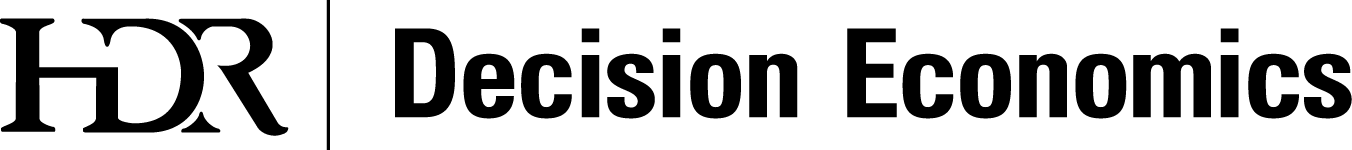
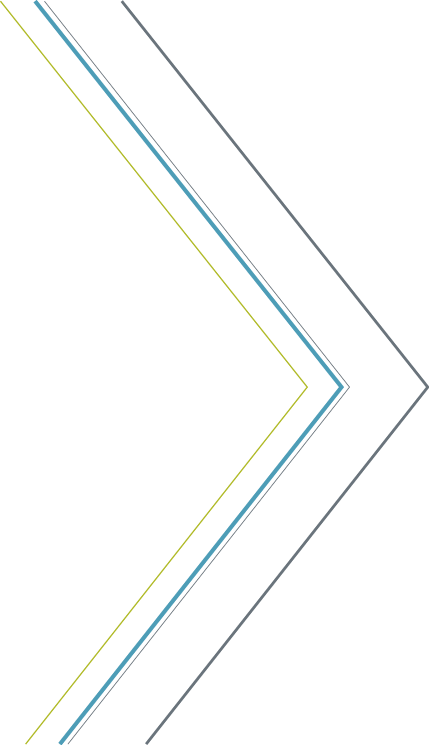
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December 13, 2013

Update of the Business Case Analysis of Secure Treatment Unit for Mentally Ill Female Offenders

Final Report

Royal Ottawa Health Care Group

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ACKNOWLEDGEMENTS

Funding for this report has been provided by the Royal Ottawa Health Care Group, the 1000 Islands Community Development Corporation, and the Federal Economic Development Agency For Southern Ontario.

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# Executive Summary

This report provides an update of a 2011 cost-benefit analysis of the proposed secure treatment unit (STU, or FSTU) for mentally ill female offenders (MIFOs) to be developed in Brockville, Ontario.

Although the proposed FSTU has not been constructed to date, it generates interest and is gaining support with a wide range of stakeholders. Since the last study the Royal Ottawa Health Care Group has expanded its proposal to include Telemedicine services which will:

* Help manage individuals who may be deteriorating prior to referral to the Royal which could obviate the need for more intensive services.
* Allow a doctor to patient relationship to develop prior to referral to the Royal which increases the likelihood of the patient accepting a voluntary transfer to the Royal.
* Allow for the smooth transition of patients, once treatment is completed at the Royal, back into their home community or correctional institution.
* Allow for follow-up care once returned to the correctional institution thereby reducing the need for additional services and lowering recidivism.
* Provide Mobile Crisis Teams to travel to CSC facilities and work with local medical and Mental Health Staff to manage offenders who are decompensating.

Some input assumptions in a cost-benefit assessment may become outdated over time due to, for example, more recent statistical data publications and source literature updates, or new research on the issue with new insights and findings. The Royal Ottawa Health Care Group re-engaged thus HDR to review the model with all its inputs and provide an updated cost-benefit analysis of the proposed FSTU.

APPROACH

The study team reveiwed all model inputs and updated/refined them as possible and warranted depending on the availability of new and more updated information. However, the overal methodology and model structure remained unchanged.

The benefits captured in this cost-benefit analysis include the following benefit categories:

* Psychological, safety, and health benefits to staff and inmates due to diversion of mentally ill offenders (avoided injuries to self, other inmates and staff, and avoided suicides);
* Future psychiatric and health care costs avoided (emergency departments, general and psychiatric hospitalization, and forensic psychiatric hospitalization) ;
* Reduced incarceration costs, justice administration, and victimization costs due to reduced recidivism;
* Administrative, legal and policing cost savings due to reduced re-contacted recidivism;
* Reduced child foster care costs due to reduced mother recidivism; and,
* Benefits due to increased employability after the treatment.

The costs include capital construction costs and operation and maintenance costs (clinical operation and maintenance cost, doctors professional fees, and non-clinical operation costs).

All costs and benefits were evaluated over the period from 2014 to 2036 assuming 2 years of facility construction and 20 years of operations.

RESULTS

Summary Table 1 shows the summary results of the updated cost-benefit analysis. The results are presented for two discount rates, a more conservative rate of 8% and an alternative rate of 3%.

The table demonstrates that the expected NPV of the proposed facility is larger than zero and substantial in magnitude. The net present value of the proposed FSTU amounts to $163.02 million when evaluated at the discount rate of 8% and $304.42 when evaluated at the discount rate of 3%. The proposed FSTU represents thus economically worthwhile project.

The value of benefits amounts to $316.51 when evaluated at the 8% discount rate and $546.26 when evaluated at the discount rate of 3%. The value of costs amounts to $153.49 million and $241.84 million at the 8% discount rate and 3% discount rate, respectively.

Comparing the costs and benefits it can thus be seen that the cost-benefit ratio exceeds 2.0 for both discount rates (amounting to 2.06 for 8% discount rate and 2.26 for 3% discount rate). This means that for each $1 invested in the FSTU in construction and operating costs, the facility generates over $2 worth of benefits to the society.

The internal rate of return amounts to 43.8%, well above the assumed discount rates and well above the opportunity costs of capital (usually assumed at between 5% and 10%). This means that the project would break even generating NPV of $0 under a discount rate as high as 43.8%. Thus, the proposed FSTU can be considered a very worthwhile project from the economic point of view.

Summary Table 1: Summary Results of Costs of Analysis of the Proposed Facility (2014-2036, 2013 Dollars)

|  |  |  |
| --- | --- | --- |
| **Financial Indicators** | **8% Discount Rate** | **3% Discount Rate** |
| Total Costs, $M | $153.49 | $241.84 |
| Total Benefits, $M | $316.51 | $546.26 |
| **NPV, $M** | **$163.02** | **$304.42** |
| ROI (over project life time), Percent | 106% | 126% |
| Benefit-Cost Ratio, Ratio | 2.06 | 2.26 |
| Internal Rate of Return (IRR), Percent | 43.8% | |

The vast majority of benefits included in thei cost-benfit analysis represent direct cost savings to various stakeholders, in particular provincial and federal correctional services, justice adminstration, and health care. Thus, these benefits represent direct savings to all taxpayers. Over the study period, the amount of these savings is well in excess of total costs of the proposed FSTU.

This implies that in the longer run, housing MIFOs in FSTU rather than regular prisons and jails is a more cost-effective approach to rehabilitation of this offender group.

