and Territory officials who administer hepatitis C programs, national non-government peak bodies funded by the Australian Government, the Intergovernmental Committee on AIDS, Hepatitis C and Related Diseases (IGCAHRD), the Ministerial Advisory Committee on AIDS, Sexual Health and Hepatitis (MACASHH) and various individual experts and specialists.

The consultations sought the views of these stakeholders on a range of issues including:

- their perceptions as to the usefulness of the programs;
- the adequacy of NSPs (including their geographic distribution and cultural accessibility);
- the likely impacts of the programs on hepatitis C incidence and prevalence;
- likely impacts if the programs were to cease;
- which improvements could be made if the programs were to continue; and
- other comments.

Overall usefulness of the programs

States and Territories consulted felt that HCEP and the COAG Supporting Measures were useful as they enabled them to undertake projects specifically directed to hepatitis C, and not to divert funding from projects addressing other infectious diseases, particularly blood borne viruses.

While the **peak NGOs** received funding only from HCEP, their national perspective also enabled them to comment on the COAG initiatives and NSPs. They welcomed programs specifically targeted at hepatitis C and which were separate from those targeted at other blood borne viruses such as HIV / AIDS. However they felt that hepatitis C programs needed to be ongoing, with expanded funding.

Similarly, **IGCAHRD** felt that the programs worked well, that they were an important investment in tackling hepatitis C and that the COAG funding in particular had augmented the capacity of NSPs.

Many respondents commented positively on how the programs had fostered partnerships between Government, NGOs and peer groups. They felt that these partnerships assisted the different groups to understand each other's perspectives and thus contributed to better services and better targeted information. Such partnerships also had the capacity to leverage the available funding.

Comments were received on the perceived strengths and weaknesses of HCEP and the COAG measures. These are summarised as follows:

HCEP strengths:

- There was general agreement by the States and Territories that HCEP funds enabled the provision of education and prevention activities which States could not by themselves sustain—especially innovative approaches and research activities. It has enabled collaboration and partnerships between organisations. Funded activities complemented those of the NSPs, and also had the potential to reach people who did not access NSPs. It was desirable to have a dedicated source of funds for hepatitis C.
- A particular strength mentioned was the ability to fund reputable national peak bodies, to work across jurisdictions, to retain committed staff and to collectively reach the key population and professional groups concerned with hepatitis C.
- The funding has enabled jurisdictions to maintain and build capacity in the non-government sector.

- Through ASHM's training programs on skill development for GPs, it has been possible to allow some GPs to participate in the management of their hepatitis C clients, via medications prescribed under s100 of the National Health Act. Other stakeholders were nevertheless pessimistic about the potential for involving GPs. It was commented that a GP pilot had failed to attract interest and support because of the limited appeal of IDUs as a clientele.
- Through MHAHS, HCEP has enabled the provision of educational and information resources to be targeted at CALD communities, and the ability to focus on people who had emigrated from countries which have a high prevalence of hepatitis C.
- Through the AHC—the capacity to develop high quality, nationally consistent educational resources and materials for the State-based educators who are training hepatitis C workers (including pharmacists) and managing the annual hepatitis C treatment awareness week.
- Through AIVL—producing appropriate materials and resources which are used in training peer educators, and assisting in their ability to reach IDUs who do not access NSPs.

HCEP weaknesses:

- All jurisdictions (and peak NGOs) commented on the tardy flow of funds at the beginning of the program's operation. This had adversely affected the smaller States where, because they could not continue to fund the projects without access to Australian Government funding and some NGO projects had to be abandoned with staff redundancies.
- The program has very detailed and onerous reporting requirements relative to its size. In this respect it rated poorly against COAG.
- The modest overall amount of funding means that the program has limited impact.

COAG strengths:

- The strength of COAG, in conjunction with NSPs, was seen in the provision of protective equipment to the high risk groups for hepatitis C, within a harm reduction framework. It has increased the capacity of NSPs to do their work more effectively, particularly in supporting community-based organisations and peer groups with training, educational resources and additional staff.
- For the smaller States, COAG funding represented a significant increase in resources for hepatitis C as it has enabled them to expand NSP services into new areas and to target hard-to-reach groups such as Aboriginal and Torres Strait Islander people and CALD communities. Some of the smaller States also remarked that COAG funding enabled them to purchase specific equipment for NSPs—swabs, spoons, water etc, which are vital in preventing infection.
- The COAG funding has also enabled jurisdictions to provide more disposal bins for syringes and initiate community clean-ups; these are seen as important strategies for reducing community concerns about NSPs.

COAG weaknesses:

- There were no significant weaknesses identified. Some jurisdictions, however, were concerned that funding for the program was non-recurrent, so that services had been unable to appoint permanent staff, or even in some cases unable to backfill while staff were on leave.
- It was regretted that the funds could not be used for a trial of vending machines or for capital works such as structural modifications to create separate entrances for NSP areas in hospitals or community health centres.
- One jurisdiction observed that COAG funds were insufficient to maintain a subsidised pharmacy program (subsidies had previously been provided via HIV / AIDS funding).
- Some jurisdictions commented that the administrative reporting requirements were time-consuming.

The adequacy of NSPs

The extent of services, their type and their geographic spread varies between States and Territories.

NSW reported that there is good State-wide coverage, with over 800 access points and a variety of service models—eg NGO-provided services, youth services, public hospital and community health centre services, pharmacies and vending machines. There are over 100 vending machines in more than 50 locations. The latter are seen as particularly cost-effective where there are few IDUs that cannot justify the cost of staff to run a service. A disadvantage with vending machines is that education and prevention messages are not available unless the machines are outside a hospital where a user can gain access to health staff. The ACT, however, is trialling the use of stickers with hepatitis C health messages on its fit packs dispensed from a syringe vending machine.

Most other jurisdictions also reported good geographic coverage, but with a smaller range of service models than NSW. They indicated it would be desirable to have more outlets, especially in rural towns, but there are constraints because of the wider community's lack of acceptance of NSPs.

All jurisdictions and the peak NGOs stressed the importance of cultural and environmental factors in determining the accessibility of NSPs. The main access problems identified were:

- most NGO-provided services (including mobile services) and pharmacies cease to operate after 9.00 PM;
- hospitals generally provide a 24-hour service, but some accident and emergency staff are not well disposed towards NSP clients and may be reluctant to supply them with equipment;
- confidentiality is a problem with NSPs in hospitals and community health centres in small rural communities, where clients may be personally known (or related) to staff;
- some Aboriginal and Torres Strait Islander communities have a "zero tolerance" policy towards substance abuse and their community health centres do not provide NSP services;
- few services have bilingual or multilingual staff; and

- some vending machine locations are visible to the general public—and thus also to police.

Most jurisdictions have used COAG funding to improve access to NSPs through activities such as:

- employing an Indigenous liaison person;
- employing a person to network with CALD communities;
- providing targeted education for Aboriginal and Torres Strait Islander health workers about hepatitis C and the important preventive role of NSPs;
- providing training in cultural awareness for NSP staff;
- outreach services in inner cities targeting youth, homeless people and indigenous people; and
- outreach services run by, and for particular CALD communities.

