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SAHA

NSW Health

**Economic Evaluation of the
Medically Supervised
Injection Centre at Kings
Cross (MSIC)**

August 2008

Final Report

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Executive Summary

Introduction

The Sydney Medically Supervised Injecting Centre (MSIC) was established in May 2001, in response to Recommendation 3.15 of the 1999 NSW Drug Summit. The Government agreed to support one trial of a medically supervised injecting centre in recognition of arguments put to the Drug Summit that the establishment of facilities of this kind will decrease overdose deaths, provide a gateway to treatment and reduce the problems of discarded needles and users injecting in public places.

Since its inception MSIC has been through two phases of evaluation which sought to assess the efficacy of the centre against its objectives and guide decisions on the future of the Centre's trial. On 7 June 2007, as part of the next phase of the trial, the Government agreed that an economic analysis of the Centre should be conducted in the context of the broader health budget.

As indicated in the brief:

“The aim of this study is to undertake a robust economic analysis of the Centre to determine the costs and benefits of the program in relation to the broader health budget in NSW as well as to any related government agencies and private enterprise.”

Methodology

Without seeking to replicate any of the previous analyses, our economic evaluation has placed particular emphasis on the alternative health budget costs which might be expected to be incurred for those patients currently serviced by MSIC. This methodology seeks to assess the alternative health costs which would be incurred to achieve, as far as possible, similar health outcomes as those currently provided by MSIC. The less tangible areas of benefit, such as public amenity, reduced drug related crime, and productive capacity to the economy, are not addressed directly. Instead, these less tangible costs are seen as an additional cost if MSIC were not in place. The only exception to this approach is the value of human life which is addressed separately as a stand alone sensitivity.

We have based our analysis on the actual service levels currently provided by MSIC and made a series of assumptions as to calls on other health sector activity for current MSIC clients if MSIC ceased to exist. Expressed simply, given we know what currently happens at MSIC, how many people use the facilities, and what their health outcomes are, if MSIC was no longer available then how could we achieve the same outcomes elsewhere in the health care system?

The major activities which we have assessed were:

- HIV and Hepatitis C Prevention: MSIC provides an environment where around 75,000 clean injections are undertaken each year. Without MSIC some of these injections would be with shared injecting equipment, thereby increasing the chance of new HIV and Hepatitis C (HCV) infections. Furthermore, without the education and treatment programs MSIC offers, the rate of needle and syringe sharing injecting behaviour is likely to deteriorate, leading to a compounded chance of HIV and HCV infection. Treatment of these new infections will cost the health care system substantial amounts over many years.

- **Overdoses:** MSIC currently treats overdose patients under protocols commensurate with NSW Ambulance and Health guidelines. Combined with the temporal immediacy of this treatment, MSIC has successfully treated every overdose in its history. Without MSIC, these services would have to be delivered through ambulance, emergency department, ICU and inpatient services. Furthermore, the absolute number of overdoses requiring treatment is estimated to be higher for the same user population.
- **Client and Referral Services:** In addition to providing injecting facilities, MSIC also offers general medical care and referral services to various treatment and other assistance programs. To deliver these same services in the absence of MSIC would require time from doctors operating privately or through emergency department attendance.
- **Police and Coronial Investigation of Fatal Overdoses:** MSIC has successfully treated over 2,000 overdose incidents since its inception. If these overdoses were to take place in an environment outside MSIC, it is likely that there would be a number of fatal overdose events. A drug overdose requires extensive Police and Coronial investigation in every case, all of which comes at a cost to Government.

Using our alternative cost methodology, a key issue is determining what cost we attach to each of these activity drivers. For the purposes of this evaluation, we have assumed that most health services have little spare operating capacity and that, as a consequence, the resources required to provide additional services, in this case for existing MSIC clients, are assumed to incur costs approximately equal to the average allocated costs. For some cost areas, the principle of opportunity cost was also employed. That is, if there are fewer services being administered as a result of MSIC's operations, then the resources which would otherwise be used are assumed to be directed elsewhere, not merely left idle, therefore providing an economic benefit at least equal to the average cost. For cost areas where there is recognised spare capacity and no realistic opportunity cost applicable, marginal costs are used.

Most economic evaluations refer to assessments of investment proposals and derive measures of economic worth in terms of the economic return on the investments over a nominated evaluation period. This particular evaluation is not concerned with capital investment. Rather, it is concerned with comparing the annual recurrent costs of MSIC with the costs which would be borne elsewhere in the health system to cater for MSIC's current clientele. On the basis that we have assumed similar health outcomes, the comparison may be viewed most simply on an annual basis, i.e. one year's MSIC operating costs compared with alternative health cost provision. To the extent that medical opinion believes that the closure of MSIC would actually lead to a deterioration in health outcomes and that differential alternative treatments would be longer lasting than one year, then the evaluation could be considered conservative. However, without significantly enhanced scope of work, we have confined our evaluation to an annual comparison and provided a range of potential alternative costs. This essentially represents a cost-effectiveness analysis, in this case to identify whether the costs of running MSIC are likely to be lower or higher than the provision of comparable health care services.

Results

Table ES 1, on the following page, presents a comparison of the estimated costs of running MSIC against the costs of providing a similar health outcome elsewhere in the health system for a representative comparison year.

Table ES.1: Base Evaluation Results for the Comparison Year

With/Without MSIC	Costs 2007/08 (\$000)
With MSIC Costs	2,770
Without MSIC Costs	
<i>HIV & HCV Infections</i>	1,740
<i>Client & Referral Services</i>	568
<i>Overdoses</i>	871
<i>Other Agencies</i>	250
Alternative Total	3,428
Cost Differential	- 658

The results in Table ES.1 indicate the following:

- On a with/without comparison of quantifiable costs to Government, MSIC saves \$658,000 over providing similar health outcomes, as currently achieved at MSIC, through other means in the health system
- Without MSIC in place, there would be significant costs to Government in the treatment of Overdoses and new HIV and HCV infections
- Alternative HIV and HCV Infections costs contribute most to the Without MSIC Costs, making up 50% of the alternative cost followed by Overdose costs at 25%
- This positive savings result from MSIC is likely to be an underestimate of its total net economic value given intangible costs are not measured in this evaluation; e.g. deterioration in health, reduced functionality, public amenity, drug related crime, and morbidity etc

While these base results indicate that the health outcomes provided by MSIC come at a lower cost to Government than the alternative, sensitivity testing of key parameters demonstrated that the bottom line result can vary significantly. Throughout this evaluation, emphasis has been given to the use of conservative assumptions. Unless a number can be strongly justified as being higher than some wider average, the more conservative number was chosen. In other instances, a mid-point between widely varying estimates was chosen. Given the soft nature of some of the assumptions involved and the fact that there is a limited amount of research in some areas, it could be argued that the base results of the evaluation are overly conservative. With this in mind, the sensitivities covered results either side of the base numbers. A series of highly conservative assumptions and some slightly relaxed assumptions, representing a “lowest estimate” and “highest estimate” scenario, were tested to help demonstrate the variability of the results to combined changes in key parameters. The comparative results can be seen on the following page in Table ES.2.

Table ES.2: Sensitivity Testing Results

Costs With/Without MSIC (\$000)	Highest vs Lowest Estimate Scenario		
	Lowest Estimate Scenario	Base Assumptions	Highest Estimate Scenario
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	660	1,740	3,710
<i>Client & Referral Services</i>	398	568	737
<i>Overdoses</i>	519	871	1,016
<i>Other Agencies</i>	111	250	586
Alternative Total	1,683	3,428	6,048
Cost Differential	1,087	- 658	- 3,278

Table ES.2 indicates that the most significant component is the values attached to HIV and particularly HCV infections. While the most conservative assumptions for each variable taken separately indicate that MSIC represents the least cost outcome, Table ES.2 indicates that, where the most conservative assumptions are selected for all the specified variables, then the optimal health outcomes currently provided by MSIC could only be achieved if Government incurred at least an extra \$1.1 million in annual health budget funding. Alternatively, should the already conservative base assumptions be relaxed slightly, to still justifiable numbers, for all the variables taken together, then the health outcomes provided by MSIC could only be matched elsewhere in the health system at an additional cost to Government of \$3.3 million.

Going beyond the base analysis, any assessment of the value of human life as a result of reduced morbidity from MSIC's operations, demonstrates an overwhelming positive outcome in economic terms. Taking a midpoint value of \$3.5 million per life, breakeven analysis reveals that MSIC's operations would have to prevent only 0.8 deaths per year to achieve a breakeven on the cost of operations. In other words, if it is believed that MSIC prevents at least 0.8 deaths per year then in economic terms it is a positive outcome. Extending this analysis to use the estimates of overdose related deaths prevented by MSIC in the given comparison year (25 prevented deaths x \$3.5 million per death) results in benefits of \$87.5 million. This covers the \$2.77 million operating costs of MSIC almost 32 times over.

The above analysis demonstrates that even conservative estimates of the number of deaths which MSIC may prevent each year results in massive positive outcomes in economic terms for the current funding of the Centre. It should be noted that this is before any other cost savings, as detailed in the base methodology of this report, are taken into account.

1 Introduction

1.1 Background and Objectives

The Medically Supervised Injecting Centre was established in Sydney in May 2001, in response to Recommendation 3.15 of the 1999 NSW Drug Summit. The Government agreed to support one trial of a medically supervised injecting centre in recognition of arguments put to the Drug Summit that the establishment of facilities of this kind will decrease overdose deaths, provide a gateway to treatment and reduce the problems of discarded needles and users injecting in public places.

Uniting Care ACT/NSW have been the licensees of the Centre at 66 Darlinghurst Road, Kings Cross, Sydney, since its establishment. Before issuing the licence, the responsible authorities had to be satisfied that there was a sufficient level of acceptance at community and local government level, for the establishment of an injecting centre at those premises.