# Introduction

In 2011, HDR Corporation (HDR) conducted for the Royal Ottawa Health Care Group (The Royal) an economic analysis of the proposed secure treatment unit (STU, or FSTU) for mentally ill female offenders (MIFO) to be developed in Brockville, Ontario.[[1]](#footnote-2)

The purpose of that study was to provide an economic analysis of the proposed FSTU for treating mentally ill female offenders as an alternative to incarceration in the mainstream prison system. This included three major components:

1. Cost-benefit analysis, or business case assessment of the proposed facility to estimate the net benefit to all stakeholders from building and operating an FSTU over the study period;
2. Economic impact analysis of the proposed facility (construction and operations) to estimate the magnitude of economic activity generated through the facility as measured in terms of business revenues, jobs, employment income, gross domestic product (GDP), and government tax revenues; and,
3. Recommendations regarding the desired differences between this female secure treatment unit and the existing male unit based on the differences in the profiles of mental disorders, paths and trajectories of offending, as well as social and macroeconomic pressures.

Although the proposed FSTU has not been constructed/opened to date, it still generates interest and is gaining support within a wide range of stakeholders.

Some input assumptions in a cost-benefit assessment may become outdated over time due to, for example, more recent statistical data publications and source literature updates, or new research on the issue with new insights and findings. The Royal re-engaged thus HDR to provide an updated cost-benefit analysis of the proposed FSTU. The scope of this update involves a review of all cost-benefit model inputs and a brief desktop research of data sources to identify possible, desirable, or feasible updates, with additional documentation for key inputs. However, the general structure of the cost-benefit model remains unchanged.

This report is organized as follows. Section 2 provides a brief overview of benefits and costs of the proposed facility which were included and modeled in the cost-benefit model. Section 3 presents a brief outline of the scope of the update and how it was done. Section 4 reports the results of the cost-benefit model simulations. Appendix 1 provides a list of input assumptions and data sources. Appendix 2 describes the development of key input updates. Appendix 3 lists the references that were used during this study.

# Overview of Benefits and Costs of the Proposed Secure Treatment Unit

Cost-benefit analysis involves an evaluation of the stream of benefits and costs of the proposed investment project. All benefits and costs are assessed on an *incremental* basis, i.e. compared to a baseline/base case scenario that would prevail in the absence of the proposed project. This section identifies the benefits and costs of the proposed FSTU as compared to a base case situation.

## Base Case Scenario and Benefits of the Proposed FSTU

The base case scenario for MIFOs in this cost-benefit analysis is the current approach or status quo situation which entails incarceration in the regular prison system, primarily federal and provincial jails. In this system, MIFOs receive crisis management assistance but not intensive therapy or help intended to treat their mental illness.

MIFOs who served their sentence and are released from prison are poorly prepared for integration into the general mainstream society. Their mental health issues may remain undiagnosed and untreated and therefore they receive little or no care for these in the community. They lack the education as well as some basic life skills so their employability is very low and reliance on the welfare system high. This, as well as the continued mental health problems, results in relatively high recidivism and repeat incarceration generating another cycle of costs throughout the judicial and corrections system.

In addition, many MIFOs are generally in poor health. After release from prison, they are reported to have a high usage of emergency department visits and a high rate of hospitalizations.

Under the FSTU scenario, the inmates diagnosed as having a mental illness and qualified for treatment at FSTU are diverted from the regular prison system to the proposed Facility. For modeling purposes it is assumed that the length of stay at FSTU is equal to their sentence that they would have to serve otherwise in a federal or provincial institution in the absence of FSTU. After their sentence and treatment in FSTU is completed, they are released to the community. In actual practice it is understood that MIFO’s federal sentences may last beyond the end of treatment and the FSTU model does not include post treatment reintegration back into the general prison population as well as MH&A follow-up via telemedicine and other modalities.

While in FSTU, MIFOs receive proper medical treatment related to their mental health as well as medical attention intended to improve their mental and general health status. In addition, they participate in programming designed more specifically to remediate their low educational attainment, job-related skills, and more general life management skills. All this is intended to help lower the rates of recidivism as well as the reliance on the public welfare system.

In addition, diversion of MIFOs to FSTU provides a relief to the mainstream correctional system which is not always best equipped to deal with mental illness cases (as it was not intended to do so). This generates some savings in incarceration costs as well as costs related to the disruptive behaviour of this group of inmates such as assaults on staff and other inmates and self-harm.

The benefits that were quantified in this assessment are summarized in .