Likely impacts on hepatitis C incidence and prevalence

Most of the respondents noted that it was hard to identify evidence of a reduction in hepatitis C incidence over the short period that the programs have been operating. They nevertheless felt that the programs would have had a positive impact. The kinds of program performance information that are collected have to do with intermediate outputs (eg numbers and types of services / activities) and administrative processes, rather than health outcomes.

The multiple causes and effects of hepatitis C were considered likely to confound an assessment of the impact of any one input. One observation was that the inherent nature of the hepatitis C virus (eg its infectiousness) means that it will be extremely difficult to reduce rates of transmission.

A few stakeholders noted that recent data suggested a possible downward trend in hepatitis C incidence. They thought this could be attributable to the accessibility of NSPs. An alternative view was that this was more likely due to the recent 'heroin drought'. However, some respondents advised that the heroin drought did not necessarily lead to less injecting *per se*—rather, IDUs were substituting other injectable substances for heroin. Some stakeholders felt that users had switched to non-injecting routes of administration.

Likely impacts if programs were to cease

Overall, it was considered that the removal of the programs would have a negative impact on hepatitis C incidence, and ultimately upon prevalence. It would also be detrimental from a population health perspective as the community would not be as well protected against acquiring blood-borne viruses.

Loss of HCEP:

- At the national level, the hepatitis C prevention and awareness work undertaken by the peak bodies would virtually cease. Thus there would be no further resource materials and training programs developed for medical practitioners, other health professionals, NSP workers or peer educators—including CALD communities.

As a result, hepatitis C services would be less effective, with an indirect adverse effect on incidence and prevalence.

- In addition, if the hepatitis C treatment awareness campaign ceased, there would be a reduction in people at risk seeking testing and counselling, and a likely decrease in infected people seeking treatment—thus contributing to the spread of hepatitis C.
- Although the jurisdictions observed that HCEP funding was less significant than that from COAG, the funds nonetheless made an important contribution to the overall prevention of hepatitis C. The negative impact would be greater in the smaller jurisdictions.
- At State / Territory levels, there would be no counselling and support for people attending liver clinics.
- There would be a loss of education, information and awareness projects targeted at people who are not current IDUs, but who may potentially be at risk—eg youth, people considering body piercing and tattooing, marginalised young adults and people living in transient group situations. CALD people who had migrated from countries with a high prevalence of hepatitis C would lack appropriate information about their potential risk, about ways of avoiding transmission of infection and about the importance of being tested. Loss of all these projects could indirectly lead to an increase in the transmission of hepatitis C.
- There would be a loss of projects to reduce the stigma and discrimination against people with hepatitis C, particularly amongst the medical profession. Thus, people at risk could be reluctant to present for a test, or if they tested positive, they might not be offered treatment. As a result, the prevalence of hepatitis C could increase over time.

Loss of COAG Supporting Measures:

- All jurisdictions felt that the loss of the COAG measures would substantially diminish the NSP capacity to provide education and prevention; it would diminish their capacity to refer people into treatment and / or to assist IDUs to relinquish drug use.
- There would be a reduction in the diversity of NSP services—eg a loss of outlets such as pharmacies and mobile / outreach services. This would deny access to clean injecting equipment and the promotion of safe behaviour, and hence likely cause an increase in inappropriate disposal of injecting equipment. In addition, it is likely that the health status of IDUs would deteriorate and adversely affect their ability to maintain safe practices.
- In those jurisdictions where COAG funding was used for NSP equipment and / or NSP services in hospitals and community health centres, NSPs would virtually cease to exist.
- Targeted services to CALD communities and Aboriginal and Torres Strait Islander communities would cease, and thus IDUs from these groups would be even less likely to use NSPs.
- In summary, jurisdictions considered that the loss of the COAG funding would be detrimental and likely to cause an increase in the incidence of hepatitis C and other blood borne viruses.

Possible improvements to the programs

All those consulted saw the need for change in the administrative arrangements for HCEP. It was noted that the current arrangements had been particularly problematic for the smaller jurisdictions and NGOs. Suggestions for administrative change included:

- providing guaranteed funding over a four-year period;
- providing funds as early as possible in each financial year; and
- reducing the amount and frequency of reporting.

Jurisdictions would like to be involved in designing improved performance indicators for both programs. They want to develop better data and information collection to allow the impacts and outcomes of these programs to be measured.

Some respondents wanted to see a major national hepatitis C awareness promotion. Others, however, disagreed because the majority of incident cases of hepatitis C occur amongst IDUs. On the other hand, there was support for developing and implementing a narrower hepatitis C community awareness campaign targeted at older, mainstream, and CALD communities.

There was support for expanding the quantity of treatment. It was considered that more treatment now would reduce the future burden of the disease. Suggested initiatives included:

- greater support and counselling for people undergoing treatment;
- an increase in awareness training for the medical workforce, to reduce the stigma associated with hepatitis C, including skills in dealing with people who are living with, or at risk of contracting hepatitis C;
- in conjunction with the workforce development, extending an s100 GP pilot and increasing the uptake by GPs—even though others had reported that the pilot had been a failure;
- developing and mass-producing reliable and up-to-date information about treatment options, in varied, accessible formats, including for CALD communities and Aboriginal and Torres Strait Islander people—and involving target groups in the development of the material;
- producing user-friendly information leaflets about managing the treatment regime—for distribution to GPs and specialists as patient hand-outs;
- developing an electronic data exchange to facilitate shared-care delivery of treatment in rural and remote areas between specialist facilities and GPs.

Most respondents considered that peer education was valuable, and should be expanded. This could include the development of nationally recognised training courses. By building skills and enhancing self-esteem, the impact of peer educators could be more effective and hence more likely to lead to changes in injecting behaviour.

There was need for a more national effort in reaching CALD communities. Suggested initiatives included:

- training in cultural competencies for staff in services which work with IDUs; and
- developing and testing effective ways of providing hepatitis C information to CALD communities.