NSW Health advise that there have been two phases of independent evaluation of the Trial.

The first evaluation covering the first 18 months of the Trial was undertaken by a consortium including researchers from the National Centre in HIV Epidemiology and Clinical Research, UNSW (NCHECR), the National Drug and Alcohol Research Centre, UNSW, and the NSW Bureau of Crime Statistics and Research. It reported in 2003 (MSIC Evaluation Committee, *Final report on the evaluation of the Sydney Medically Supervised Injecting Centre, 2003*). The first evaluation included a consideration of the economic costs and benefits of operating the Centre. This was reported in Chapter 9 of the 2003 Final report.

The second evaluation covering the last period of the Trial and continuing to address the key questions from the first evaluation, was undertaken by NCHECR. The National Centre released a series of reports:

- Interim Evaluation Report No. 1 *Operation and Service Delivery* (Nov 2002 to Dec 2004)
- Interim Evaluation Report No. 2, *Evaluation of Community Attitudes towards the Sydney MSIC*, (March 2006)
- Interim Evaluation Report No. 3, *Evaluation of Client Referral and Health Issues* (March 2007)
- Evaluation Report No. 4, *Evaluation of service operation and overdose-related events* (June 2007).

Evaluation Report No 4 included an examination of the operating costs of the Centre for the financial years 1999/00 to 2005/06. The objectives of the cost analysis were to quantify the service delivery costs; service facility costs; average cost per client visit; and to determine hourly costs and overall costs of the service. This analysis is found in Chapter 5 of Evaluation Report No. 4 (June 2007).

As part of the second evaluation, the NSW Bureau of Crime Statistics and Research also produced a Crime and Justice Bulletin on *Recent trends in property and drug-related crime in Kings Cross* (No. 105) in November 2006.

The Drug Summit Legislative Response Amendment (Trial Period Extension) Act 2007, which provides for a further extension of the Trial to 31 October 2011, commenced on assent on 4 July 2007.

On 7 June 2007, as part of the next phase of the Trial, the Government agreed that an economic analysis of the Centre should be conducted in the context of the broader health budget.

As indicated in the brief:

“The aim of this study is to undertake a robust economic analysis of the Centre to determine the costs and benefits of the program in relation to the broader health budget in NSW as well as to any related government agencies and private enterprise.”

1.2 Structure of the Report

The remainder of this report consists of the following sections:

- Chapter 2: Evaluation Approach
- Chapter 3: Measurement of Costs and Benefits
- Chapter 4: Economic Appraisal

2 Evaluation Approach

We have reviewed a series of data sources, comprising different reports on MSIC, particularly those undertaken by NCHECR and information provided by InforMH. However, we note that this evaluation is not designed to replicate previous analyses. Neither is it focused on a wide-ranging assessment of MSIC in medical terms. The remit for this evaluation is more narrowly focused as outlined at the end of section 1.1 above. The particular emphasis of this economic evaluation is on an assessment of the savings in other health sector costs which could be expected not to occur in the absence of MSIC.

Discussions about estimates of the value of human lives saved which could be attributable to MSIC remains a contentious issue, not only in terms of the number of lives which might be saved but also in terms of agreed estimates about the value of a statistical life. In simple terms, the value of statistical life varies across jurisdictions depending on methodological treatment, but could be viewed as somewhere between \$2 million and \$5 million. On this basis, a claim that MSIC saved on average one life per annum would be enough to cover its annual operating costs. Therefore, we have confined our base analysis to the specific areas outlined in the brief and presented the results of incorporating the value of human life saved as a sensitivity test.

The base evaluation methodology we have developed focuses substantially on the alternative health budget costs which might be expected to be incurred for those patients currently serviced by MSIC. In essence, this seeks to assess the alternative health costs which would be incurred to achieve, as far as possible, similar health outcomes as those currently provided by MSIC. In many cases, this has required professional judgments about alternative medical treatment and the likely propensity of patients to access such treatment. However, we believe that this assessment is potentially less problematic than assessments of lives saved and their values. The major issue is whether the quality of health care provided by MSIC would in fact be taken up by patients elsewhere in the absence of MSIC. Given the extensive range of services offered by MSIC, MSIC management is of the strong view that the health care outcomes would be worse in the absence of the MSIC. In large part, this is because its client base comprises the most vulnerable drug users in terms of drug frequency and behaviours. As a result, they would be less likely to avail themselves of alternative services: for example, ambulance protocols indicate that drug overdose cases should be hospitalised for observation but the majority of such cases refuse to be hospitalised. While this could be viewed as a cost saving to the health budget, at least in the short term, it is considered to be associated with poorer health outcomes which occasion a demand for a higher level and greater frequency of treatment later, incurring higher health costs, or even earlier cases of death.

In order to compare “like with like”, we have compared the service levels and costs as provided by MSIC with those which could be expected to be incurred by other parts of the health system for broadly comparable levels of care. We believe that it would be unreasonable to compare MSIC costs with alternative health costs if a lower level of health care outcome would have been expected: this would mean that a higher level of fatalities or increased morbidity would lead to lower costs and therefore would be preferable. This perverse logical outcome runs counter to general health and social welfare policy objectives. Rather than debate this issue, our comparative analysis assumes, as far as can be reasonably agreed based on professional advice, broadly similar health outcomes.

In essence then, although we postulate that, in the absence of MSIC, the user population will not actually receive a similar health outcome, our analysis can be seen to place a proxy value on the resulting deteriorating health outcomes of those MSIC users who can no longer avail themselves of its services. By

not receiving the premium care afforded by MSIC, the user population will have higher levels of morbidity and poorer general health. The proxy value of this deterioration in health outcomes is then the equivalent cost to achieve a similar health outcome from services provided elsewhere in the system. This value is likely to be conservative given the values usually attached to life and well being.

Given that there would be a range of possible costs depending on the health outcome assumptions, our analysis has constituted a range of potential costs.

We have based our analysis on the actual service levels currently provided by MSIC and made a series of assumptions as to calls on other health sector activity for current MSIC clients if MSIC ceased to exist. The major activities which we have assessed were:

- Needle and Syringe Program – while MSIC is not equated with NSP, MSIC was of the view that, in its absence, there would be a higher amount of needle sharing, based on stated behaviour of its clients when registering. This in turn could be expected to lead to a higher incidence of Hepatitis C and HIV patients introduced into the health system. The benefits to MSIC would represent the costs saved for the difference in the numbers who failed to use a clean needle and syringe if MSIC did not exist.
- Overdoses – we assumed that, in the absence of MSIC, the overdose cases currently treated by MSIC would have required ambulance calls and treatment, and some of them would have required further hospitalisation, whether emergency department, ordinary inpatient or ICU activity. Furthermore, MSIC considered that the incidence of overdoses would be higher if it ceased to exist and therefore the number of ambulance calls would be correspondingly higher. The benefits to MSIC represent the avoidance of costs associated with ambulance and hospital activity.
- Alternative client services – these include a range of clinical, general medical and psycho-social services. In the absence of MSIC, we have assumed that these services would generally be provided by general practitioners although in practice a number might be provided by hospital emergency departments and others not provided at all, leading *prima facie* to later increased adverse outcomes. The benefits to MSIC of these services would constitute avoided costs of being provided elsewhere.
- Alternative referral services – these include referrals to a range of drug treatment, health care and psycho-social services. These referrals are particularly time-consuming as they frequently require a lengthy one-on-one consultation and many phone calls on the spot before satisfactorily ensuring that the patient has been successfully referred to the required service. We have been advised that general practitioners have been increasingly unwilling to be involved in the provision of these services to drug users and alternative sources of referral to MSIC in practice would be difficult to access. Nonetheless, consistent with our broad evaluation approach, we have assessed the cost of providing these services in the absence of MSIC.

Most of the cost data which we have cited represent average costs per service or incident. The estimates are generally taken from total budget or actual annual costs divided by the number of services or activities provided. As average costs, these represent accounting costs with an average allocation across all services. From an economic viewpoint, the major issue is whether the removal of particular services would lead to cost reductions or would the same body of costs be averaged over a slightly lower number of services, thereby raising the average allocation. What we want to establish are the avoidable costs if particular services are not incurred or, which is the same thing, the incremental costs if additional services are now provided. The answer to this question is complex and depends in part on differences between fixed and variable costs and on utilisation levels. If all costs were fixed and there was significant excess capacity, it would be reasonable

to assume that no costs would be saved without the removal of some services; by the same token, under this scenario, additional service provision would not lead to cost increases. At the other extreme, if all costs were variable and there was full capacity, it would be reasonable to assume that additional services would incur costs at least at the same level as existing services.

For the purposes of this evaluation, we have assumed that most health services have little spare operating capacity and that, as a consequence, the resources required to provide additional services, in this case for existing MSIC clients, are assumed to incur costs approximately equal to the average allocated costs. For some cost areas, the principle of opportunity cost was also employed. That is, if there are fewer services being administered as a result of MSIC's operations, then the resources which would otherwise be used are assumed to be directed elsewhere, not merely left idle, therefore providing an economic benefit at least equal to the average cost. For cost areas where there is recognised spare capacity and no realistic opportunity cost applicable, marginal costs are used. The impact of any increased workload on the health system in broad terms translates either in delayed treatment for other potential users or ultimately in the establishment and provision of additional facilities. As part of this evaluation, we are not in a position to adjudicate on the specific system impacts in terms of future investment decisions. We have assumed that existing services across the health system would be able to cater for the additional requirements associated with MSIC's current clientele.