Table 1: Categories of Benefits Included in Cost-Benefit Modeling

|  |  |  |  |
| --- | --- | --- | --- |
| **Item No.** | **Benefit Name** | **Description** | **Methodological Modeling Approach** |
| ***Psychological, Safety, and Health Benefits to Staff and Inmates*** | | | |
| 1 | Avoidance of cost of injury treatment (inmates and staff) due to incidents caused by MIFOs | MIFOs housed in the regular prisons are known to cause various incidents that intrinsically stem from their condition such as self-harming, or disruptive and anti-social behaviour. Interactions with the rest of the inmate population and the corrections staff may amplify the magnitude of the incidents leading to injuries to self, other inmates and corrections staff. Diverting MIFOs away from the regular prison system would help avoid such incidents and their related costs or at least reduce their number. | Incidence rates (number of incidents with injuries per inmate per year) can be extracted from the correctional data or the literature and multiplied by the number of MIFOs that would be diverted to FSTU to obtain an estimate of incidents/injuries avoided. This can then be multiplied by the average treatment cost (extracted from literature or health care cost data) to obtain total cost avoided. |
| 2 | Cost savings from reduction in sick leave by staff | Correctional officers are reported to have a relatively high utilization of sick leave, presumably because of the stressful work environment and injuries suffered in incidents with inmates. Diversion of MIFOs to FSTU should eliminate at least some sources of stress and injury and thus reduce the number of sick days. This would then reduce prison operating costs. | There is no data or direct evidence on the reduction in sick leave taken by corrections officers when MIFOs are diverted. Therefore, the approach is based on the notion that prisons in Ontario are in general at capacity. New inmates would thus require additional staff which would then take sick leave. Diversion of MIFOs to FSTU would eliminate the need for additional staff and thus the associated sick leave cost. The data on staffing ratios and sick leave costs (in the form of staff replacement costs) can be based on literature and data on operational costs and performance of the corrections system. |
| 3 | Cost savings due to prevented suicides (Value of life & inquest costs) | In extreme cases, MIFOs are known to take their own lives. A loss of life is a societal cost itself, and a suicide within a prison system will certainly require an inquest which is costly. Proper treatment can reduce or possibly eliminate such cases and thus help avoid the corresponding costs. | Literature can be used to extract data on suicide rates as well as assumptions for value of life and costs of an inquest. |
| ***Future Psychiatric and Health Care Costs Avoided*** | | | |
| 4 | General Hospital Treatment Costs | MIFOs are in general in poor health and are known to have a high rate of hospitalizations due to general health issues as well as mental health problems. Treatment in FSTU can be expected to reduce the hospitalization rates and health care costs. | Literature can be used to extract the data on hospitalization rates per year and reduction following treatment. Multiplying this by the number of cases treated at FSTU will give the number of cases avoided. This can be further multiplied by the average cost of a hospital stay from relevant literature or health care cost data to give an estimate of total cost avoided. |
| 5 | E.R./Acute Assessment Costs | MIFOs are in general in poor health and are known to have a high rate of emergency department visits due to general health issues as well as mental health problems. Treatment in FSTU can be expected to reduce these visits and health care costs. | Literature can be used to extract the data on the rates of ER visits per year and reduction following treatment. Multiplying this by the number of cases treated at FSTU will give the number of visits avoided. This can be further multiplied by the average cost of ER visit from relevant literature or health care cost data to give an estimate of total cost avoided. |
| 6 | Psychiatric Treatment Costs | Some MIFOs may receive specialized psychiatric treatment sometime in the future. Addressing their mental health issues today will help eliminate the need for treatment and the associated cost in the future. | Similar as for ER and general hospital costs. |
| 7 | Forensic Psychiatric Beds Costs | Legal practice indicates that some MIFOs will end up in forensic psychiatric care situations if their condition is not treated. Forensic psychiatric care is extremely expensive. Treatment in FSTU today will help avoid these costs in the future. | Literature can be used to extract data on incidences (rates per inmate), length of stay and cost per day. This can then be multiplied by the number of cases treated at FSTU to obtain total cost avoided. |
| ***Prison, Justice Administration, and Victimization Costs*** | | | |
| 8 | Court/Prosecution/Legal Aid Costs Avoided | Reduction in recidivism and repeat incarceration following treatment at FSTU will help avoid costs related to prosecuting a case in court including court costs, legal aid and other related costs. | Reduction in recidivism can be modeled based on results reported in the literature to estimate the number of incarceration cases avoided each year due to treatment in FSTU. This can then be multiplied by the respective costs per case reported in costs of crime studies. |
| 9 | Prison Costs Avoided from Diversion | MIFOs diverted to FSTU will save costs in the regular prison system. This saving will apply to both the cases diverted as well as to cases avoided due to reduced recidivism. | This can be estimated based on statistical data on incarceration costs (dollars per inmate per year) multiplied by the number of cases treated annually and cases avoided. Incarceration costs should include both ongoing operation and maintenance costs as well as capital costs (i.e. capitalized maintenance, capital renewal and replacement costs) in order to give a fair comparison of the base case with a facility that has yet to be built. |
| 10 | Costs of Property Stolen - Avoided | Reduction in recidivism will help avoid certain social costs of crime. Crime statistics indicate that theft is the most common offence category for this population group. Reduction in recidivism will help avoid these costs. | The number of recidivised cases avoided and the percentage of offences which involve theft will give the number of theft cases avoided. This can then be multiplied by the average value of property stolen based on cost of crime data. |
| ***Administrative, Legal and Policing Cost Savings due to Reduced Re-contacted Recidivism*** | | | |
| 11 | Police costs avoided | MIFOs released from prison have a high rate of police arrests which don't lead to official charges and trial but which still cause a significant cost burden. Treatment at FSTU can be expected to reduce the number of such cases. | Literature can be used to extract data on the incidence of cases and reduction due to psychiatric treatment. This can then be multiplied by the average policing costs based on costs of crime data. |
| ***Child Benefits due to Reduced MIFO Mother Recidivism*** | | | |
| 12 | Child foster care avoided | Many MIFOs are mothers and in some cases their incarceration may require foster care of their children. There is a cost of foster care due to the foster care benefits payments as well as court proceedings that often have to take place. Reduction in recidivism will help avoid these costs. | Number of incarceration cases avoided each year can be multiplied by the average cost of foster care. |
| ***Benefits Due to Increased Employability*** | | | |
| 13 | Employment Income Benefits to MIFO's | Increased employability of MIFOs following treatment at FSTU will give them employment with all their corresponding benefits such as more life satisfaction, a sense of independence, as well as a higher quality of life. | Literature can be used to develop assumptions for the increase in employment rate after STU treatment. This can then be multiplied by the number of cases to be treated and the average salary as reported in related studies. |
| 14 | Costs of Welfare Avoided | Increased employability of MIFOs will also reduce the number of them who are on welfare and thus reduce the welfare payments costs. | Literature can be used to develop assumptions for the reduction in reliance on welfare rate after STU treatment. This can then be multiplied by the number of cases to be treated and the average welfare payment. |

## Costs of the Proposed FSTU

below gives an overview of the costs of FSTU that were quantified and included in the cost benefit model. As shown in the table most costs categories were estimated by ROCHG and provided to HDR for the purpose of this analysis. The cost figures provided and estimated for 2011 were inflated to 2013 dollars.

Table 2: Costs of the Proposed FSTU

|  |  |  |  |
| --- | --- | --- | --- |
| **Item No.** | **Cost Name** | **Description** | **Methodological Modeling Approach** |
| 1 | Capital Costs | Currently, there are no available unoccupied facilities which would be suitable for the immediate use of the proposed FSTU. The key capitals cost is thus construction of a new building. | Costs estimates for both capital options were provided by The Royal. |
| 2 | Clinical O&M Costs | Clinical operating costs include nursing and administrative staff, costs of drugs, pharmacy, laboratory, and medical supplies. | Provided by The Royal. |
| 3 | Physician costs | Cost of FSTU physicians who would be charging provincial health care plans (e.g. OHIP in the case of inmates residing in Ontario) directly for their services. | Estimated by HDR using the average payments per physician as reported in CIHI publication *Average Payment per Physician Report*. For the costing purposes, 4 psychiatrists and 1 family physician were assumed for FSTU (half of the staffing at the male STU) and the province of Ontario was taken for the specific amounts of payments. |
| 4 | Non-Clinical O&M | Non-clinical operation and maintenance costs include housekeeping, laundry, food services plant maintenance and utilities. | Provided by The Royal. |
| 5 | Follow-up and Continuum of Care Cost | Discharged MIFOs would be provided with case management and counseling services to help them integrate in the society. | Provided by The Royal. |
| 6 | Corrections Costs | The proposed facility would still in its essence be a correctional facility and still require certain corrections and security costs. | Provided by The Royal. |

# Update Scope and Approach

The scope of this update involved a review of all cost-benefit model inputs and a brief desktop research of data sources to identify possible and desirable updates. Some input assumptions in a cost-benefit assessment may become outdated over time due to, for example, more recent statistical data publications and source literature updates, or new research on the issue with new insights and findings.

For example, the study team obtained detailed data from Correctional Services Canada on incidences of self-harm, assaults, and injuries in federal correctional facilities by facility type (including women’s facilities) which allowed to develop more accurate baseline rates of self-harm and assaults for MIFOs.

However, for most of the inputs of this cost-benefit model, no new data was identified; and many of the source documents used in the 2011 study were not updated or no new versions were identified in the public domain. Also, no new data and information regarding recidivism, re-arrests, or use of services by MIFOs was identified. Therefore, the corresponding inputs were left mostly unchanged, and monetary input values were only inflated to 2013 dollars. In particular, assumptions regarding the rates of recidivism were left unchanged. Some inputs were slightly adjusted after the data and sources collected in the previous engagement were re-assessed so as to use better matching data items. This resulted in some changes to the input values and sources.