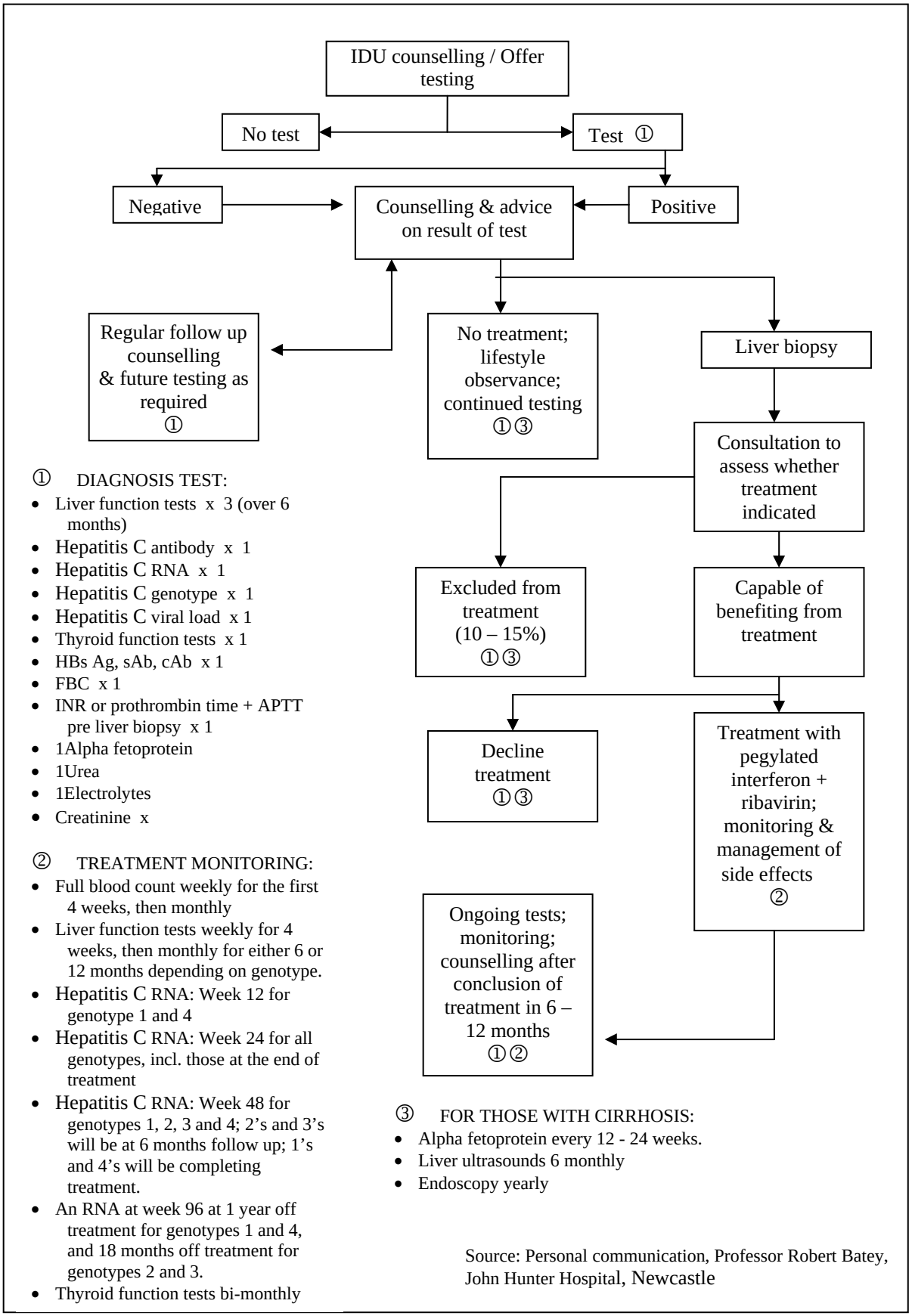
Other comments

Most jurisdictions identified the prison system as a source of hepatitis C infection and re-infection, but were unable to provide conclusive evidence that people had actually been infected with hepatitis C while in prison. They referred to the high hepatitis C prevalence amongst prisoners (in the order of 50% for males and 60% for females) as a cause for concern.

It was noted that NSPs are not provided in prisons. Most jurisdictions reported that there were some hepatitis C prevention and awareness activities occurring within prisons, but these were generally outside the scope of the programs under evaluation.

Future growth of prevention initiatives is threatened by the general community's lack of tolerance for many harm reduction activities. Some respondents advocated programs to support research into community awareness topics such as the infinitesimal risk of infection which needle stick injuries actually pose to the general public, or the allegation that NSPs might "recruit" people into injecting drug use. However, removing as far as possible, the visible evidence of needle and syringe usage, and providing hotlines for needle and syringe cleanup was regarded the most vital elements in maintaining community acceptance of NSPs and other preventive services.

APPENDIX 5
STANDARD PROTOCOLS FOR MANAGING PERSONS AT RISK OF HEPATITIS C AND FOR THEIR ONGOING TREATMENT AND MONITORING



① DIAGNOSIS TEST:

- Liver function tests x 3 (over 6 months)
- Hepatitis C antibody x 1
- Hepatitis C RNA x 1
- Hepatitis C genotype x 1
- Hepatitis C viral load x 1
- Thyroid function tests x 1
- HBs Ag, sAb, cAb x 1
- FBC x 1
- INR or prothrombin time + APTT pre liver biopsy x 1
- 1Alpha fetoprotein
- 1Urea
- 1Electrolytes
- Creatinine x

② TREATMENT MONITORING:

- Full blood count weekly for the first 4 weeks, then monthly
- Liver function tests weekly for 4 weeks, then monthly for either 6 or 12 months depending on genotype.
- Hepatitis C RNA: Week 12 for genotype 1 and 4
- Hepatitis C RNA: Week 24 for all genotypes, incl. those at the end of treatment
- Hepatitis C RNA: Week 48 for genotypes 1, 2, 3 and 4; 2's and 3's will be at 6 months follow up; 1's and 4's will be completing treatment.
- An RNA at week 96 at 1 year off treatment for genotypes 1 and 4, and 18 months off treatment for genotypes 2 and 3.
- Thyroid function tests bi-monthly

③ FOR THOSE WITH CIRRHOSIS:

- Alpha fetoprotein every 12 - 24 weeks.
- Liver ultrasounds 6 monthly
- Endoscopy yearly

Source: Personal communication, Professor Robert Batey, John Hunter Hospital, Newcastle

APPENDIX 6
LIST OF PERSONS INTERVIEWED DURING STAKEHOLDER CONSULTATIONS

Name	Affiliation	Date
Mr Owen Westcott	NSW Department of Health	10 May 2005
Mr Ronald Govers	NSW Department of Health	10 May 2005
Ms Jenny Iversen	NSW Department of Health	10 May 2005
Mr Charles Wood	Directions ACT	11 May 2005
Ms Kim Stewart	Chair, Intergovernmental Committee on AIDS, Hepatitis C and Related Diseases	12 May 2005
Mr Tadgh McMahon	Multicultural HIV/AIDS and Hepatitis Service	22 April 2005
Ms Annie Madden	Australian Illicit and Injecting Drug Users' League	22 April 2005
Ms Levinia Crooks	Australasian Society for HIV Medicine	27 April 2005
Ms Lisa Bastian	WA Department of Health	27 April 2005
Mr Jude Berman	WA Department of Health	27 April 2005
Ms Lynette Evans	WA Department of Health	27 April 2005
Ms Helen Tyrrell	Australian Hepatitis Council	28 April 2005
Ms Maria Karvelas	Department of Human Services, Victoria	29 April 2005
Ms Cate Mettam	SA Department of Health	29 April 2005
Mr Stephen Lymb	SA Department of Health	29 April 2005
Professor Sue Kippax	National Centre in HIV/Social Research, UNSW / MACASHH, Hepatitis C Subcommittee	2 May 2005
Dr Alex Wodak	Director, Alcohol and Drug Service, St Vincent's Hospital, Darlinghurst	2 May 2005
Mr Gary Boddy	Queensland Health	3 May 2005
Ms Tanya Bain	Queensland Health	3 May 2005
Ms Lesley Maher	Queensland Health	3 May, 2005
Professor Robert Batey	Director, Hunter Health Area Drug and Alcohol Clinical Services / John Hunter Hospital, Newcastle and Chair, Hepatitis C Subcommittee of the MACASHH	4 May 2005
Ms Linda deRidder	ACT Health	4 May 2005
Ms Helene Delany	ACT Health	4 May 2005
Ms Brooke Anderson	ACT Health	4 May 2005
Ms Jennie Shortt	Alcohol and Harm Reduction Initiatives Section, Drug Strategy Branch, DoHA	5 May 2005
Dr Mathew Law	National Centre in HIV Epidemiology and Clinical Research, UNSW	5 May 2005
Mr Mick Turner	Special Access and Analysis Section, Pharmaceutical Access and Quality Branch, DoHA	5 May 2005
Ms Julianne Quaine	Hepatitis C Section, Targeted Prevention Programs Branch, DoHA	5 May 2005
Ms Gina Hurley	Hepatitis C Section, Targeted Prevention Programs Branch, DoHA	5 May 2005
Ms Bernadette Bernasconi	Alcohol and Harm Reduction Initiatives Section, Drug Strategy Branch, DoHA	5 May 2005