The major thrust of this economic evaluation has been on alternative health costs. However, the terms of reference also refer to other agency costs. This particularly refers to police and criminal justice costs. Our review of available statistics and literature does not provide a clear picture on the level of law and order costs associated with drug-related crime. Furthermore, this specific evaluation is only concerned with differential costs attributable to MSIC, and here again there is little hard statistical evidence. The 2003 evaluation acknowledged the difficulty of identifying and measuring likely police service cost offsets and assumed a proportion of overdose events involved a police response. For this evaluation we have taken a different approach and attempted to estimate the Police and Coronial costs of a fatal overdose.

Most economic evaluations refer to assessments of investment proposals and derive measures of economic worth in terms of the economic return on the investments over a nominated evaluation period. This particular evaluation is not concerned with capital investment. Rather, it is concerned with comparing the annual recurrent costs of MSIC with the costs which would be borne elsewhere in the health system to cater for MSIC's current clientele. On the basis that we have assumed similar health outcomes, the comparison may be viewed most simply on an annual basis, i.e. one year's MSIC operating costs compared with alternative health cost provision. To the extent that medical opinion believes that the closure of MSIC would actually lead to a deterioration in health outcomes and that differential alternative treatments would be longer lasting than one year, then the evaluation could be considered conservative. However, without significantly enhanced scope of work, we have confined our evaluation to an annual comparison and provided a range of potential alternative costs. This essentially represents a cost-effectiveness analysis, in this case to identify whether the costs of running MSIC are likely to be lower or higher than the provision of comparable health care services.

3 Measurement of Costs and Benefits

This chapter discusses the different costs for services. Benefits are viewed as avoided costs as a result of MSIC.

3.1 MSIC Operating Costs

MSIC was originally established in 2001 and its first budget included some establishment costs. Thereafter, its annual recurrent costs have been mostly explained by wage and salary expenses, rent and supporting expenses.

Table 3.1 provides a summary of MSIC's operating costs for each financial year since its inception.

Table 3.1: MSIC Annual Operating Costs (\$000)

Expenses \$000	2000/01 Actual ⁽¹⁾	2001/02 Actual	2002/03 Actual	2003/04 Actual	2004/05 Actual	2005/06 Actual	2006/07 Actual
Staff	330	1,001	1,228	1,427	1,508	1,641	1,727
Property	685	448	466	411	404	415	470
Program	51	131	145	297	251	299	324
Compliance	38	18	(18)	7	6	2	7
Overhead	153	133	122	107	167	138	106
Total	1,257	1,730	1,943	2,249	2,336	2,495	2,633

Notes: ⁽¹⁾ part year, as MSIC opened in May 2001, and included establishment costs

Source: Uniting Care Statements of Income and Expenditure

This table indicates that, after allowing for inflation adjustments and initial ramp-up activity, annual costs for MSIC have been relatively constant. As the number of services and clients has increased over the years, this effectively means that MSIC is now enjoying economies of scale which were not available in its early years. For 2007/2008 NSW Health advised that MSIC was paid an estimated total of \$2,770,000. This increase, of around 5%, on the previous year is consistent with past MSIC budget variations. Additionally, NSW Health advised that the amount for 2007/08 was open to possible adjustments, either up or down, resulting from the outcome of rental value negotiations which have yet to be concluded. Indications to date, however, suggest that there is unlikely to be any material change to the 2007/08 payment of \$2,770,000.

For the purposes of this evaluation, we have therefore used the actual costs for 2007/08 (\$2,770,000) as the basis for comparison.

3.2 Alternative Health Costs for HIV and Hepatitis C Infection

The approach to evaluating the alternative health costs for HIV and Hepatitis C (HCV) infection is driven by the likely change in the prevalence of needle sharing behaviour should the services MSIC provides no longer be available. This headline cost is made up of two distinct elements:

1. Lifetime healthcare costs of new HIV and HCV infections
2. Transfer of needle and syringe exchange services to other centres

Table 3.2, on the following page, provides a summary of the alternative costs without MSIC for the compassion year.

Table 3.2: Alternative Health Costs for HIV and HCV Infection

Cost Element	Without MSIC	Unit Cost	Alternative Cost
HIV Infections	0.62	\$289,674	\$178,863
HCV Infections	139	\$10,276	\$1,424,203
Needles and Syringes	153,292	\$0.89	\$136,430
Total			\$1,739,496

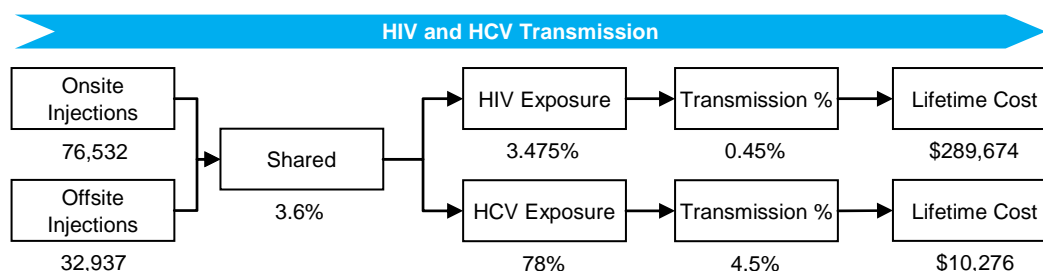
Table 3.2 indicates that, without MSIC, there will be substantial alternative costs in the region of \$1.74 million borne by the health care system per year. The underlying assumptions and metrics for each of these cost elements are discussed below in more detail.

3.2.1 Alternative Health Costs for HIV and HCV Infection

All injections at MSIC are conducted with a clean needle and syringe, under supervision and with no incidence of sharing. In the absence of MSIC, however, a proportion of these injections would be made with shared needles and syringes. Additionally, MSIC dispenses a large number of needles for users to take away from the Centre for offsite injections, as per a regular NSP. As with the onsite injections, without MSIC in place, a portion of these offsite injections would be made with shared needles. Without the educational and awareness programs at MSIC the user base would be less likely to use clean needles. A direct result of this change in needle sharing behaviour will be increased incidence of HIV and HCV infection in the user population.

Figure 3.1 below provides an overview of the methodology used to estimate the alternative health costs for HIV infection.

Figure 3.1: Estimation Methodology for HIV and HCV Transmission



The basic premise of this methodology is that, given that no injection at MSIC is shared, if the same number of injections were made without MSIC, a number of these would be shared and, as a consequence, there would be potential for new cases of HIV and HCV infection. Furthermore, the contribution of MSIC to improved injecting behaviour by its users outside the Centre means that, without MSIC, a proportion of offsite injections will be with shared needles. The assumptions and calculations involved in each step of this methodology are discussed in detail below.

3.2.1.1 Number of injections for the comparison year

It was estimated that 76,532 onsite and 32,937 related offsite injections would occur in the comparison year without MSIC. The methodology used to calculate the number of onsite injections was the same as that used

for estimating overdose costs (see Section 3.2.1). The calculation of offsite injections was based on the number of needles and syringes MSIC dispenses to users to take away from the premises.

The number, 76,532, is likely to be a highly conservative estimate for the total number of injections that the MSIC user population would undertake in a given year. MSIC only records injections at the Centre. There are no reliable estimates for the number of injections that the MSIC users undertake outside the Centre. Furthermore, the estimate of 76,532 does not take account of any impacts MSIC may have on the wider injecting behaviour of its user population through the education and treatment programs offered. In the absence of MSIC it is likely that, for the same number of users, they would inject more frequently.

To take account of these impacts of MSIC on the injecting behaviour of the user base, a simple estimate of related offsite injections was made. In the calendar year 2007, 46,112 needles and syringes were dispensed to MSIC users to take from the premises. Using the ratio of needles and syringes dispensed for onsite use to the number of actual onsite injections, we arrive at a result of 1.4 needles per injection (106,880 / 76,532).¹ As identified in Evaluation Report No. 4, the fact that more than one needle is used per injection is explained by faulty needles, syringes and breakage. Applying this ratio to the 46,112 takeaway needles leads to an estimate of 32,937 offsite injections (46,112 takeaway needles / 1.4 needles per injection).

A total of 109,469 injections are therefore estimated in the comparison year.

3.2.1.2 Prevalence of needle and syringe sharing among MSIC users

It was estimated that for every injection there is an approximately 3.6% chance that it will be with a shared needle and syringe.² Therefore, with 109,469 injections in the comparison year, 3,941 will be with shared needles.

NCHECR provided data and references which demonstrated that, in the general IDU population, 15% to 20% of users share needles and syringes and, of those users, 13% to 18% of their total injections involve shared needles and syringes.³ Given the MSIC user population represents some of the most marginalised IDUs, it was assumed that sharing rates among MSIC users are likely to be in the higher end of the range. Interviews with MSIC and Kirketon Road staff further reinforced this view with suggestions that, without MSIC, the sharing behaviour of the user base could worsen by as much as 20%.

Based on the above data, a needle sharing rate of 3.6% was assumed for the MSIC user population (20% users x 18% sharing).

3.2.1.3 HIV and HCV exposure

It was estimated that for every shared injection there is a 3.475% risk of being exposed to an HIV infection and 78% chance of being exposed to a HCV infection. Applying these exposure rates to the 3,941 shared needles, we arrive at exposure incidents of 137 for HIV and 3,080 for HCV.

¹ Sydney Medically Supervised Injecting Centre Evaluation Report No. 4: Evaluation of service operation and overdose-related events, NCHECR for the NSW Department of Health, June 2007, see also Section 3.5.2 for information on needles and syringes dispensed at MSIC.

² Calculation based on research references provided by NCHECR – see Section 3.5.1.2

³ Iversen J, Maher L, Topp L. on behalf of the Collaboration of Australian Needle and Syringe Programs, *The National NSP Survey: 1995-2006 National, NSW and KRC/K2 trends*

For every shared needle, the risk of contracting HIV or HCV is dependent on whether the needle was shared with a currently infected person. In other words, what is the risk of being exposed to an infected needle? Exposure risk is driven by prevalence rates amongst the user population.