Appendix 1 provides the list of all inputs, their quantitative assumptions and data sources. Appendix 2 provides a detailed discussion of various key input updates, including the data sources and rationale. All monetary values were inflated to 2013 dollars if they were not already expressed in these terms.

All benefits and costs were evaluated over the period from 2013 to 2036 with 2013 as the base year of the analysis to which all costs and benefits are discounted. Construction was assumed to begin in 2014, and 2016 was assumed to be the first year when residents are accepted to FSTU. The model captures thus the construction period and 20 years of facility operations. All quantifiable costs and benefits were estimated on an annual basis over that period compared to a situation without the proposed FSTU when the MIFOs would be housed in the mainstream correctional system.

Discount rates of 8% and 3% were used to calculate the present value of costs, benefits, and net benefits. The discount rate of 8% is more stringent compared to lower rates as it reduces more strongly the value of future benefits (although it also reduces the value of costs, including operating costs) and by some economists is considered relatively high (see Appendix 2 for a more detailed discussion on discount rates). Therefore, an alternative lower rate of 3% is also used as a test scenario. This leads to an alternative set of results for comparison.

All other aspects of the methodology, including the structure of the cost-benefit model, remain unchanged. As in the 2011 assessment, the cost-benefit analysis is conducted within a risk analysis framework that recognizes and implicitly models the uncertainty (or the range of plausible values) of certain inputs. Consequently, the results of the analysis are reported for the conventional mean or expected value as well as with the corresponding probability distribution. This is reported as the upper and lower values of the range of possible realizations of project benefits and net benefits which together help define the risk of project underperformance, or the net present value of the project falling below zero. The specific input assumptions and ranges of uncertainty assumed for each input are provides in Appendix 1.

# Results

As mentioned earlier, the cost-benefit model was simulated over the period 2013 to 2036 with 2013 as the base year of the analysis to which all costs and benefits are discounted. Construction was assumed to begin in 2014, and 2016 was assumed to be the first year when residents are accepted to FSTU. The model captures thus the construction period and 20 years of facility operations. All quantifiable costs and benefits were estimated on an annual basis over that period. Discount rates of 8% and 3% were used to calculate the present value of costs, benefits, and net benefits.

shows the summary results of the updated cost-benefit analysis. Overall, the table demonstrates that the expected NPV of the proposed facility is larger than zero and substantial in magnitude.

More specifically, the mean net present value of the proposed FSTU amounts to $163.02 million when evaluated at the discount rate of 8% and $304.42 when evaluated at the discount rate of 3%. The mean value of benefits amounts to $316.51 when evaluated at the 8% discount rate and $546.26 when evaluated at the discount rate of 3%. The value of costs amounts to $153.49 million and $241.84 million at the 8% and 3% discount rate, respectively.

The cost-benefit ratio exceeds 2.0 for both discount rates (amounting to 2.06 for 8% discount rate and 2.26 for 3% discount rate). This means that for each $1 invested in the FSTU in construction and operating costs, the facility generates over $2 worth of benefits to the society.

The internal rate of return amounts to 43.8%, well above the assumed discount rates and well above the opportunity costs of capital (usually assumed at between 5% and 10%). This means that the project would break even and generate NPV of $0 under a discount rate as high as 43.8%. Thus, the proposed FSTU can be considered a very worthwhile project from the economic point of view.

Table 3: Summary Results of Costs of Analysis of the Proposed Facility (2013-2036, Mean Values)

|  |  |  |  |
| --- | --- | --- | --- |
| **Financial Indicators** | **8% Discount Rate** | **3% Discount Rate** | **Undiscounted** |
| Total Costs, $M | $153.49 | $241.84 | $337.19 |
| Total Benefits, $M | $316.51 | $546.26 | $797.77 |
| **NPV, $M** | **$163.02** | **$304.42** | **$460.58** |
| ROI (over project life time), Percent | 106% | 126% | 137% |
| Benefit-Cost Ratio, Ratio | 2.06 | 2.26 | 2.37 |
| Internal Rate of Return (IRR), Percent | 43.8% | | |

shows the detailed results of the cost-benefit analysis by category of benefits and costs at the discount rate of 8%. The last two columns in the table (on the right hand side) show the results of risk analysis in the form of metric values from extreme ranges of the probability distribution at a specified cumulative probability distribution of 10% and 90%. Specifically, the table shows that there is a 10% chance that total benefits will not exceed $253.88 million and a 90% chance that they will not exceed $381.95 million. These figures define the range of reasonably possible realizations of benefits, or the 80% confidence interval. When combined with the value of costs to obtain the net present value (see the bottom section of the table), the results show then that there is a 10% chance that net benefits will not exceed $100.39 million and that the benefit cost ratio will not exceed 1.65. Also, there is a 90% chance that net benefits will not exceed $228.46 million and benefit-cost ratio will not exceed 2.49. These results demonstrate that there is virtually no risk of underperformance of the proposed facility, and that it generates a sizeable NPV and a very good benefit-cost ratio under a wide range of input realizations.

Table 4: Detailed Breakdown of Benefits and Costs, 8% Discount Rate

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Benefits and Costs Category** | **Mean (Expected Value)** | **Probability of Not Exceeding Value Shown** | | **Share of Total Benefits or Costs (at Mean)** |
| **10% Probability** | **90% Probability** |
| *BENEFITS* | | | |  |
| Psychological, Safety, and Health Benefits to Staff and Inmates |  |  |  |  |
| Cost of Injury Treatment Prevented | $0.05 | $0.01 | $0.12 | 0.0% |
| Cost Savings from Reduction in Sick Leave by Staff | $1.69 | $1.69 | $1.69 | 0.5% |
| Cost Savings Due to Prevented Suicides (Life & Inquest) | $9.17 | $2.50 | $17.35 | 2.9% |
| Total Psychological, Safety, and Health Benefits | $10.91 | $4.22 | $19.11 | 3.4% |
| Future Psychiatric and Health Care Costs Avoided |  |  |  |  |
| General Hospital Treatment Costs | $14.16 | $5.17 | $24.80 | 4.5% |
| E.R./Acute Assessment Costs | $0.27 | $0.19 | $0.35 | 0.1% |
| Psychiatric Treatment Costs | $15.96 | $5.16 | $29.68 | 5.0% |
| Forensic Psychiatric Beds Costs | $54.80 | $17.70 | $96.42 | 17.3% |
| Total Future Health Care Costs Avoided | $85.19 | $44.85 | $130.50 | 26.9% |
| Prison, Justice Administration, and Victimization Costs |  |  |  |  |
| Total Cost of Justice Administration | $2.57 | $2.50 | $2.64 | 0.8% |
| Prison Costs Saved from STU Diversion | $210.52 | $162.73 | $257.86 | 66.5% |
| Total Reduction in Victim Costs from Diversion | $0.15 | $0.06 | $0.26 | 0.0% |
| Total Prison and Justice Costs Avoided | $213.23 | $165.44 | $260.55 | 67.4% |
| Reduced Re-contacted Recidivism |  |  |  |  |
| Annual Police and Administrative Costs | $1.25 | $1.25 | $1.25 | 0.4% |
| Total Re-contacted Recidivism Costs Avoided | $1.25 | $1.25 | $1.25 | 0.4% |
| Child Benefits due to Reduced MIFO Mother Recidivism |  |  |  |  |
| Foster Care Costs Avoided | $0.44 | $0.27 | $0.66 | 0.1% |
| Total Foster Care Costs Avoided | $0.44 | $0.27 | $0.66 | 0.1% |
| Benefits Due to Increased Employability |  |  |  |  |
| Benefits from Employment of MIFOs | $3.44 | $1.45 | $5.80 | 1.1% |
| Welfare Payment Reductions | $2.06 | $1.04 | $2.97 | 0.6% |
| Total Increased Employability Benefits | $5.49 | $3.29 | $8.00 | 1.7% |
| **Total Benefits** | **$316.53** | **$253.88** | **$381.95** | **100.0%** |
| *COSTS* |  |  |  |  |
| Capital | $29.73 |  |  | 19.4% |
| Clinical O&M Costs | $65.60 |  |  | 42.7% |
| Physician costs | $9.84 |  |  | 6.4% |
| Non-Clinical O&M | $14.99 |  |  | 9.8% |
| Follow-up and Continuum of Care Cost | $5.12 |  |  | 3.3% |
| Corrections Costs | $28.21 |  |  | 18.4% |
| **Total Costs** | **$153.49** |  |  | **100.0%** |
| *NET BENEFITS* |  |  |  |  |
| Net Benefits (NPV), $M | $163.04 | $100.39 | $228.46 |  |
| Internal Rate of Return | 43.45% | 32.47% | 54.38% |  |
| Benefit-Cost Ratio | 2.06 | 1.65 | 2.49 |  |