APPENDIX 7
TEMPLATES FOR QUESTIONS USED IN STAKEHOLDER CONSULTATIONS

A. Questions for representatives of the Commonwealth Department of Health and Ageing

The following questions either relate to, or seek clarification of information already provided by the Commonwealth.

1. With reference to the **Hepatitis C Education and Prevention Initiative,** would you please indicate whether there have been any changes to the Program's aims and types of activities over the whole period 1999/00-2004/5?
2. With reference to the **National Public Health Program** funding, would you please indicate what expenditure has been incurred on hepatitis C education and preventative activities, the nature of those activities, and any relevant results reported against key performance indicators (KPIs)?
3. In relation to the **Hepatitis C Education and Prevention Initiative**, are any KPIs used, and if so, what results have been reported against them?
    - Which other benefits have the programs had in addition to meeting / not meeting KPIs?
4. In relation to the **COAG Illicit Drug Diversion Package – Supporting Measures**, are any KPIs used, and if so, what results have been reported against them?
    - Which other benefits have the programs had in addition to meeting / not meeting KPIs?

B. Questions for representatives of the States and Territories

1. The Commonwealth recently asked you to provide information about any separate State / Territory-funded hepatitis C education and prevention activities. Can you please provide copies of any program or project reviews of these programs which may have been undertaken?
    - Can you please confirm the expenditure data for these activities?
2. In addition to the information you have provided to the Commonwealth about the **Hepatitis C Education and Prevention Initiative** and the **COAG Supporting Measures,** can you please provide copies of any program or project reviews which may have been undertaken?
    - Can you please confirm the expenditure data for the activities funded under these programs?
3. Can you please indicate what, in your opinion, are the strengths and weaknesses of the Programs referred to in 1 and 2?
4. In relation to programs referred to in 1 above, do any of them use key performance indicators (KPIs), and if so, what results have been reported against them? What are some of the other benefits, if any, of these programs?
5. To what extent do your funded projects/activities provide information about, or direct people to needle and syringe programs (NSPs)? How accessible (geographically,

culturally etc) are NSPs, and are there sufficient numbers available for injecting drug users (IDUs)?

6. To what extent do your funded projects / activities such as awareness raising, result in:
    - people seeking testing, counselling, advice, treatment, etc;
    - people knowing their hepatitis C status and therefore can prevent further spread; and
    - greater community awareness, contributing to reducing stigma and discrimination?
7. To what extent are your funded projects/activities directed to:
    - people who are IDUs who do not access NSPs, either by choice or involuntarily; and
    - people who are not IDUs?
8. If the Commonwealth's **Hepatitis C Education and Prevention Initiative**, the **COAG Supporting Measures** and other separate State / Territory-funded measures were all removed and NSPs were left intact, what would be the impact upon the operation of NSPs? How would this influence the spread of hepatitis C? Why?
9. If just the Commonwealth's **Hepatitis C Education and Prevention Initiative** were removed, and the **COAG Supporting Measures** and other State / Territory-funded supporting measures left in place, how would this influence the incidence and prevalence of hepatitis C, and what would be the impact upon the operation of NSPs? Why?
10. Although the study does not include hepatitis C education and prevention in prisons, can you please provide information about prison systems as foci for the transmission of infections to the non-prison population. Are there any non-prison programs that address this risk? Can you please provide information about any State-funded initiatives aimed at hepatitis C education and prevention in custodial settings, including for youth custodial services?
11. Can you identify any information, research or other reports in your State / Territory which may provide information and data relevant to the prevention of hepatitis C?
12. Do you have any data about trends in hepatitis C notifications and incident cases?

C. Questions for representatives of AHC, AIVL, ASHM and MHAHS

1. What are your organisation's main client / target groups: eg health and other professionals, young people, general population, people affected by hepatitis C, IDUs etc?
2. How well do you think your funded activities have served your client group(s)? What improvements could you make? (Note that this also includes DoHA **National Public Health Program** funding.)
3. To what extent do your funded activities provide information about, or direct people to, needle and syringe programs (NSPs)? How accessible (geographically, culturally etc) are NSPs, and are they sufficient to meet the needs of IDUs?
4. To what extent do your funded projects / activities such as awareness raising, result in:
    - people seeking testing, counselling, advice, treatment, etc;
    - people knowing their hepatitis C status and therefore can prevent further spread; and
    - greater community awareness, contributing to reducing stigma and discrimination?

5. To what extent are your funded activities provided to people who are IDUs who do not access NSPs, either by choice or involuntarily?
6. To what extent are your funded activities specifically directed to people who are not IDUs? Please provide information about these activities and the intended client groups.
7. If your organisation were to receive additional funding (10% - 20%) what would you do with it? What impacts do you estimate it would have on your target population / clients?
8. How long does it take to get results "on the ground" once funding has been allocated to you?
9. If your activities ceased, what effect would this have on:
    - Individual and community awareness of hepatitis C;
    - Numbers of people seeking testing, counselling, treatment etc;
    - The spread of hepatitis C; and
    - NSPs? Why?
10. Are there any activities / services you would like to provide but which are currently ineligible for funding?
11. What are your organisation's strengths and weaknesses?
12. Have you undertaken any internal evaluation of your organisation and its activities? Do you report against key performance indicators (KPIs)? What are these and what have been the results? Are there any other unexpected benefits of your programs besides meeting KPIs?
13. Can you identify any information, research or other reports which may provide information and data relevant to the prevention of hepatitis C?
14. Do you have any information about trends in hepatitis C notifications and incident cases?