A number of sources were reviewed to help estimate HIV and HCV infection rates for the regular MSIC user base. The first data source examined was collected directly by MSIC. Protocol at MSIC requires each new attendee to complete a survey detailing basic information and drug use history. Amongst the data collected are HIV and HCV infection rates. Of the almost 10,000 users who have registered at MSIC since its inception, 2% of users respond positive to HIV and 50% positive to HCV.⁴ An important observation about this figure is the fact that the MSIC registration survey relies on self reporting and is not anonymous. Self reporting and lack of anonymity are acknowledged as contributing to an underestimation of infection rates. As such, these figures of 2% and 50% are considered a conservative number and a likely underestimation.

Other data sources which contain estimates for HIV infection rates amongst IDU populations ranged from 1.525% (a 10 year National average from NSP data) to as high as 7.7% (a single year's data from blood tests at the Kirketon Road Centre NSP in Kings Cross).⁵ HCV infections ranged from 62% (National NSP survey average in 2006) to as high as 87% (2006 blood test data at Kirketon Road Centre NSP Kings Cross).

Given the inherent problems with the lack of anonymity and the self reporting nature of the MSIC registration data, for two reasons it was considered that the most accurate approximation for actual HIV infection rates in the MSIC user population would come from site specific NSP survey data collected at the Kirketon Road Centre NSP program in Kings Cross. Firstly, the close geographical location of MSIC and Kirketon Road. The two centres are within 200 metres of each other and, based on the professional judgement of staff at the centres, there is a high degree of crossover between attendees at the two locations. Therefore, any results at Kirketon Road would likely be a close approximation for those users who attend MSIC. Secondly, the NSP data is based on blood samples thereby avoiding the problems associated with self reporting. Considering these two points, the data from Kirketon Road revealed that, over 10 years of testing between 1996 and 2006, the average HIV infection rate reported was 3.475%. This is notably higher than the 2% reported via the MSIC registration survey. HCV infection rates at Kirketon Road averaged out at 78% in the last four years reported. Again this result is higher than the MSIC survey data and, in addition, both the National (62%) and NSW (70%) rates recorded in the NSP survey.⁶

Considering the above, HIV and HCV infection rates were assumed to be commensurate with the Kirketon Road data, i.e. 3.475% for HIV and 78% for HCV.

Applying these exposure risk rates to the 3,941 shared needles, we arrive at exposure incidents of 137 for HIV and 3,080 for HCV.

3.2.1.4 HIV and HCV transmission risk

Sharing an infected needle does not guarantee a transmission of the disease. Whether, once being exposed to an infected needle, a person actually contracts the virus is dependent on the transmission risk. NCHECR

⁴ *Sydney Medically Supervised Injecting Centre Evaluation Report No. 4: Evaluation of service operation and overdose-related events*, NCHECR for the NSW Department of Health, June 2007, p.15

⁵ *Op cit* at 9

⁶ NCHECR, University of NSW, *Australian NSP Survey National Data Report 2003-2007 Prevalence of HIV, HCV and Injecting and Sexual Behaviour Among IDUs at Needle and Syringe Programs*, May 2008

provided references for HIV and HCV transmission risk leading to estimates of 0.45% for HIV and 4.5% for HCV.⁷ So, for each sharing incident where a person is exposed to an HIV or HCV infected needle, there is a 0.45% chance they will actually contract HIV and a 4.5% chance they will contract HCV.

Applying these transmission risks to the number of HIV and HCV exposures estimated at 3.5.1.3 above results in 0.62 new HIV infections and 139 HCV infections in the comparison year.

3.2.1.5 Lifetime health care costs of treating HIV and HCV infections

Health care costs for HIV and HCV infection are incurred over a number of years. In any given year, the costs of HIV and HCV treatment do not represent the total cost to Government of a new infection. Therefore, when looking at the number of infections in a given year, a “lifetime” health care cost must be calculated. These costs represent the lifetime treatment costs of an infection discounted back to today’s dollars.

For HIV the lifetime health care cost in Australia has been estimated at anywhere from \$151,000⁸ to \$250,000⁹ and even as high as \$406,000.¹⁰ In 2003 HCV costs were estimated at \$6,243 per infection. A 2008 study commissioned by the AIDS and Infectious Diseases Unit at NSW Health estimated that, over a given year, \$28 million of inpatient related HCV costs are incurred in NSW hospitals. Based on a diagnosed population of 97,844, of whom only 2% seek treatment per year, this would lead to a cost estimate of \$14,308 per year (\$28 million / [97,844 x 2%]).¹¹ As this figure only accounts for hospital related costs it is likely to be highly conservative, with significant outpatient monitoring and psycho social support also incurred for HCV patients.

Taking the midpoint of the estimates and adjusting by CPI, lifetime health care costs of \$289,674 for HIV and \$10,276 for HCV are derived.

Applying these cost estimates to the number of new HIV and HCV infections in the comparison year results in lifetime health care costs of \$178,863 for HIV and \$1,424,203 for HCV.

3.2.2 Needle and Syringe Dispensing Costs

In addition to providing supervised safe injecting facilities and health care services, MSIC also conducts a Needle and Syringe Program (NSP). NSP programs are a national scheme for providing clean injecting equipment on an anonymous basis. Our analysis assumes that, without MSIC, the user base will still obtain

⁷ 1.Cavalcante NJ, Abreu ES, Fernandes ME, Richtmann R, Piovesana MN, Yamada FT, et al. Risk of health care professionals acquiring HIV infection in Latin America. *AIDS Care*. 1991;3(3):311-6.
 2.Gerberding JL. Incidence and prevalence of human immunodeficiency virus, hepatitis B virus, hepatitis C virus, and cytomegalovirus among health care personnel at risk for blood exposure: final report from a longitudinal study. *J Infect Dis*. 1994 Dec;170(6):1410-7.
 3. Ippolito G, Puro V, De Carli G. The risk of occupational human immunodeficiency virus infection in health care workers. Italian Multicenter Study. The Italian Study Group on Occupational Risk of HIV infection. *Arch Intern Med*. 1993 Jun 28;153(12):1451-8.
 4.Nelsing S, Nielsen TL, Nielsen JO. Occupational exposure to human immunodeficiency virus among health care workers in a Danish hospital. *J Infect Dis*. 1994 Feb;169(2):478.
 5. Tokars JI, Marcus R, Culver DH, Schable CA, McKibben PS, Bandea CI, et al. Surveillance of HIV infection and zidovudine use among health care workers after occupational exposure to HIV-infected blood. The CDC Cooperative Needlestick Surveillance Group. *Ann Intern Med*. 1993 Jun 15;118(12):913-9.
 6.Short LJ, Bell DM. Risk of occupational infection with blood-borne pathogens in operating and delivery room settings. *Am J Infect Control*. 1993;21(6):343-50.
 7. Gerberding JL. Management of Occupational Exposures to Blood-Borne Viruses. *New England Journal of Medicine*. 1995;332(7):444.
 8. MacDonald M, Crofts N, Kaldor J. Transmission of hepatitis C virus: rates, routes, and cofactors. *Epidemiol Rev*. 1996;18(2):137-48.
 9. Kiyosawa K, Sodeyama T, Tanaka E, Nakano Y, Furuta S, Nishioka K, et al. Hepatitis C in hospital employees with needlestick injuries. *Ann Intern Med*. 1991 Sep 1;115(5):367-9.
 10. Mitsui T, Iwano K, Masuko K, Yamazaki C, Okamoto H, Tsuda F, et al. Hepatitis C virus infection in medical personnel after needlestick accident. *Hepatology*. 1992 Nov;16(5):1109-14.
 11. Sodeyama T, Kiyosawa K, Urushihara A, Matsumoto A, Tanaka E, Furuta S, et al. Detection of hepatitis C virus markers and hepatitis C virus genomic-RNA after needlestick accidents. *Arch Intern Med*. 1993 Jul 12;153(13):1565-72.
⁸ Economic Evaluation of Hepatitis C in Australia, Department of Health and Ageing, August 2005
⁹ Peter Papadopoulos, *Migration law and HIV/AIDS: “A door closes, but a window opens”*, Australian Federation of AIDS Organisations
¹⁰ NSW Health, *Impact of HIV/AIDS in NSW – Mortality, Morbidity and Economic Impact*, 2007
¹¹ Review of Hepatitis C Treatment and Care Services, January 2008, Hardwick Consulting for AIDS and Infectious Diseases Unit of NSW Health, pp. 11-13

clean injecting equipment at other centres. Therefore, the cost of needles and syringes currently provided by MSIC will be transferred to another NSP location. It should be noted that the changes in HIV and HCV infection (see 3.5.1 above) driven by needle sharing are related to changes in behaviour due to MSIC being closed down, not directly to the ability to obtain clean injecting equipment.

MSIC provides needles and syringes to its clients both to take from the premises and to use onsite.

MSIC records show that, over the six years to April 2007, 205,392 needles and syringes were dispensed to take from the premises. This averages out at 34,232 per year although, after an initial ramp up, this has stabilised at around 46,000 needles per year.¹² The latest data for the calendar year 2007 revealed that 46,412 needles were dispensed.¹³

Records of needles and syringes dispensed for onsite use were collected over the years 2004 to 2006. The data showed that on average 106,820 needles were dispensed in each of the three years.

By combining the 2007 “takeaway” data and the average onsite needle dispensation numbers, we can estimate that, for our comparison year, 153,232 needles and syringes will be dispensed.