Table 4 shows that the majority of benefits from the proposed FSTU are accounted for by Prison and Justice Costs Avoided. At the mean, these cost savings amount to 213.23 million over the analysis period (in discounted dollar terms), or about 67% of total benefits. Almost all of these costs are savings in the regular prison system due to diversion of MIFOs to FSTU and then reduced recidivism of this group. These savings exceed by far the total amount of costs of the proposed facility ($153.49 million over the study period, in discounted dollar terms). This implies that housing MIFOs in FSTU rather than regular prisons and jails is more cost-effective just based on relative incarceration costs.

The second largest category of benefits is represented by future health care costs avoided. At the mean these savings amount to $85.19 million over the study period (in discounted dollar terms), or nearly 27% of total benefits. These costs avoided represent direct savings to the health care system and thus savings to all tax payers.

shows the same information as but for benefits and costs evaluated at the alternative discount rate of 3%. The table demonstrates even higher value of benefits, net benefits, and benefit-cost ratio than those under the 8% discount rate. However, it should be emphasized that even under a more conservative discount rate of 8% the proposed facility displays a very good cost-benefit performance outcomes and thus represents a very worthwhile investment from the economic point of view.

In addition, Table 5 shows the undiscounted value of benefits and costs and average annual value of benefits and costs (over the period of 20 years). On an annual basis, the proposed facility is expected to generate benefits worth on average nearly $40 million which would be offset by costs amounting to an average annual value of $16.9 million.

Table 5: Detailed Breakdown of Benefits and Costs, 3% Discount Rate, Undiscounted Benefits and Costs, and Average Annual Benefits and Costs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Benefits and Costs Category** | **Mean (Expected Value) $M** | **Probability of Not Exceeding Value Shown** | | **Total (Not Discounted Sum), $M** | **Average Annual Value, $** |
| **10% Probability** | **10% Probability** |
| *BENEFITS* | | | | | |
| Psychological, Safety, and Health Benefits to Staff and Inmates |  |  |  |  |  |
| Cost of Injury Treatment Prevented | $0.09 | $0.01 | $0.20 | $0.13 | $6,587 |
| Cost Savings from Reduction in Sick Leave by Staff | $2.90 | $2.90 | $2.90 | $4.21 | $210,352 |
| Cost Savings Due to Prevented Suicides (Life & Inquest) | $15.67 | $4.28 | $29.66 | $22.81 | $1,140,412 |
| Total Psychological, Safety, and Health Benefits | $18.66 | $7.22 | $32.67 | $27.15 | $1,357,350 |
| Future Psychiatric and Health Care Costs Avoided |  |  |  |  |  |
| General Hospital Treatment Costs | $24.99 | $9.12 | $43.76 | $36.96 | $1,848,090 |
| E.R./Acute Assessment Costs | $0.47 | $0.33 | $0.62 | $0.69 | $34,731 |
| Psychiatric Treatment Costs | $28.17 | $9.11 | $52.38 | $41.65 | $2,082,276 |
| Forensic Psychiatric Beds Costs | $96.70 | $31.23 | $170.14 | $142.63 | $7,131,389 |
| Total Future Health Care Costs Avoided | $150.33 | $79.15 | $230.29 | $221.93 | $11,096,485 |
| Prison, Justice Administration, and Victimization Costs |  |  |  |  |  |
| Total Cost of Justice Administration | $4.49 | $4.37 | $4.60 | $6.59 | $329,625 |
| Prison Costs Saved from STU Diversion | $359.87 | $278.18 | $440.80 | $523.00 | $26,149,793 |
| Total Reduction in Victim Costs from Diversion | $0.26 | $0.11 | $0.46 | $0.38 | $19,239 |
| Total Prison and Justice Costs Avoided | $364.62 | $282.91 | $445.52 | $529.97 | $26,498,656 |
| Reduced Re-contacted Recidivism |  |  |  |  |  |
| Annual Police and Administrative Costs | $2.21 | $2.21 | $2.21 | $3.27 | $163,393 |
| Total Re-contacted Recidivism Costs Avoided | $2.21 | $2.21 | $2.21 | $3.27 | $163,393 |
| Child Benefits due to Reduced MIFO Mother Recidivism |  |  |  |  |  |
| Foster Care Costs Avoided | $0.78 | $0.47 | $1.18 | $1.16 | $58,126 |
| Total Foster Care Costs Avoided | $0.78 | $0.47 | $1.18 | $1.16 | $58,126 |
| Benefits Due to Increased Employability |  |  |  |  |  |
| Benefits from Employment of MIFOs | $6.07 | $2.56 | $10.24 | $8.93 | $446,579 |
| Welfare Payment Reductions | $3.63 | $1.84 | $5.24 | $5.36 | $268,066 |
| Total Increased Employability Benefits | $9.70 | $5.81 | $14.12 | $14.29 | $714,645 |
| **Total Benefits** | **$546.30** | **$438.45** | **$659.77** | **$797.77** | **$39,888,656** |
| *COSTS* |  |  |  |  |  |
| Capital | $31.90 |  |  | $33.35 | $1,667,384 |
| Clinical O&M Costs | $110.99 |  |  | $160.41 | $8,020,494 |
| Physician costs | $16.64 |  |  | $24.06 | $1,202,751 |
| Non-Clinical O&M | $25.36 |  |  | $36.65 | $1,832,640 |
| Follow-up and Continuum of Care Cost | $9.21 |  |  | $13.73 | $686,730 |
| Corrections Costs | $47.74 |  |  | $68.99 | $3,449,675 |
| **Total Costs** | **$241.84** |  |  | **$337.19** | **$16,859,672** |
| *NET BENEFITS* |  |  |  |  |  |
| Net Benefits (NPV), $M | $304.46 | $196.60 | $417.93 | $460.58 | $23,028,984 |
| Internal Rate of Return | 43.45% | 32.47% | 54.38% | 43.82% |  |
| Benefit-Cost Ratio | 2.26 | 1.81 | 2.73 | 2.37 |  |

# Appendix 1: Summary of Input Assumptions

Table 6 in this Appendix lists all model input assumptions that were used to simulate the benefit-cost model and provides the sources of information that was used to populate them.