D. Questions for representatives IGCAHRD

1. How well do you think the Commonwealth's **Hepatitis C Education and Prevention Initiative,** the **COAG Supporting Measures** and any separate State / Territory-funded initiatives of which you are aware are working?
2. What do you consider to be the overall strengths and weaknesses of these programs?
    - What do you consider to be the main benefits arising from these programs, including the impact on hepatitis C incidence and prevalence?
3. To what extent do you think that these programs are interdependent, including with the needle and syringe programs?
4. Do you get / would you want regular performance information about these programs? How would such information be useful to your committee?
5. How would you see the future development of Government initiatives in this area, eg: continuation of existing arrangements; new directions or focus; more or less funding; different types of projects / activities; different sponsors?
6. If the Commonwealth's **Hepatitis C Education and Prevention Initiative**, the **COAG Supporting Measures** and other separate State / Territory-funded measures were all removed and NSPs were left intact, how would this influence the incidence and prevalence of hepatitis C? What would be the impact upon the operation of NSPs? Why?
7. If just the Commonwealth's **Hepatitis C Education and Prevention Initiative** were removed, and the **COAG Supporting Measures** and other State / Territory-funded

supporting measures left in place, how would this influence the incidence and prevalence of hepatitis C? What would be the impact upon the operation of NSPs? Why?

8. Can you identify / provide any information, research or other reports which may provide information and data relevant to the prevention of hepatitis C, including trends in HIV / AIDS notification and incident cases?

APPENDIX 8

1. SUMMARY OF HCEP PROJECTS FUNDED BETWEEN 1999/00 – 20003/04

State/Territory	Reporting (Financial) Year				Collaborators	Notes
	1999/00*	2000/01	2001/02	Commitments for 2002/03**		
ACT		Strengthening community-based hepatitis C-related services in the ACT				
		Public Awareness Campaign	Public Awareness Campaign	Public Awareness Campaign	ACT Hepatitis C Council	
		Needs-Based Education Program	Needs-Based Education Program	Needs-Based Education Program	ACT Hepatitis C Council	
		School-Based Education Program	School-Based Education Program	School-Based Education Program	ACT Hepatitis C Council	
		Increased Support Program	Increased Support Program	Increased Support Program	ACT Hepatitis C Council	
	Program Coordination	Program Coordination	Program Coordination	Program Coordination	ACT Hepatitis C Council	
				Print, Radio and Television media campaign		
NSW	NSW Hepatitis C Public Awareness/Mass Media Campaign					
	Program Coordination/Policy Development	Program Coordination/Policy Development	Program Coordination/Policy Development	Program Coordination/Policy Development		
		Facilitation and coordination of prevention, education and psychosocial support	Facilitation and coordination of prevention, education and psychosocial support	Facilitation and coordination of prevention, education and psychosocial support	Area Health Services Hepatitis C Council of NSW	
		Infection Control Education program for skin penetration operators	Infection Control Education program for skin penetration operators	Infection Control Education program for skin penetration operators	Hunter Centre for Health Advancement and the University of Newcastle	
VIC		Hepatitis C Awareness Week and Conference (*Hepatitis C: Everyday People*)	Hepatitis C Awareness Week and Conference (*Hepatitis C: Everyday People*)	Hepatitis C Awareness Week and Conference (*Hepatitis C: Everyday People*)	Hepatitis C Council of Victoria	
		Adult Prison Program education sessions	Adult Prison Program education sessions	Adult Prison Program education sessions	Hepatitis C Council of Victoria	
		Body Art Program education/information campaign	Body Art Program education/information campaign	Body Art Program education/information campaign	Hepatitis C Council of Victoria	
		Vietnamese Information Line on Hepatitis C	Vietnamese Information Line on Hepatitis C	Vietnamese Information Line on Hepatitis C	AIDS, Hepatitis and Sexual Health Line Inc.	
		Rural Education Program	Rural Education Program	Rural Education Program	Hepatitis C Council of Victoria	
			Hepatitis C Information/Education Project	Hepatitis C Information/Education Project	VIVAIDS Inc.	

State/Territory	Reporting (Financial) Year				Collaborators	Notes
	1999/00*	2000/01	2001/02	Commitments for 2002/03**		
			Education and Information for Juvenile Justice Centres/Harm Reduction and Peer Education	Education and Information for Juvenile Justice Centres/Harm Reduction and Peer Education	VIVAIDS Inc.	
QLD	Hepatitis C training and education in far north Queensland					
		Hepatitis C Education for Rural Health Care Workers	Hepatitis C Education for Rural Health Care Workers	Hepatitis C Education for Rural Health Care Workers	School of Medicine, University of QLD	
		Lifestyle Education Project in Prisons	Lifestyle Education Project in Prisons	Lifestyle Education Project in Prisons	Family Planning Association of QLD Inc	
		Education for Health Care Workers and the General Community	Education for Health Care Workers and the General Community	Education for Health Care Workers and the General Community	Hepatitis C Council of QLD	
			Brief intervention at NASPS	Brief intervention at NASPS		
			Establishment of Project Officer - Cairns	Establishment of Project Officer - Cairns		
			Establishment of Agency Forums	Establishment of Agency Forums		
SA	Hepatitis C Prevention Resource for Indigenous Communities	Hepatitis C Prevention Resource for Indigenous Communities	Hepatitis C Prevention Resource for Indigenous Communities	Hepatitis C Prevention Resource for Indigenous Communities		
	Rural/Remote Education and Prevention Project	Rural/Remote Education and Prevention Project	Rural/Remote Education and Prevention Project	Rural/Remote Education and Prevention Project	Hepatitis C Council of South Australia	
			Community Hepatitis C Prevention, Education and Care Program (*C Clearly*)	Community Hepatitis C Prevention, Education and Care Program (*C Clearly*)	Department of General Practice, Adelaide University	
			"Don't Cop Another Sentence" Harm Reduction Campaign Card	"Don't Cop Another Sentence" Harm Reduction Campaign Card	Partners of Prisoners Program (POP), OARS SA	
WA	Information, education and training service for health professionals and the community	Information, education and training service for health professionals and the community	Information, education and training service for health professionals and the community		Hepatitis C Council of WA	
	Expansion of existing support services for people infected with or affected by hepatitis C	Expansion of existing support services for people infected with or affected by hepatitis C	Expansion of existing support services for people infected with or affected by hepatitis C		Hepatitis C Council of WA	
		Hepatitis C Peer Education Enhancement Project	Hepatitis C Peer Education Enhancement Project	Hepatitis C Peer Education Enhancement Project	WA Substance Users' Association WASUA)	
		Support for Health Clinic at WASUA	Support for Health Clinic at WASUA		WA Substance Users' Association WASUA)	
		Blood Borne Virus education for people in custodial settings	Blood Borne Virus education for people in custodial settings			