NSW Health provided cost data on needle and syringe distribution which indicated that the average cost per needle, dispensed from an NSP centre, in NSW in 2006/07 was \$0.86. As the injecting equipment makes up the majority of the cost of dispensation, it was assumed that average cost was approximate to marginal cost in this instance. Adjusting by CPI, this results in an estimated cost per needle and syringe in 2008 of \$0.89.

Applying this cost estimate of \$0.89 to the 153,232 needles and syringes dispensed in the comparison year results in an estimate of \$136,430 which would be incurred elsewhere in the absence of MSIC.

3.3 Alternative Health Costs for Overdoses

In the six years of MSIC’s existence to April 2007 (covered by the last NCHECR evaluation report), 2,106 overdoses were successfully treated at the Centre. Of these overdose incidents there have been no cases of morbidity. Achieving a similar health outcome, as far as is possible, without MSIC in place would require additional ambulance, hospital emergency department, intensive care, and inpatient resources. These services come at a cost to Government and represent the alternative health costs that will be borne by the system without MSIC in place.

Table 3.3, on the following page, provides a summary of the overdose related health costs “without MSIC” for the comparison year.

¹² *Op cit* at 9

¹³ 2007 MSIC data extracted by Allison Salmon at NCHECR

Table 3.3: Overdose Related Health Costs for the Comparison Year

Treatment Stage	With MSIC	Without MSIC	Alternative Cost (\$000)
Injections	76,532	76,532	
Overdose Rate	0.54%	0.654%	
Overdoses	413	496	
Ambulance Rate	N/A	100%	\$600 per call out
Call Outs	N/A	496	\$297,556
Morbidity Rate	0%	4%	
Morbidity	0	20	
ED Rate	N/A	95%	\$691 per incident
ED Attendance	N/A	447	\$308,943
Inpatient Rate	N/A	17.5%	\$3,242 per admission
Inpatient Cases	N/A	78	\$264,125
Total			\$870,625

The above table indicates that, without MSIC in place, a total of \$870,625 will have to be borne elsewhere in the health system to achieve similar health outcomes for overdose incidents which would otherwise be treated at MSIC in the comparison year. This alternative cost to the health system is further compounded by the fact there will be a higher propensity to overdose per injection for the same user population currently attending MSIC.

The overdose treatment currently administered at MSIC is commensurate with NSW Ambulance and health guidelines. In the event of an overdose, Narcan is immediately administered and the patient stabilised. The patient is then held, voluntarily, for four hours of observation or until the doctors' deem them safe to leave. This treatment, importantly the early intervention, is considered optimal care for overdose incidents.

Without MSIC in place, achieving a similar health outcome, as far as is possible, would require ambulance attendances at each overdose, subsequent admission for up to 4 hours of observation at a hospital Emergency Department, and then inpatient admission for the more serious overdoses. It is this alternative treatment course which drives the \$870,625 in costs that would have to be incurred by the health system.

The assumptions and calculations driving the above measurements will be discussed in turn below.

3.3.1 Number of Injections for the Comparison Year

The estimated number of overdoses for the comparison year was driven by the total number of injections expected in that year. Given data on propensity to overdose per injection was accurate and readily available, this was considered the most appropriate approach as opposed to taking a simple average number of overdoses per year over the life of MSIC. Table 3.4, on the following page, summarises the estimate for number of injections in the comparison year.

Table 3.4: Injecting Incidents for the Comparison Year Summary

2007 Av. Per Day	Days Per Year	Injecting Incidents
212	361	76,532

In the six years to April 2007, 391,170 injecting incidents were recorded at MSIC with an average 181 daily rising to 212 in the last year. After an initial ramp up, attendance at MSIC stabilised around 2004 and has grown slightly since. During this time MSIC was open for 361 days each year. Based on the above the number of injecting incidents in the comparison year was estimated to be 76,532 (212 per day x 361 days of operation).

Given the holistic care provided by MSIC, the number of injections for the same user population would likely be higher if the Centre were not available. While this may be a reasonable assumption, it was not possible to estimate if the number of injections would be greater without MSIC in place. This final figure of 76,532 could therefore be considered a conservative estimate.

3.3.2 Overdose Incidents in the Comparison Year

The estimate of overdose incidents is driven by the propensity to overdose per injection. Table 3.5 below provides a summary of the estimated number of overdose incidents for the comparison year.

Table 3.5: Overdose Incidents for the Comparison Year Summary

Injecting Incidents	Overdose Rate	Overdoses
76,532	0.654%	496

Based on the six years of operations at MSIC, the propensity to overdose per injection averaged out at 0.54% i.e. for every injection at MSIC, there was a 0.54% chance of an overdose.¹⁴ For the 76,532 estimated injections in the comparison year, this equates to 413 overdoses. This number, however, is likely to be an underestimate of the number of overdoses that would occur if the same 76,532 injections were to take place outside of MSIC.

MSIC provides a safe and clean injecting environment coupled with advice on dosage, vein care and other injecting related procedures. In other words, MSIC is the safest environment in which to inject. As such, any propensity to overdose based on incidents at MSIC itself is likely to be significantly less than in an alternative location. The fact that MSIC caters to the most marginalised drug users would only compound this observation. This is highlighted by the third NCHECR Evaluation Report where a survey of MSIC users found that 75% would inject in public if MSIC were not available to them. A public injection is considered to have a three times higher likelihood of resulting in an overdose than a private injection.

To estimate the extent of this impact on the propensity to overdose, a meeting with MSIC and Kirketon Road staff lead to a judgement that, if MSIC were not available, the propensity to overdose would increase by 20%. This would change the 0.54% observed at MSIC to 0.654% (0.54% x 1.2).

Therefore, without MSIC in place, there would be a total of 496 overdoses for the same number of injections (0.654% x 76,532).

¹⁴ Sydney Medically Supervised Injecting Centre Evaluation Report No. 4: Evaluation of service operation and overdose-related events, NCHECR for the NSW Department of Health, June 2007, p.7

3.3.3 Ambulance Call Outs

To achieve a similar health outcome for the 496 overdoses as if they had occurred with MSIC in place, each overdose incident must receive an ambulance call out and appropriate treatment. Table 3.6 below summarises the alternative health costs related to these ambulance call outs.

Table 3.6: Ambulance Call Outs Cost Summary

Overdoses	Call Out Rate	Cost Per Call Out	Total
496	100%	\$600	\$297,556

As mentioned previously the treatment administered at MSIC is in line with NSW Ambulance and health protocols. Therefore, except for the temporal difference between the immediate intervention at MSIC and some average ambulance response time, the equivalent treatment and relevant cost is that for an ambulance call out.

As 100% of overdoses at MSIC receive treatment, a similar health outcome via ambulance call out would require 100% of our 496 overdoses to be attributed an ambulance call out.

The average cost of an emergency road ambulance call out in Australia has been estimated, at various times, to be between \$500 and \$600. It was further suggested that attendance at an overdose was considered to be more costly, both in terms of time and services administered, than the average call out and therefore these average figures would be an underestimate of actual overdose call out costs. Particular analyses of ambulance costs related to drug overdose have found that costs per call out tend to be in the upper range. Dietze, Cvetkovski et al. calculated that ambulance costs averaged \$600 per overdose call out (in year 2000 dollars).¹⁵ Adjusting these values to 2008 at CPI would lead to a cost per call out of \$780 (30% increase the index between 2000 and 2008).¹⁶

While research and anecdotal evidence would suggest that the cost of an overdose call out is higher than an average call out, it was decided that, without any more specific investigation into costs in the Kings Cross area, to use an average cost of \$600 per call out. This estimate is specifically based on a CPI indexed cost of \$520 in 2003/04 dollars as reported in a 2005 IPART report.¹⁷

When considering the costs of an ambulance call out it was suggested that the actual costs of avoiding a call out are going to be lower than average cost. The reasons given were that the service has some spare capacity and that, even if an ambulance call out were avoided, the resources could not be immediately directed to other demands. Therefore, a marginally reduced number of ambulance call outs, when viewed against the total ambulance task, may not lead to a significant reduction in fixed costs. Countering this argument, however, is a recent Performance Review of the NSW Ambulance Service undertaken by the NSW Department of Premier and Cabinet. The report found that while the service had managed, on the whole, to accommodate recent increases in workloads, resources were potentially stretched for emergency work.¹⁸ Therefore there may in fact be little spare capacity to deal effectively with increased overdose attendances. This would suggest the cost of this additional workload would be closer to average cost estimates.

¹⁵ Dietze, P.M., S. Cvetkovski et al. (2000). *Ambulance attendance at heroin overdose in Melbourne: the establishment of a database of Ambulance Service records*. Drug and Alcohol Review 19: 27–33.

¹⁶ 6401.0 Consumer Price Index, Australia, Australian Bureau of Statistics

¹⁷ IPART, *Review of Financial Aspects of the Ambulance Service of NSW*, November 2006, Table A3.1, p.57

¹⁸ *Performance Review, Ambulance Service of NSW*, Performance Review Unit NSW Department of Premier and Cabinet, June 2008

Given the incidences of overdoses in the Kings Cross area, we are unable to assess whether there would be any changes in ambulance service provision if MSIC ceased to exist. However, in the absence of firm advice about ambulance operations, we have assumed, for the purposes of this evaluation, the average cost of \$600 per call out. To take account of the potentially lower costs, we have undertaken a sensitivity test of a call out of \$100, incorporating an estimate only of the cost of Narcan and marginal vehicle costs.

The alternative health cost of this first step in treating the 496 overdoses was therefore estimated to be \$297,556 (\$600 per call out x 496 call outs).