The table shows the range of uncertainty assumed for certain model inputs deemed as uncertain. These ranges of uncertainty are expressed as Low Value, Median or Most Likely Value, and High Value. The @Risk Realized Value provides the expected value for the input based on the assumed probability distributions and the identified low/median/high values. The uncertain inputs are shaded in blue.

Appendix 2 provides a detailed discussion on input assumptions development.

Table 6: Model Input Assumptions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **@ RISK REALIZED or Assumed Value** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| **Mentally Ill Female Offenders (MIFOs) - Study Group** |  |  |  |  |  |  |
| Occupancy Level | % | 0.980 | 0.931 | 0.980 | 1.000 | The Royal |
| Daily Average Number of Residents |  | 58.8 | 55.9 | 58.8 | 60.0 | The Royal. Reflects the capacity for 60 residents |
| Average STU Treatment Stay | years | 0.41 | 0.38 | 0.41 | 0.44 | The Royal |
| **Treatment Group Size, Number of MIFOs Treated** | #/year | **143.1** | **127.4** | **143.1** | **156.4** | Calculated from above inputs |
| **Psychological, Safety, and Health Benefits to Staff and Inmates** |  |  |  |  |  |  |
| Baseline Rate of Incidents | #/inmate annually | 1.20 | 0.9463 | 1.2429 | 1.4255 | Based on counts of female offenders involved in incidents from 2008 to 2013. Median: average over the period; Low: minimum value over the period; High: maximum value over the period |
| Expected reduction in incidents in proposed FSTU | % | 0.47 | 28% | 50% | 66% | Based on counts of female offenders and residents of STU involved in incidents from 2008 to 2013 and counts of injuries by severity and calculated reduction in rate from RTC to STU (minimum, average, and maximum). |
| Percent of incidents that result in injuries | % | 0.57 | 50% | 57% | 64% | Based on counts of female offenders involved in incidents from 2008 to 2013 and counts of injuries by severity. Low: minimum share of incidents with injuries; High: maximum share of incidents with injuries; Median: average of the two values |
| Yearly Injuries by Inmate to Self or Other Inmate Avoided | Incidents /inmate | 0.36 | 0.130 | 0.351 | 0.601 | Calculation from inputs above |
| Yearly Injuries by Inmate to Staff Avoided | Incidents /inmate | 0.005 | 0.004 | 0.005 | 0.005 | Based on CSC data on staff injuries over the period 2008-2013 (low, high, and average implied injury rates) |
| Average Cost of Injury Treatment | $/incident | $228 | $0 | $54 | $1,150 | Low: Assumed zero; cost minimal, limited to over the counter medication application; Median: Average physician fee; High: Average cost of hospital stay. |
| **Cost of Injury Treatment Prevented** |  | **$4,912** | **$0** | **$1,129** | **$41,814** | Calculated from above inputs |
| Staff to Inmate Ratio | #/inmate | 0.450 | 0.450 | 0.450 | 0.450 | Combined ratio of sum of provincial and federal inmates divided by the number of correctional officers. Number of federal correctional officers assumed equal to 42% of the total count of staff. Ombudsman Ontario and CSC data On staff and inmates count. |
| Number of correctional officers involved in supervision of MIFOs | number | 26.5 | 25.2 | 26.5 | 27.0 | Calculation from inputs above. |
| Average Yearly Sick Leave Taken by correctional officer | sick days/year | 20.60 | 20.6 | 20.6 | 20.6 | Based on data from CSC and reports regarding recent absenteeism of correctional officers in Ontario. |
| Implied days of sick leave eliminated | Number of days | 545.56 | 518.28 | 545.56 | 556.69 | Calculation from inputs above. |
| Average Cost of Sick Leave (correctional staff replacement) | $/ per corr. officer annually | $5,923 | $5,923 | $5,923 | $5,923 | Based on information on the costs of staff replacement, 2010 Annual Report of the Auditor General, Section 4.02. |
| Average Daily Cost of Sick Leave | $/staff sick day | $288 | $288 | $288 | $288 | Calculated from above inputs |
| **Cost Savings from Reduction in Sick Leave by Staff** |  | **$156,862** | **$149,019** | **$156,862** | **$160,063** | Calculated from above inputs |
| MIFO Base Suicide Rate | #/year | 0.00179 | 0.00027 | 0.00089 | 0.00371 | Low: US Bureau of Justice Statistics, suicide rate for female jail inmates. Median: Rate for Canadian male inmate population, Daigle and Naud (2012). High: Rate of planned suicides in Canadian female inmate population; Derkzen et. al. CSA (2012). |
| MIFO STU Suicide Rate | #/year | 0.00000 | 0.00000 | 0.00000 | 0.00000 | All suicides prevented in STU environment (rate for treated MIFOs). |
| Value of Life of a Completed Suicide | $/suicide | $1,276,461 | $950,589 | $1,176,842 | $1,654,176 | Low: US study on economic impact of suicides (value inflated to 2013 dollars, assumes approximate parity of US and Canadian dollars). Median: New Brunswick 1996 study on costs of suicides, value inflated to 2013 dollars. High: Study on road accident costs by deLeur (2010), fatality costs relevant to suicides, values inflated to 2013 dollars. |
| Cost of Inquest | $/case | $6,800,000 | $3,600,000 | $6,800,000 | $10,000,000 | Low: Assumed to $3.6 million based on the reports regarding costs of legal fees for inquest into the death of Ashley Smith. High: Assumed at $10 million, a reasoned assumption regarding minimum total cost Ashley Smith inquest. Median: average of low and high values |
| **Cost Savings Due to Prevented Suicides (Life & Inquest)** |  | **$850,419** | **$68,633** | **$417,444** | **$2,594,220** | Calculated from above inputs |
| **Future Psychiatric and Health Care Costs Avoided** |  |  |  |  |  |  |
| Base Case Future Psychiatric & Health Care Cases | cases/ MIFO | 0.605 | 0.48 | 0.61 | 0.73 | Low: Recidivism and Use of Services, page 1290, percent of mentally ill offenders hospitalized within 18 months after release from prison. Mean: Psychiatric Hospitalizations, Arrests Emergency Room Visits, page 2 (156). Percent of individuals with persistent serious mental illness hospitalized in last 6 months (includes those with and without prior arrests).High: Assumed 20% higher than mean. Rate based on outcomes for males and females. |
| General Hospital Cases Avoided | cases/ year | 87 | 61 | 87 | 114 | Calculated from above inputs |
| Reduction in Future General Health Care Cases | % | 90% | 90% | 90% | 90% | From Hospital to Home: The Transitioning of Alternate Level of Care and Long-stay Mental Health Clients, page 11. Inferred rate; 10% of psychiatric patients needed to be re-hospitalized. FSTU will also provide a general health care with which most of the non-psychiatric health problems should be expected to get stabilized. |
| Cost per Patient-day in the General Hospital | $/Patient-Day | $1,725.00 | $1,150 | $1,725 | $2,300 | Low: Average cost of hospital stay $/day, Highlights of 2008–2009 Inpatient Hospitalizations and Emergency Department Visits, CIHI 2010. High: Assumed at twice the value of median based on higher rates charged to un0insured Canadians. Median: Average of high and low values. |
| Average Length of Stay in General Hospital | days/ case | 10.8 | 3 | 8 | 20 | Based on values reported in “Hospital Mental Health Services in Canada, 2009–2010”, CIHI, 2012 |
| **General Hospital Treatment Costs Avoided** |  | **$1,448,346** | **$189,923** | **$1,078,672** | **$4,717,222** | Calculated from above inputs |
| Number of ER/Acute Care Hospitalization Cases | # cases | 87 | 61 | 87 | 114 | Incidence assumed equal to general health care cases and hospitalizations |
| ER Room Visit Costs (Admin & Physician) | $/ case | $349.5 | $233.0 | $349.5 | $466.0 | As for costs of patient-day in general hospitals. The cost ER visit was augmented by the cost of physician charge. |
| Decrease in ER Admissions | % | 90% | 90% | 90% | 90% | Assumed equal to general health care cases and hospitalizations. |
| **E.R./Acute Assessment Costs** |  | **$27,219** | **$12,827** | **$27,319** | **$47,788** | Calculated from above inputs |
| Psychiatric (Specialty) Hospital Use | % of inmates | 25.0% | 25.0% | 25.0% | 25.0% | “Recidivism and Use of Services Among Persons With Mental Illness After Release From Prison”, page 1293. The rate used refers to percent of study subjects who were hospitalized for mental health reasons after release from prison. |
| Post-treatment Psychiatric Hospital Use | % of inmates | 10% | 10% | 10% | 10% | From Hospital to Home: The Transitioning of Alternate Level of Care and Long-stay Mental Health Clients, page 11, percent of psychiatric patients transferred to community which need to be re-hospitalized. |
| Psychiatric (Specialty) Cost | $/case per day | $1,958 | $1,305 | $1,958 | $2,611 | Assumed equal to a multiple of 1.135 of general hospital costs “The Cost of Mental Health and Substance Abuse Services in Canada”, Institute of Health Economics, June 2010. |
| Average Psychiatric Treatment Length | days | 38.83 | 5 | 22 | 140 | Based on values reported in “Hospital Mental Health Services in Canada, 2009–2010”, CIHI, 2012 |
| **Psychiatric Treatment Costs** |  | **$1,631,877** | **$124,723** | **$924,497** | **$8,577,135** | Calculated from above inputs |