State/Territory	Reporting (Financial) Year				Collaborators	Notes
	1999/00*	2000/01	2001/02	Commitments for 2002/03**		
		Skin penetration education and prevention project for people in custodial settings	Skin penetration education and prevention project for people in custodial settings			
		Infection control education for skin penetration practitioners and local government authority environmental health officers	Infection control education for skin penetration practitioners and local government authority environmental health officers	Infection control education for skin penetration practitioners and local government authority environmental health officers		
		Regional initiative grants for Indigenous people affected by hepatitis C	Regional initiative grants for Indigenous people affected by hepatitis C			
		Provision of hepatitis C-related services in regional areas	Provision of hepatitis C-related services in regional areas	Provision of hepatitis C-related services in regional areas		
NT		Needs Assessment				
		Peer Group Collaboration and Education	Peer Group Collaboration and Education	Peer Group Collaboration and Education	Top End User's Forum	
TAS	Coordinator/Policy Officer (Hepatitis C) Sexual Health Branch	Coordinator/Policy Officer (Hepatitis C) Sexual Health Branch	Coordinator/Policy Officer (Hepatitis C) Sexual Health Branch			Until this initiative there was no organised representation of people with hepatitis C in Tasmania.
		Development with the Policy Officer of a local hepatitis C policy				
		Hepatitis C education, prevention and treatment initiatives in Tasmanian custodial settings	Hepatitis C education, prevention and treatment initiatives in Tasmanian custodial settings			
	Tasmanian Police Infection Control Project	Tasmanian Police Infection Control Project			Tasmanian Police Service	
			State-wide Hepatitis C Education and Policy Implementation	State-wide Hepatitis C Education and Policy Implementation		
Commonwealth						
AIVL	Development of an Accredited Training Program	Development and distribution of a safer injecting video to be used as a hepatitis C education tool	Development of an Accredited Training Program (including video component)	Development of an Accredited Training Program (including video component)		
	Development and distribution of AVANT cards (4 per year) to targeted injecting populations	Development and distribution of AVANT cards (4 per year) to targeted injecting populations	Development and distribution of AVANT cards (4 per year) to targeted injecting populations	Development and distribution of AVANT cards (4 per year) to targeted injecting populations		
	Dissemination of accurate and timely information via the AIVL website	Dissemination of accurate and timely information via the AIVL website	Dissemination of accurate and timely information via the AIVL website	Dissemination of accurate and timely information via the AIVL website		
	Information for best practice to user groups via the AIVL website	Information for best practice to user groups via the AIVL website	Information for best practice to user groups via the AIVL website	Information for best practice to user groups via the AIVL website		

State/Territory	Reporting (Financial) Year				Collaborators	Notes
	1999/00*	2000/01	2001/02	Commitments for 2002/03**		
	Development and production of a resource manual for workers in user peer education	Development and distribution of a resource manual for workers in user peer education	Development and distribution of a resource manual for workers in user peer education	Development and distribution of a resource manual for workers in user peer education		
	HEPack information sheets for use in local user groups	HEPack information sheets for use in local user groups	HEPack information sheets for use in local user groups	HEPack information sheets for use in local user groups		
	Educator's forum	Planning for the National Hepatitis C Educator's forum	Planning for the National Hepatitis C Educator's forum	Planning for the National Hepatitis C Educator's forum		
	Development of a prevention resource for Indigenous injecting drug users	Development and distribution of a prevention resource for Indigenous injecting drug users	Development and distribution of a prevention resource for Indigenous injecting drug users	Development and distribution of a prevention resource for Indigenous injecting drug users		
	Development of a resource on safer injecting techniques for incarcerated injecting drug users	Development and distribution of a resource on safer injecting techniques for incarcerated injecting drug users	Development and distribution of a resource on safer injecting techniques for incarcerated injecting drug users	Development and distribution of a resource on safer injecting techniques for incarcerated injecting drug users		
	Development of a resource for low literacy/migrant populations	Development and distribution of a resource for low literacy/migrant populations	Development and distribution of a resource for low literacy/migrant populations	Development and distribution of a resource for low literacy/migrant populations		
	Participation in research activities and surveillance programs as requested	Participation in research activities and surveillance programs as requested	Participation in research activities and surveillance programs as requested	Participation in research activities and surveillance programs as requested		
	Proactive development of research proposals and commissioning of appropriate research	Proactive development of research proposals and commissioning of appropriate research	Proactive development of research proposals and commissioning of appropriate research	Proactive development of research proposals and commissioning of appropriate research		
	Production and distribution of *Hepatitis See*	Production and distribution of *Hepatitis See*	Production and distribution of *Hepatitis See*	Production and distribution of *Hepatitis See*		
	Production and distribution of *Liver First* and *Positive Users* booklets	Further development and distribution of campaign media	Further development and distribution of campaign media	Continued distribution of the *Really Positive* booklets		
	Participation with policy development and evaluation processes	Participation with policy development and evaluation processes	Participation with policy development and evaluation processes	Participation with policy development and evaluation processes		
	Participation in internationally relevant forums through the international drug users network	Participation in internationally relevant forums through the international drug users network	Participation in internationally relevant forums through the international drug users network	Participation in internationally relevant forums through the international drug users network		
			Development of an Effective Training Program based upon the Accredited Training Program	Development of an Effective Training Program based upon the Accredited Training Program		

State/Territory	Reporting (Financial) Year				Collaborators	Notes
	1999/00*	2000/01	2001/02	Commitments for 2002/03**		
			Development of a resource for GPs on discrimination, barriers to treatment and making a service 'user friendly'	Development of a resource for GPs on discrimination, barriers to treatment and making a service 'user friendly'		
				Production and distribution of a Hepatitis C Supplement in each edition of *Junkmail*		
				Development of educational resources for injecting drug users		
				Hepatitis C Treatment and Discrimination Program		
AHC	Development of an education strategy	Development of an education strategy	Further development of the education strategy	Further development of the education strategy		
	Creation of an AHC National Newsletter/Bulletin	Production of an AHC National Newsletter/Bulletin	*Australian Hepatitis Chronicle*	*Australian Hepatitis Chronicle*		This was an in-house bulletin
	Development and production of a Health maintenance and monitoring resource	Development and production of a Health maintenance and monitoring resource	Health Maintenance and Monitoring Project , Being Healthy Project and the Access Project	Health Maintenance and Monitoring Project , Being Healthy Project and the Access Project		This initiative has resulted in several booklets/leaflets being produced.
				Further capacity building and hepatitis needs assessment		
	Establishment of a national 1800 hepatitis C referral line/AHC website	Developing the AHC website	Further development and updates of the AHC website	Further development and updates of the AHC website		After consultation it was decided to divert funding for the referral line to a website.
	Ongoing content and process evaluation	Ongoing content and process evaluation	Ongoing content and process evaluation	Ongoing content and process evaluation		
	Development and production of Testing/Pre-diagnosis leaflets	Distribution of Testing/Pre-diagnosis leaflets	Distribution of Testing/Pre-diagnosis leaflets	Distribution of Testing/Pre-diagnosis leaflets		
	Video education project					
	Facilitation of the National Hepatitis C Educators Workshop	Facilitation of the National Hepatitis C Educators Workshop	Facilitation of the National Hepatitis C Educators Workshop	Facilitation of the National Hepatitis C Educators Workshop		
	The updating and reprinting of *Contact 99*	The updating and reprinting of *Contact 99*	Production of *Contact '01*	Reprinting and distribution of *Contact '01*		This was a post-diagnosis resource produced and distributed through hepatitis C councils
	Updating and reprinting the *Women and Hepatitis C* booklet	Reprinting and distribution of the *Women and Hepatitis C* booklet	Reprinting and distribution of the *Women and Hepatitis C* booklet	Reprinting and distribution of the *Women and Hepatitis C* booklet		
		Reprinting and distribution of the *Preparing for Testing* Resource	Reprinting and distribution of the *Preparing for Testing* Resource	Reprinting and distribution of the *Preparing for Testing* Resource		
				Development of a resource on disclosure		