3.3.4 Morbidity

Of the 2,106 overdoses treated at MSIC to April 2007 there was not one related death. General estimates for rates of morbidity in the event of an overdose range from as high as 1 in 10 (10%) to 1 in 25 (4%). The latest research published by the Australian National Council on Drugs estimates a 1 in 20 (5%) ratio of fatal to non-fatal overdoses.¹⁹

The success of MSIC in avoiding a single overdose related death has been attributed to the optimum treatment received by users, specifically the early intervention and administration of Narcan. As this same temporal immediacy would be impossible to achieve through Ambulance call outs alone, an increased morbidity rate for the without MSIC overdoses was applied.

Using a 5% morbidity rate, from the Australian National Council on Drugs research, this would lead to 25 fatal overdoses among the 496 overdoses estimated in the comparison year.

In terms of health system costs a death has the perverse effect of reducing costs to the system. However, costs of death, especially overdose related deaths, fall on the NSW Police and Office of the State Coroner. These non-health care costs are discussed in Section 3.6 below. The impact of fatal overdoses on health care costs then is restricted to estimating the number of non-fatal overdoses that, once being attended by an ambulance, undergo no further treatment. Therefore, of the 496 estimated overdoses 25 will be fatal, leaving 471 cases who may potentially incur further health care costs at emergency departments or as inpatients.

3.3.5 Emergency Department Attendance

Once stabilised, it is recommended that an overdose patient should be held, voluntarily, for four hours observation or until the doctors are satisfied they are safe to leave. While this element of overdose treatment is currently administered onsite at MSIC, achieving this same health outcome without MSIC would require attendance at a hospital emergency department (ED). As part of the treatment protocol the NSW Ambulance Service offers to transport overdose patients to an ED. The cost of ED attendance is summarised in Table 3.7 below.

Table 3.7: ED Attendance Cost Summary

Non-fatal OD	ED Attendance Rate	Cost Per ED Attendance	Total
471	95%	\$691	\$308,943

While observation may be recommended treatment, in reality not all overdose patients voluntarily stay for this period. Importantly, though, MSIC report higher rates of patient retention for observation than is common for

¹⁹ Matthew Warner-Smith, Michael Lynskey, Shane Darke, Wayne Hall, *Heroin overdose prevalence, correlates, consequences and interventions*, A report prepared by the National Drug and Alcohol Research Centre, UNSW for the Australian National Council on Drugs 2001

ambulance attendances. MSIC staff estimated that 95% of overdose patients stay for this observation period. Continuing with the same “with/without” approach, 95% of non-fatal overdoses in the comparison year will be attributed an ED attendance.

The cost of an overdose related ED attendance was estimated to be \$691. NSW Health provided information on average cost per admitted episode of illegal intravenous drug overdose across NSW and particular drug ‘hot spot’ hospitals, including St Vincent’s.²⁰ The average cost for NSW and the drug ‘hot spot’ hospitals varied very little. Given the small variance and the fact that St Vincent’s Hospital is situated within MSIC’s catchment area, it was decided to use the St Vincent’s average cost of \$664. Adjusting to 2008 dollars from the 2005/06 base year data leads to a cost of \$691 per drug overdose ED attendance. It should be noted that this is an average cost estimate. NSW Health advised that the hospital system had few excess resources to handle an increased workload and therefore any additional resources required would be approximate to average cost. Additionally, any resources saved due to MSIC’s operations could be employed elsewhere in the hospital system, providing an associated opportunity cost which is reasonably assumed to be at least equal to the average cost.

Based on the above numbers the estimated cost of providing ED treatment to non-fatal drug overdose patients for the comparison year is \$308,943 (471 non-fatal overdoses x 95% ED attendance x \$691 per ED attendance).

3.3.6 Inpatient Admissions

If an overdose incident is severe enough, it will require further Inpatient hospitalisation even after any other ambulance call out or ED attendance. Table 3.8 summarises the costs associated with inpatient treatment in the comparison year.

Table 3.8: Inpatient Admission Cost Summary

Non-fatal OD	ED Attendance	Inpatient Admission	Cost Per Admission	Total
471	95%	17.51%	\$3,372	\$264,125

NSW Health provided data on overdose inpatient admissions at a number of drug ‘hot spot’ hospitals. The average rate of inpatient admission per ED overdose attendance was 17.51%.

Applying this percentage to the previously estimated number of non-fatal overdoses indicates that for the comparison year, there would be a further 78 inpatient admissions (471 non-fatal overdoses x 95% ED attendance x 17.51%).

The cost of a drug overdose inpatient admission was provided by NSW Health. Using the same data sources as for ED attendance costs, a value of \$3,372 was arrived at. This final value was based on \$3,242 in 2005/06 dollars adjusted for CPI. This cost estimate was reinforced by more recent aggregated NSW wide data on inpatient and ED costs.²¹ As for the ED costs, discussed in 3.3.5 above, these cost estimates are based on average costing as the same rationale applies.

²⁰ INFORMH and NSW Health, selected data extracted from NSW Hospital Cost Database based on 2005/06 NSW Hospital Cost Data Collection,

²¹ NSW Costs of Care Standards 2006/07, MSW Health Inter-Government & Funding Strategies Branch

The cost of overdose inpatient admission was then estimated to be \$264,125 (78 inpatient admissions x \$3,372 per admission).

3.4 Alternative Health Costs for Client Services

Beyond providing injecting facilities to clients, MSIC also offers a raft of other client services. These include a range of clinical, general medical and psycho-social services. In the absence of MSIC, we have assumed that these services would generally be provided by general practitioners although in practice a number might be provided by hospital emergency departments and others not provided at all, leading *prima facie* to later increased adverse outcomes. The benefits to MSIC of these services would constitute avoided costs of being provided elsewhere.

It was estimated that, in the comparison year, 4,313 visits to health care professionals would have to be provided for to achieve a similar health outcome than currently occurs at MSIC. The cost of providing these visits was estimated at \$323,422. Table 3.9 below demonstrates the calculations and assumptions underlying this estimate.

Table 3.9: Alternative Client Services Health Costs Summary

Client Services	Services Per Visit	Cost Per Visit	Total
8,625	2	\$75	\$323,422

Using historical MSIC data on the ratio of client services to injections we estimated that, in the comparison year where 76,532 injections take place, 8,625 client services will be administered. MSIC data demonstrated that, for every injecting incident, there was an 11.27% chance that a client service would also be administered.²²

Interviews with MSIC staff suggested that a number of client services may be administered at any one visit, i.e. when a patient attends an MSIC doctor, they may receive more than one service. MSIC suggested that a simple assumption of two client services administered per visit would cover these instances. Applying this assumption to the 8,625 client services will result in 4,313 visits.

Estimating a cost for a client service was a difficult task. MSIC advised that, depending on the type of service administered and the length of the consultation, the cost could vary quite significantly from a standard Medicare consultation rate of approximately \$30 to over \$200 for certain Medicare Item Numbers.²³ Furthermore, interviews with MSIC and Kirketon Road staff suggested that, due to many doctors being unwilling to treat drug users, many would be forced to attend a hospital ED for these client services. With hospital EDs already under a heavy workload, and with higher overheads than a standard GP, any average cost of attending an ED is likely to be significantly higher than standard Medicare rates. Given the above arguments an average cost per client service of \$75 per visit was thought reasonable. As significant time and resources would be required by local hospitals to cover these services in the absence of MSIC, and there is a recognisable opportunity cost associated with these services, it was assumed that average costing was appropriate.

²² Sydney Medically Supervised Injecting Centre Evaluation Report No. 4: Evaluation of service operation and overdose-related events, NCHECR for the NSW Department of Health, June 2007, p.20

²³ Australian Government Department of Health and Ageing, *Medicare Benefits Schedule Book*, 1 November 2007

Applying this \$75 cost to the 4,313 visits results in alternative health costs of \$323,422.

3.5 Alternative Health Costs for Referral Services

Alternative referral services include referrals to a range of drug treatment, health care and psycho-social services. These referrals are particularly time-consuming as they frequently require a lengthy one-on-one consultation and many phone calls on the spot before satisfactorily ensuring that the patient has been successfully referred to the required service. We have been advised that general practitioners have been increasingly unwilling to be involved in the provision of these services to drug users and alternative sources of referral to MSIC in practice would be difficult to access. Nonetheless, consistent with our broad evaluation approach, we have assessed the cost of providing these services in the absence of MSIC.

It was estimated that, in the comparison year, 1,221 referral services would have to be delivered to achieve a similar health outcome than currently occurs at MSIC. The cost of providing these referrals was estimated at \$244,287. Table 3.10 below demonstrates the calculations and assumptions underlying this estimate.

Table 3.10: Alternative Referral Services Health Costs Summary

Referral Services	Services Per Visit	Cost Per Visit	Total
1,221	1	\$200	\$244,287

Historical MSIC data on the ratio of referral services to injecting incidents showed that for every injecting incident there was a 1.596% chance that a referral service would also be administered.²⁴ For the comparison year where 76,532 injections take place, this results in an estimated number of 1,221 referral services being provided.

Unlike client services where more than one service may be administered per visit, we were advised that, due to the nature of a referral service, it would not be suitable to assume that more than one service could be provided in a single visit. Although it would be possible for more than one referral service to be provided in a single visit to MSIC, this would take twice the time and resources.

MSIC and NSW Health advised that, given the time and resources involved in obtaining a referral, a cost of \$200 would be a reasonable estimate. For the same reasons as in 3.5 above, average costing was assumed to be reasonable for these alternative costs.

At \$200 per referral and 1,221 referrals, the alternative cost to the health system in the absence of MSIC is estimated to be \$244,287.