| Forensic Psychiatric Beds Costs | $/day | $2,247 | $1,594 | $2,247 | $2,899 | Psychiatric specialty hospital costs increased by imputed security costs. Security cost based on CSC audit of Regional Treatment Centres. |
| Average Length of Stay for Forensic Bed Use | days/ case | 190.8 | 30 | 150 | 365 | No source for systematic analysis identified but various sources point out that the length of stay in forensic facilities can vary from a few weeks to a few years (e.g. Providence Care http://www.providencecare.ca/cms/sitem.cfm/clinical\_services/forensic\_psychiatry/). For the purpose of this analysis, the following assumptions were made. Low was assumed at 1 month, mean was assumed equal to the length of treatment in the proposed FSTU, and high was assumed at 1 year. |
| Inmates Receiving Forensic Care Treatment Post-release | % | 9% | 9% | 9% | 9% | Forensic Hospital Diversion Pilot Program, Florida Senate, Interim Report 2011-106, October 2010, page 1 and 2. Number of individuals in forensic treatment units divided by total population of inmates with mental illness. More specific follow-up studies were not identified. |
| **Forensic Psychiatric Beds Costs** |  | **$5,588,862** | **$555,247** | **$4,394,159** | **$15,082,025** | Calculated from above inputs |
| **Prison, Justice Administration, and Victimization Costs** |  |  |  |  |  |  |
| Legal Aid Costs | $/case | $1,012.40 | $810 | $1,012 | $1,215 | Median: Expenditures on legal aid (criminal matters) divided by number of criminal court cases adults and youth 2011/2012 inflated to 2013. Direct expenditures on legal aid were adjusted upwards by 24.4% to account for other related legal aid expenditures (extrapolation based on “Cost of Crime in Canada” 2008 report). Low and High represent 80% and 120% of median, respectively. |
| Prosecution Costs | $/case | $1,217.44 | $977 | $1,202 | $1,466 | “Cost of Crime in Canada” 2008 report Table 3, page 10 Median: main 2008 estimate. Low: unadjusted main estimate. High: main estimate multiplied by 1.22 to account for increase in number of appearances. All estimates inflated to 2013 dollars. |
| Court Costs | $/case | $1,549.80 | $1,244 | $1,530 | $1,866 | “Cost of Crime in Canada” 2008 report, Table 2, page 9. Median: main 2008 estimate. Low: unadjusted main estimate. High: main estimate multiplied by 1.22 to account for increase in number of appearances. All estimates inflated to 2013 dollars. |
| Policing/Administrative Costs | $/offense | $9,772.00 | $9,772 | $9,772 | $9,772 | “Cost of Crime in Canada” 2008 report, Table 1, page 9. Total police cost related to crimes divided by 2 based on the notion that some of this cost is related to preventing crimes rather than to processing of actual cases. Inflated to 2013 dollars. |
| **Court/Prosecution/Legal Aid Costs Avoided** |  | **$1,938,968** | **$1,631,494** | **$1,933,869** | **$2,239,901** | Calculated from above inputs |
| Annual O&M cost of incarceration in regular correctional facilities | $/inmate/ year | $317,529 | $226,772 | $317,529 | $408,286 | Low: Average incarceration costs in women's facilities; Corrections and Conditional Release Statistical Overview, 2012, Table B3, 2010/2011 estimate inflated to 2013 dollars. High: The funding Requirements and Impact of the "Truth in Sentencing Act" on the Correctional System in Canada; projected cost of incarceration of Renee Acoby, for 2013/2014, page100. Median: Assumed as average of low and high. |
| Capital cost (capitalized ongoing maintenance, replacement cost, etc.) | $/inmate/ year | $14,107 | $14,107 | $14,107 | $14,107 | The funding Requirements and Impact of the "Truth in Sentencing Act" on the Correctional System in Canada. Table 13-C, inflated to 2013 dollars |
| Length of Incarceration | Years /inmate | 0.41 | 0.38 | 0.41 | 0.44 | HDR; assumed equal to the stay at FSTU. |
| **Prison Costs Avoided from Diversion** |  | **$19,500,218** | **$11,773,581** | **$19,500,218** | **$28,964,117** | Calculated from above inputs |
| Property Offences Committed by Group | # offences | 21 | 19 | 21 | 23 | Kathleen Hartford et.al. "Trends in Police Contact with Persons with Serious Mental Illness in London, Ontario", Slide 25, type of charges laid on individuals with serious mental illness. About 15% of charges are property crimes. This is used as rate to calculate the number of cases |
| Property Stolen/Damaged Cost | $/offense | $3,081 | $986 | $1,421 | $11,813 | Data cited in “Net Federal Fiscal Benefit of CSC Programming” Conference Board of Canada 2009, Table 2, page 10. Low: value of property damage for property crimes. Median: total victim costs for property crimes. High: total victim costs for robbery crimes. All values inflated to 2013 dollars. |
| **Costs of Property Stolen - Avoided** |  | **$66,114** | **$18,847** | **$30,498** | **$277,184** | Calculated from above inputs |
| **Administrative, Legal and Policing Cost Savings due to Reduced Recontacted Recidivism** |  |  |  |  |  |  |
| Percentage of MIFO's Re-Arrested (Base) | % | 0.53 | 0.53 | 0.53 | 0.53 | The Dangerous Mentally Ill Offender Program: Cost Effectiveness 2.5 Years After Participants’ Prison Release, Washington State Institute for Public Policy, January 2007, Exhibit 3, 1.5 year follow-up. Recidivism for any offense for control group of mentally ill offenders. |
| Treated MIFO Re-arrest Rate | % | 0.31 | 0.31 | 0.31 | 0.31 | The Dangerous Mentally Ill Offender Program: Cost Effectiveness 2.5 Years After Participants’ Prison Release, Washington State Institute for Public Policy, January 2007, Exhibit 3, 1.5 year follow-up. Recidivism for any offense for group of treated dangerous mentally ill offenders. |
| Number of Contacts per Relapsed/untreated MIFO Per Year | arrests/ MIFO | 6 | 6 | 6 | 6 | Kathleen Hartford et.al. "Trends in Police Contact with Persons with Serious Mental Illness in London, Ontario", Slide 18, mean number of contacts with police for individuals with serious mental illness. |
| Policing Costs Associated with Arrests | $/ arrest | $678.0 | $678.0 | $678.0 | $678.0 | Kathleen Hartford et.al. "Trends in Police Contact with Persons with Serious Mental Illness in London, Ontario", Slide 40, total London, ON police costs associated with events involving individuals with serious mental illness (definite cases), and slide 16, number of contacts. Inflated to 2013 dollars. |
| **Total Police Costs** |  | **$128,051** | **$114,045** | **$128,051** | **$139,997** |  |
| **Child Benefits due to Reduced MIFO Mother Recidivism (Only After Year 2)** |  |  |  |  |  |  |
| Percentage of MIFOs Who Are Mothers | % | 64.93% | 59% | 67% | 70% | AECF Children of Incarcerated Mothers. U.S. Fact sheet. (Med) S. Bayes. Canadian Children. 2007. |
| Average Number of Minor Children per Mother | #children/mother | 2.64 | 2.38 | 2.4 | 3 | Low: Canadian Children of Prisoners. Bayes, 2007. (Med, Hi) US. Dept of Justice, 1999; Average # years at the time of incarceration =8; remain minor for 10 years. |
| Children that will Require Foster Care | % | 15.88% | 9.50% | 10% | 25% | AECF Children of Incarcerated Mothers: Factsheet |
| Cost of Foster Care | $/case per child | $12,500.00 | $10,000 | $12,500 | $15,000 | Low: based on basic foster care rates reported for BC and press (Globe and Mail, Feb 19, 2012 article). High assumed 50% higher due to additional payments for additional level of care that may be required. Median is assumed as the average of high and low. |
| **Child Annual Foster Care** |  | **$199,747** | **$64,981** | **$118,188** | **$540,000** | Calculated from above inputs |
| **Benefits Due to Increased Employability (Only After Year 2)** |  |  |  |  |  |  |
| Base Case Employment Rate | % | 26.17% | 10% | 23% | 44% | Crime and Unemployment. John Howard Society of ON. 2009. |
| Post-treatment Employment Rate | % | 36.66% | 15% | 28% | 63% | Female Inmate Employment Study. CSC. |
| Increase in Employment Rate | % | 11.98% | 5% | 10% | 20% | Assumed by HDR based on inputs above. |
| Benefits from Income of Employed MIFO | $/year | $20,412 | $10,400 | $20,413 | $30,424 | Female Inmate Employment Study. CSC. |
| **Employment Income Benefits to MIFO's** |  | **$349,983.6** | **$66,266.3** | **$292,066.2** | **$951,843.1** | Calculated from above inputs |
| Average Welfare Benefits | $/year | $11,280 | $7,512 | $11,280 | $13,272 | Based on schedule of welfare benefits in Ontario (October 2013). Low: single applicant. Median: single parent with children. High: couple with children. |
| MIFOs Relying on Welfare at the time of Incarceration | % | 27.40% | 15% | 27% | 40% | (Lo) DOJ, 1999. |
| Treated FOs Relying on Welfare | % | 13.15% | 0% | 12% | 25.00% | Female Inmate Employment Study. CSC. |
| Reduction in MIFO on welfare |  | 13.02% | 5% | 15% | 20% | Assumed by HDR based on inputs above. |
| **Costs of Welfare Avoided** |  | **$210,083** | **$47,863** | **$242,091** | **$415,224** | Calculated from above inputs |
| **COSTS** |  |  |  |  |  |  |
| Continuum Visits per Year | visits/year | 6.00 | 1 | 6 | 12 | HDR |
| Continuum of Care Costs - Outpatient and Case Management | $/MIFO\* visit | $281 | $211 | $281 | $351 | HDR |
| **Continuum of Care Costs - Outpatient and Case Management** | **$/year** | **$240,958** | **$26,825** | **$240,958** | **$658,594** | Calculated from above inputs |
| Number of years of follow-up | Number | 3 |  |  |  |  |