State/Territory	Reporting (Financial) Year				Collaborators	Notes
	1999/00*	2000/01	2001/02	Commitments for 2002/03**		
		The Hepatitis C Treatment Summit				These were carried out using residual funding from earlier periods.
		Communications campaign against discrimination	Communications campaign against discrimination	Communications campaign against discrimination		
		Development of a discrimination strategy	Development of a discrimination strategy			
ASHM		Day-long hepatitis C education program	Day-long hepatitis C education program			
		Development of a National hepatitis C GP Education/Information Providers Network	Further development of the National hepatitis C GP Education/Information Providers network			
		Development of the GP Support Website to host existing GP support material	Creation of the GP Support Website and Hypermedia Support Website			
		Development of an internet chat room for GPs	Pilot-testing of the GP Chat Room			
		Inclusion of hepatitis C in the ASHM Monograph	Increased printing and distribution of current and future ASHM Monographs with hepatitis C included	Increased printing and distribution of ASHM Monographs with hepatitis C included		
		Creation of a Health Care Worker hypermedia site	Further development of an interactive educational website for nurses, ambulance workers and dentistry workers	Further development of an interactive educational website for nurses, ambulance workers and dentistry workers		
		Health Care Worker education: Nurses Journal Supplement on hepatitis C	Also publish area-specific professional journal supplements on hepatitis C for ambulance and dentistry workers	Publish area-specific professional journal supplements on hepatitis C for ambulance and dentistry workers		
		Creation of a hepatitis C Health Care Worker website	Hosting the hepatitis C information website	Hosting the hepatitis C information website		
		Development of the Hepatitis C Information Service	Hosting the hepatitis C information service for Health Care Workers	Hosting the hepatitis C information service for Health Care Workers		
		Active encouragement of research into hepatitis C	Active encouragement both of research into hepatitis C and training for target groups through expansion of training curricula to include hepatitis C-related issues	Active encouragement both of research into hepatitis C and training for target groups through expansion of training curricula to include hepatitis C-related issues		
		Hepatitis C rural broadcast (satellite)	Re-broadcasting hepatitis C programs and supply of site pack material			
		Development of the electronic information resource Positive Information for Patients				

State/Territory	Reporting (Financial) Year				Collaborators	Notes
	1999/00*	2000/01	2001/02	Commitments for 2002/03**		
			Development and production of a basic science and pathogenesis resource and distance learning package	Development and production of a basic science and pathogenesis resource and distance learning package		
			Sponsorship of the 2002 ASHM Conference to include a day-long program on hepatitis			
			Promotion of drug dependency, injecting and hepatitis C as essential areas of study to be included in undergraduate medical training	Promotion of drug dependency, injecting and hepatitis C as essential areas of study to be included in undergraduate medical training		
MHAHS		National consultation and evaluation				
			Production of a HIV/AIDS and Hepatitis C video/handbook	Production of a HIV/AIDS and Hepatitis C video/handbook		
			Ethnic media campaign	Ethnic media campaign		
			"Train the Trainer" Seminars	"Train the Trainer" Seminars		
NCHECR		Program on Occupational exposure to hepatitis C infection among Australian health care workers	Monitoring occupational exposure to hepatitis C infection among Australian health care workers	Monitoring occupational exposure to hepatitis C infection among Australian health care workers		
		Surveillance for hepatitis C antibodies among clients of needle and syringe programs in Australia	Monitoring hepatitis C antibodies among clients of needle and syringe programs in Australia	Monitoring hepatitis C antibodies among clients of needle and syringe programs in Australia		
		Routine case reporting for hepatitis C	Routine case reporting for hepatitis C	Routine case reporting for hepatitis C		
		National Incident Hepatitis C Case Register	National Incident Hepatitis C Case Register	National Incident Hepatitis C Case Register		
		Monitoring hepatitis C incidence at selected sites	Monitoring hepatitis C incidence at selected sites	Monitoring hepatitis C incidence at selected sites		
		Monitoring hepatitis C incidence in the Australian Defence Force	Monitoring hepatitis C incidence in the Australian Defence Force	Monitoring hepatitis C incidence in the Australian Defence Force		
		Monitoring hepatitis C incidence in blood donors in Australia	Monitoring hepatitis C incidence in blood donors in Australia	Monitoring hepatitis C incidence in blood donors in Australia		
		Surveillance of the long-term outcomes of chronic hepatitis C infection	Surveillance of the long-term outcomes of chronic hepatitis C infection	Surveillance of the long-term outcomes of chronic hepatitis C infection		
		Estimates and projections of the hepatitis C epidemic in Australia	Estimates and projections of the hepatitis C epidemic in Australia	Estimates and projections of the hepatitis C epidemic in Australia		
		hepatitis C Surveillance among people seen at sexual health clinics and prisons in Australia	hepatitis C Surveillance among people seen at sexual health clinics and prisons in Australia	hepatitis C Surveillance among people seen at sexual health clinics and prisons in Australia		

State/Territory	Reporting (Financial) Year				Collaborators	Notes
	1999/00*	2000/01	2001/02	Commitments for 2002/03**		
			Development and coordination of hepatitis C natural history studies	Development and coordination of hepatitis C natural history studies		

* This reporting year is poorly reported on due to delays in establishing deeds of agreement between the Commonwealth and the States/Territories, and funding agreements between the Commonwealth and various agencies.
** Similarly the commitments for 2002/2003 are based upon references made in reports submitted to the Commonwealth in 2002.
Source: Butler and Quinn (2003).

APPENDIX 8, Continued

2. EXAMPLES OF STATE & TERRITORY HEPATITIS C PROJECTS, 1999/00 – 2004/05, OTHER THAN NSP ACTIVITIES, AS ADVISED BY STATES AND TERRITORIES

(Note: List may be incomplete, as not all States and Territories supplied data)

1. Training and awareness for health professionals

NSW

- Funding to the Hepatitis C Council of NSW (HCCNSW) to support a range of education, prevention, referral, and information and support services for people living with or at risk of hepatitis C infection in NSW. HCCNSW also provides resources and training to health care and related workers on hepatitis C issues. Services of HCCNSW currently include the Hep C Helpline, a telephone information and support service for people with or concerned about hepatitis C.

- Funding to ASHM to undertake the Viral Hepatitis Education Program, a pilot project to enable accredited GPs to be eligible prescribers of highly specialised drugs (HSD) for the treatment of chronic hepatitis C within the Administrative Arrangements of the Highly Specialised Drugs Program.

Victoria

- Redevelopment and accreditation of the General Practitioner Education Program.

- Redevelopment and accreditation of competency based pre and post HIV and hepatitis C test counselling training for health workers.