3.6 Other Sector Costs

The major thrust of this economic evaluation has been on alternative health costs. However, the terms of reference also refer to other agency costs. This particularly refers to police and criminal justice costs. Our review of available statistics and literature does not provide a clear picture on the level of law and order costs associated with drug-related crime. Furthermore, this specific evaluation is only concerned with differential costs attributable to MSIC, and here again there is little hard statistical evidence. The 2003 evaluation of

²⁴ Sydney Medically Supervised Injecting Centre Evaluation Report No. 4: Evaluation of service operation and overdose-related events, NCHECR for the NSW Department of Health, June 2007, p.21

MSIC acknowledged that the difficulty of identifying and measuring likely police service cost offsets and assumed a proportion of overdose events involved a police response.²⁵ The report estimated that 10% of overdoses are attended by police at a cost of 20% of an ambulance call out. This resulted in savings to police of around \$9,300, in 2003 dollars, by having overdoses treated at MSIC. Although this value was used in a previous analysis, more recent discussions with NSW Health and relevant authorities have suggested that, given attendance at incidents is core police business, there would be no change in costs for a small reduction in overall attendance rates. For the purposes of this analysis, we have assumed that no additional costs will be incurred for initial police attendance at an overdose. This assumption was then varied as part of the sensitivity testing in section 4.3.8.

One avenue not previously addressed was attempting to estimate the Police and Coronial costs of a fatal overdose. While basic attendance at an incident has already been assumed to be cost neutral with/without MSIC, it was thought that any necessary follow-on investigation in overdose deaths would have an otherwise avoidable direct cost or at the least represent a significant opportunity cost of Police and Coronial time. With data available on overdose numbers and fatality ratios, a recognisable cost could be attributed to Police and the Office of the State Coroner.

An overdose death requires significant Police and Coronial time. Initially Police must attend all cases of drug overdose death, set up crime scenes and investigate as per any other death.²⁶ This involves significant police time including Detectives, Crime Scene Investigators and the Forensic Services Group. Furthermore, the Forensic Pathologists, who ultimately conduct the autopsies, must attend. All cases of suspected drug-related deaths are referred to the NSW Coroner's Court, and the NSW Division of Analytical Laboratories (DAL) performs pathology tests for all cases in which postmortem examinations are conducted, which includes all suspected drug-related deaths.²⁷ Beyond the medical element of a Coroner's investigation, the Coroner must prepare a report establishing the cause of death and Forensic Counsellors liaise with family in regards to options for disposal of the bodies.²⁸

Using the estimates for fatal overdoses in the comparison year, as calculated in Section 3.2.4 above, this would result in 25 Police and Coronial investigations in the comparison year.

While it has not been possible to get accurate estimates on the Police and Coronial costs associated with a fatal overdose, various sources indicate that an assumed cost of \$10,000 per incident is a reasonable estimate. 2003 research on unnecessary autopsies in Queensland estimated that a full internal autopsy costs around \$2,000 (\$2,300 in 2008 dollars).²⁹ 2005 research on the cost of police investigations into fatal accidents estimated a cost per accident of \$7,394 (\$8,480 in 2008 dollars).³⁰ With further unquantified costs coming from toxicology, police assisting the Coroner, and Forensic Counsellors, \$10,000 is likely to be an underestimate of the actual cost to Government from investigating an overdose fatality.

At \$10,000 per fatal overdose, this results in a cost of \$250,000 for the comparison year (25 deaths x \$10,000).

²⁵ MSIC Evaluation Committee (2003), *Final report on the evaluation of the Sydney Medically Supervised Injecting Centre*, Kaldor J, Lapsley H, Mattick R, Weatherburn D, Wilson A

²⁶ Australian Injecting and Illicit Drug Users League, Fact Sheet: *Overdose & Police, What to Expect – State by State*

²⁷ Louisa J Degenhardt, Elizabeth Conroy, Stuart Gilmour and Wayne D Hall, *The effect of a reduction in heroin supply on fatal and non-fatal drug overdoses in New South Wales, Australia*, eMJA rapid online publication 15 November 2004

²⁸ Magistrate Carl Milovanovich, NSW Deputy State Coroner, *The Role of the Coroner and Coroners Court*, March 2006

²⁹ Carpenter, Belinda J. and Barnes, Michael A. and Naylor, Charles and Adkins, Glenda and White, Brendan M. (2006) Issues surrounding a reduction in the use of internal autopsy in the coronial system. *Journal of Law and Medicine* 14(2):pp. 199-208

³⁰ MRJ Baldock, AJ McLean, *The economic cost and impact of the road toll on South Australia*, March 2005

Finally, the fact that these Other Sector costs do not include any estimate of a likely reduction in drug-related crime due to the controlled operations at MSIC, should reinforce the view that these costs are likely an underestimate of the wider costs savings from MSIC.

4 Economic Evaluation

4.1 Introduction

Most economic evaluations refer to assessments of investment proposals and derive measures of economic worth in terms of the economic return on the investments over a nominated evaluation period. This particular evaluation is not concerned with capital investment. Rather, it is concerned with comparing the annual recurrent costs of MSIC with the costs which would be borne elsewhere in the health system to cater for MSIC's current clientele. On the basis that we have assumed similar health outcomes, the comparison may be viewed most simply on an annual basis, i.e. one year's MSIC operating costs compared with alternative health cost provision. This essentially represents a cost-effectiveness analysis, in this case to identify whether the costs of running MSIC are likely to be lower or higher than the provision of comparable health care services.

To the extent that medical opinion believes that the closure of MSIC would actually lead to a deterioration in health outcomes and that differential alternative treatments would be longer lasting than one year, then the evaluation could be considered conservative. However, without significantly enhanced scope of work, we have confined our evaluation to an annual comparison and provided a range of potential alternative costs.

4.2 Base Results

Table 4.1 presents a comparison of the estimated costs of running MSIC against the costs of providing a similar health outcome elsewhere in the health system for a representative comparison year.

Table 4.1: Base Evaluation Results for the Comparison Year

With/Without MSIC	Costs 2007/08 (\$000)
With MSIC Costs	2,770
Without MSIC Costs	
<i>HIV & HCV Infection</i>	1,740
<i>Client & Referral Services</i>	568
<i>Overdoses</i>	871
<i>Other Agencies</i>	250
Alternative Total	3,428
Cost Differential	- 658

The results in Table 4.1 indicate the following:

- On a with/without comparison of quantifiable costs to Government, MSIC saves \$658,000 over providing similar health outcomes, as currently achieved at MSIC, through other means in the health system
- Without MSIC in place, there would be significant costs to Government in the treatment of Overdoses and new HIV and HCV infections
- Alternative HIV and HCV Infections costs contribute most to the Without MSIC Costs, making up 50% of the alternative cost followed by Overdose costs at 25%

- This positive savings result from MSIC is likely to be an underestimate of its total net economic value given intangible costs are not measured in this evaluation; e.g. deterioration in health, reduced functionality, public amenity, drug related crime, and morbidity etc

4.3 Sensitivity Tests

A number of sensitivity tests were undertaken to assess the robustness of the results to changes in key variables. The sensitivity tests focused on changes to parameters that could be estimated with the least amount of certainty. The sensitivity tests are not intended as a judgment on the probability or likelihood of any assumption being higher or lower than the base assumptions. The base assumptions are themselves thought to be the most reasonable assessment of likely measures, all things considered.

These tests are summarised in Sections 4.3.1 to 4.3.8 over the following pages. A further “Lowest Estimate” versus “Highest Estimate” scenario is summarised in Section 4.3.9 representing a combination of all the individual low and high sensitivity tests. Finally, Section 4.3.10 examines the impact of including estimates of the value of human life as part of the evaluation methodology.

4.3.1 HIV and HCV Prevalence

Sensitivity tests for HIV and HCV prevalence were conducted at:

- HIV
 - 2% - MSIC self reported data
 - 5% - a peak year for Kirketon Road Centre NSP blood test data
- HCV
 - 70% - National average from NSP Survey
 - 87% - peak year for Kirketon Road Centre NSP blood test data

Table 4.2 below presents the results of the tests at these values.

Table 4.2: HIV & HCV Prevalence Rates Sensitivity Test

Costs With/Without MSIC (\$000)	HIV and HCV Prevalence Rates		
	Low – 2% & 70%	Base – 3.475% & 78%	High – 5% & 87%
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	1,518	1,740	1,983
<i>Client & Referral Services</i>	568	568	568
<i>Overdoses</i>	871	871	871
<i>Other Agencies</i>	250	250	250
Alternative Total	3,206	3,428	3,671
Cost Differential	- 436	- 658	- 901

4.3.2 Needle and Syringe Sharing Prevalence

Sensitivity tests for the prevalence of needle and syringe sharing were conducted at:

- 2.25% - lower range of estimates
- 5% - upper range based on fact MSIC caters to most marginalised users

Table 4.3 presents the results of the tests at these values.

Table 4.3: Needle and Syringe Sharing Prevalence Rates Test

Costs With/Without MSIC (\$000)	Needle and Syringe Sharing Prevalence Rates		
	Low – 2.25%	Base – 3.6%	High – 5%
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	1,138	1,740	2,363
<i>Client & Referral Services</i>	568	568	568
<i>Overdoses</i>	871	871	871
<i>Other Agencies</i>	250	250	250
Alternative Total	2,827	3,428	4,051
Cost Differential	- 57	- 658	- 1,281

Table 4.3 indicates that varying the prevalence of needle sharing has a marked impact on the bottom line results. As needle sharing directly affects the occurrence of new HIV and HCV infections, both of which come at considerable cost to Government, any change in sharing will have a proportionally large impact on the final outcome.

4.3.3 HIV and HCV Costs

Sensitivity tests for the lifetime healthcare cost of HIV and HCV infections were conducted at:

- HIV
 - \$173,348 – lowest estimate from a 2000 report
 - \$406,000 – highest estimate from the most up to date and relevant report commissioned for NSW
- HCV
 - \$6,243 – lowest estimate from a 2003 report for the Federal Department of Health and Ageing
 - \$14,308 – highest estimate from a 2008 report for NSW

Table 4.4, on the following page, presents the results of the tests at these values.