- Delivery of a pilot hepatitis C treatment community prescribers training program for Victorian general practitioners.

- Development and implementation of an electronic data collection system to monitor Needle and Syringe Programs' client demographics and usage of the service.

Queensland

- Rockhampton Health Service District: Provision of training for health care workers.

- Toowoomba Health Service District: Community wide response to injecting drug initiation.

- University of Queensland, School of Medicine: Hepatitis C Introductory training program for GPs and other health care workers.

- Communicable Diseases Unit: State-wide administration and other projects (skin penetration education and non injecting routes of administration project).

- Rockhampton Health Service District: Provision of training for health care workers.

- Townsville Health Service District: Provision of training for health care workers.

- University of Queensland, Queensland Alcohol & Drug Research & Education Centre: Development of Hepatitis C educational guidelines targeting educators and service providers working with young injecting drug users.

- University of Queensland, Queensland Alcohol & Drug Research & Education Centre: Hepatitis C Research into opportunities for interventions appropriate for young *injecting* drug users at risk of detention—design and implement research project which identifies opportunities for intervention with young injecting drug users who are at risk of detention or incarceration. Guidelines to be developed and training of peer-oriented educators and service providers. (full stop)

- University of Queensland, School of Medicine: Research project to identify the most appropriate method of communicating with and educating GPs that will improve the knowledge and attitudes of all GPs in Queensland—including those in training—of all aspects of hepatitis C infection, treatment and care.

2. Education and information targeted at particular groups, especially hard-to-reach groups such as youth CALD and Indigenous communities

NSW

- Production of a hepatitis C treatment resource in six community languages and plain English.

- CALD Hepatitis C demonstration project, to produce prevention resources in 3 priority community languages.

- Hepatitis C public awareness campaign in March 2000, "Hepatitis C – Understanding is the Answer", aimed at increasing awareness of hepatitis C and reduce misinformation.

- Prevention, education, health promotion, care, treatment and support, and surveillance programs delivered primarily within the public sector through the eight Area Health Services.

- Funding for an education and development team to support organisations in the enhancement of their response to hepatitis C, through educational and capacity building initiatives, including in-service education, training sessions, planning workshops and speakers; publication of information booklets, brochures and fact sheets, as well as a quarterly magazine, "The Hep C Review".

- Aboriginal hepatitis C demonstration project, aimed at capacity building in Aboriginal sexual health workers.

Victoria

- Strengthening of hepatitis C outreach programs targeting Cambodian, Laotian and Vietnamese communities. Primarily drug harm reduction intervention that includes hepatitis C education and prevention.

- Provision of hepatitis C and related issues training to Aboriginal community health workers including evaluation.

- Development and implementation of hepatitis C education and prevention intervention for Victorian homeless youth.

- Development of a web-based education activity on hepatitis C for schools.

Queensland

- Brisbane Youth Service: Hepatitis C education and prevention initiatives for young people accessing the organisations services (youth specific health services including a needle and syringe service).

- Drug Users Network Education and Support Inc: Provision of hepatitis C harm reduction outreach, including education and prevention initiatives for people accessing the organisation's services.

- Hepatitis C Council of Queensland: Core funding to the organisation that, as part of their core services, provides education and prevention.

- Sunshine Coast Injectors Voice and Action Association: Hepatitis C Project Officer to deliver education and prevention initiatives for people accessing the organisations services.

- Youth and Family Services (Logan City) Inc: Education and prevention initiatives for young people accessing the organisations services.

- Ethnic Communities Council of Queensland: non English speaking background (NESB) injecting drug user project to increase awareness of hepatitis C and health risks, increase best practice injection techniques and referral (including education and prevention).

- Youth Service Providers Inc: Education and prevention initiatives for young people accessing the organisations services.

- Central West Health Service District: "Let's Talk Hepatitis C", an awareness program for the community and their health service providers.

- Youth Service Providers Inc: Education and prevention initiatives for young people accessing the organisation's services.

- Toowoomba Health Service District: Community wide response to injecting drug initiation.

3. Peer education for IDUs

NSW

- Support for NSW Users' and AIDS Association (NUAA), a non-government, community-based organisation whose primary function is to provide information, support and peer education services to injecting drug users in NSW. NUAA aims to contribute to a reduction in harms associated with illicit drug use, in particular the transmission of blood borne infections, and to promote the health and well-being of IDUs.

- Support to NUAA for one year enhancement to pilot partnership projects in two Area Health Services (Western Sydney and Hunter).

Queensland

- Queensland Intravenous AIDS Association Inc: Increase capacity to recruit, train and deploy volunteers. Coordinate with services to access initiatives.

- Project addressing hepatitis C rates and access to primary health care amongst itinerants in Fortitude Valley.

WA

- Funding to WA Substance Users Association.

ACT

- Funding to Canberra Alliance for Harm Minimisation & Advocacy (CAHMA) tp provide information and education with the emphasis on minimising potential harm as a result of injecting and other drug use.

4. Prison services education for prisoners, their families and prison workers

NSW

- Funding for the Jailbreak Project, aimed at providing hepatitis C information to inmates of correctional centres.

- Funding to the Department of Corrective Services to provide HIV/AIDS and hepatitis C health promotion services to inmates of NSW Correctional Centres.

- Prevention, education, health promotion, care, treatment and support, and surveillance programs delivered primarily within the public sector Justice Health (for inmates of NSW Correctional Centres and young people in custody of Juvenile Justice Centres).

Victoria

- Development of Prisoner Health Initiative to improve prevention, treatment & support activities relating to hepatitis C.

- Implementation of a pilot hepatitis B immunisation program in the two Victorian female prisons Dame Phyllis Frost Centre and Tarrengower Prison.

Queensland

- Sisters Inside: Women inside living and learning (including education and prevention).

5. Research projects

Victoria

- Development and implementation of an electronic data collection system to monitor needle and syringe programs' client demographics and usage of the service.
- Development and evaluation of a brief behavioural intervention for reducing hepatitis C virus risk practices among injecting drug users.
- Hepatitis A, B and C in Juvenile Justice clients in custody in Melbourne.
- An investigation of hepatitis C and commercial body piercing in Victoria.
- Psychological and social factors associated with uptake and maintenance of clinical treatment for hepatitis C.
- Determination of acute phase hepatitis C virus infection.
- Hepatitis C and initiation into injecting drug use in a rural setting.
- Review of hepatology nurse educators in Victorian liver clinics.

6. Care and support for people with hepatitis C.

Victoria

- Implementation of the Vein Care Program for Needle and Syringe Program clients. Victoria State Funded as of 2004-05.
- Development and piloting of an education intervention to reduce levels of discrimination experienced by people with hepatitis C when accessing health and community services.
- Provision of primary heath care service delivery to IDUs.
- Implementation of a pilot multicultural health & support service.
- Development and piloting of community based models of care for people accessing hepatitis C treatments.

Queensland

- Royal Brisbane and Women's Hospital Health Service District: Shared care project for hepatitis C.

Source: Data supplied by States and Territories

APPENDIX 9

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