Table 4.4: Cost of HIV and HCV Infection Sensitivity Test

Costs With/Without MSIC (\$000)	Cost of HIV and HCV Infections		
	Low – \$173K and \$6K	Base – \$290K and \$10K	High – \$406K and \$14K
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	1,109	1,740	2,370
<i>Client & Referral Services</i>	568	568	568
<i>Overdoses</i>	871	871	871
<i>Other Agencies</i>	250	250	250
Alternative Total	2,797	3,428	4,059
Cost Differential	- 27	- 658	- 1,289

Table 4.4 indicates that changes to the cost of HIV and HCV infection have a major impact on the estimated value of retaining MSIC. However, even when taking the most conservative and outdated estimates of treatment costs, retaining MSIC is still marginally better value to Government on a with/without basis.

4.3.4 Overdose Rate Per Injection

Sensitivity tests for the rate of overdose per injection were conducted at:

- 0.54% – the historic observed rate at MSIC, and
- 0.756% – 40% increased chance of overdosing per injection without MSIC

These values represent tests at either side of the base assumption rate of 0.648%. The base assumption rate of 0.648% was generated by assuming there would be 20% more overdoses per injection without MSIC in place than the current rate. In other words, the services MSIC offer contribute to a 20% reduction in the number of overdoses that would occur without MSIC. The test at 0.54% therefore represents the scenario where users are no more likely to overdose per injection than if they used the MSIC facilities. Testing at 0.756% represents the scenario where users are at a 40% greater risk of overdose if they do not use MSIC. Table 4.5 presents the results of the tests at these values.

Table 4.5: Overdose Rate Per Injection Sensitivity Test

Costs With/Without MSIC (\$000)	Overdose Rate Per Injection		
	Lower Propensity – 0.54%	Base – 0.648%	Higher Propensity 0.756%
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	1,740	1,740	1,740
<i>Client & Referral Services</i>	568	568	568
<i>Overdoses</i>	725	871	1,016
<i>Other Agencies</i>	210	250	290
Alternative Total	3,243	3,428	3,613
Cost Differential	- 473	- 658	- 843

4.3.5 Cost of Client Service & Referral

Sensitivity tests for the costs of Client and Referral Services were conducted at:

- Client Service:
 - \$50
 - \$100
- Referral Service:
 - \$150
 - \$250

Table 4.6 presents the results of the tests at these values.

Table 4.6: Cost of Client Service & Referral Sensitivity Test

Costs With/Without MSIC (\$000)	Cost Per Client & Referral Service		
	Low – \$50 & \$150	Base – \$75 & \$200	High – \$100 & \$250
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	1,740	1,740	1,740
<i>Client & Referral Services</i>	399	568	737
<i>Overdoses</i>	871	871	871
<i>Other Agencies</i>	250	250	250
Alternative Total	3,259	3,428	3,597
Cost Differential	- 489	- 658	- 827

4.3.6 Police and Coroner’s Costs

Sensitivity tests for the cost of Police and Coronial investigations resulting from an overdose fatality were conducted at:

- \$5,000 – half the base estimate
- \$20,000 – double the base estimate

Table 4.7, on the following page, presents the results of the tests at these values.

Table 4.7: Cost of Police and Coronial Investigation Sensitivity Test

Costs With/Without MSIC (\$000)	Cost of Police and Coronial Investigation		
	Low – \$5,000	Base – \$10,000	High – \$20,000
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	1,740	1,740	1,740
<i>Client & Referral Services</i>	568	568	568
<i>Overdoses</i>	871	871	871
<i>Other Agencies</i>	125	250	500
Alternative Total	3,303	3,428	3,678
Cost Differential	- 533	- 658	- 908

4.3.7 Police Overdose Attendance Costs

A sensitivity test was conducted for the inclusion of Police related costs to cover the initial attendance at an overdose incident. As discussed in Section 3.6 above, as initial attendance at overdose incidents is core police business, it was assumed that there was no recognisable cost difference from a marginal increase in the number of overdose incidents requiring police attendance if MSIC were not in place. The 2003 evaluation of MSIC estimated that 10% of overdoses are attended by police at a cost of 20% of an ambulance call out. This resulted in savings to police of around \$9,300, in 2003 dollars, by having overdoses treated at MSIC. Using a similar methodology but using a more specific value of Police time used in previous SAHA assessments we estimate, \$6,000 in additional costs to Police if MSIC were not in place (496 overdoses x 10% police attendance x \$120). Note that this is a with/without sensitivity and thus there is only one variation on the base assumptions, in this case a high cost scenario

Table 4.8 below shows the results of the marginal change in Other Agencies costs. Although minor it has been included for completeness sake.

Table 4.8: Police Overdose Attendance Costs

Costs With/Without MSIC (\$000)	Police Overdose Attendance Costs		
	Low - N/A	Base – No Cost	High – Cost Included
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	1,740	1,740	1,740
<i>Client & Referral Services</i>	568	568	568
<i>Overdoses</i>	871	871	871
<i>Other Agencies</i>	250	250	256
Alternative Total	3,428	3,428	3,434
Cost Differential	- 658	- 658	- 664

4.3.8 Ambulance Call Out Cost – Marginal vs Average

A sensitivity test was conducted to examine the impact of changing between average and marginal cost estimates for Ambulance Call Outs. The Base Assumptions provided for an Average Cost of \$600 per call out. As discussed in Section 3.3.3, the Marginal Cost of a Call Out was assumed to be \$100, covering Narcan administration and marginal vehicle costs.

Table 4.9 below presents the evaluation results when Ambulance Call Out Cost is varied between marginal and average cost, and indicates that total alternative costs fall by only \$248,000, leaving these costs still higher than MSIC costs.

Table 4.9: Ambulance Call Out Cost – Marginal vs Average

Costs With/Without MSIC (\$000)	Police Overdose Attendance Costs		
	Low - Marginal	Base – Average	High – N/A
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	1,740	1,740	1,740
<i>Client & Referral Services</i>	568	568	568
<i>Overdoses</i>	623	871	871
<i>Other Agencies</i>	250	250	250
Alternative Total	3,180	3,428	3,428
Cost Differential	- 410	- 658	- 658

4.3.9 Highest vs Lowest Estimate Scenarios

A combined test of all the individual Low and High sensitivities above was conducted to demonstrate the variability of the results to combined changes in key parameters.

Table 4.10 presents these “Highest Estimate ” and “Lowest Estimate” scenario results.

Table 4.10: Highest vs Lowest Estimate Scenarios

Costs With/Without MSIC (\$000)	Highest vs Lowest Estimate Scenario		
	Lowest Estimate Scenario	Base Assumptions	Highest Estimate Scenario
With MSIC Costs	2,770	2,770	2,770
Without MSIC Costs			
<i>HIV & HCV Infection</i>	660	1,740	3,710
<i>Client & Referral Services</i>	398	568	737
<i>Overdoses</i>	519	871	1,016
<i>Other Agencies</i>	111	250	586
Alternative Total	1,683	3,428	6,048
Cost Differential	1,087	- 658	- 3,278

Table 4.10 indicates that the most significant component is the values attached to HIV and particularly HCV infections. While the most conservative assumptions for each variable taken separately indicate that MSIC represents the least cost outcome, Table 4.10 indicates that, where the most conservative assumptions are selected for all the specified variables, then the optimal health outcomes currently provided by MSIC could only be achieved if Government incurred at least an extra \$1.1 million in annual health budget funding. Alternatively, should the already conservative base assumptions be relaxed slightly, to still justifiable numbers, for all the variables taken together, then the health outcomes provided by MSIC could only be matched elsewhere in the health system at an additional cost to Government of \$3.3 million.

4.3.10 Value of Human Life

A stand alone sensitivity was conducted to examine the impact of considering the value of human lives saved which could be attributable to MSIC. Although a contentious issue and specifically outside the original project remit, a brief investigation can help highlight the potentially massive benefits from a facility such as MSIC.

Two separate methods were selected for incorporating value of human life into the evaluation:

- Breakeven analysis, and
- Estimates based on decreases in overdose morbidity due to MSIC's operations.

Central to these two methods is the actual value placed on a human life. This sub-issue is contentious in itself with values varying between \$1.6 million³¹ and \$3.5 million³² and even as high as \$6.7 million³³. For the purposes of this analysis we have assumed a mid point value of \$3.5 million per life.

Breakeven analysis seeks to find the point at which a project has a neutral cost outcome, i.e. neither returns a positive or negative outcome. In this instance we are interested in finding out how many lives MSIC would have to save per year to cover the \$2.77 million annual cost of operating the facility. Based on a value of \$3.5 million per life, MSIC's operations would have to prevent only 0.8 deaths per year to achieve a breakeven on the cost of operations. In other words, if it is believed that MSIC prevents at least 0.8 deaths per year then in economic terms it is a positive outcome.

As discussed in Section 3.3.4, MSIC was estimated to prevent approximately 25 overdose related deaths in the comparison year. Applying a value of human life to this number results in benefits of \$87.5 million in the comparison year. This covers the \$2.77 million operating costs of MSIC almost 32 times over.

The above analysis demonstrates that even conservative estimates of the number of deaths MSIC may prevent each year results in massive positive outcomes in economic terms for the current funding of the Centre. It should be noted that this is before any other cost savings, as detailed in the base methodology of this report, are taken into account.

³¹ *Austrroads Update of RUC Unit Values of June 2007*. The costs were indexed to December 2007 using Average Weekly Earnings, ABS Catalogue 6302.0

³² RailCorp estimate based on research in other hazardous industry sectors

³³ US figure based on Environmental Protection Agency estimates as discussed in Elana Schor's article the guardian.co.uk, July 11, 2008