Table 7: Costs of the Proposed FSTU

|  |  |
| --- | --- |
| **Costs Category** | **Amount in $** |
| Construction - Total Cumulative |  |
| Capital Construction Costs | $33,347,670 |
| Operation and Maintenance – Annual |  |
| Clinical O&M Costs | $7,638,565 |
| Physician costs | $1,145,477 |
| Non-Clinical O&M | $1,745,371 |
| Corrections Costs | $3,285,405 |

Table 8: Assumptions regarding Recidivism Rates

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Offender Group** | **Time Period** | | | |
| **Less than 1 year** | **1-2 year** | **2-3 year** | **Total** |
| Baseline | 45.0% | 15.0% | 10.0% | ***70.0%*** |
| After Treatment of Mental Health Issues | 28% | 7% | 5% | ***40%*** |
| **Difference (Reduction in Recidivism)** | ***17.0%*** | ***8.0%*** | ***5.0%*** |  |

# Appendix 2: Development of Updated Input Assumptions

This Appendix documents the development of updated input assumptions for this cost-benefit assessment. This includes a brief discussion of available evidence and selection/development of the actual updated input values.

## Discount Rate to Discount Future Costs and Benefits

### Data Assumptions Used, Discussion and Update

The 2011 study used a discount rate of 8% based on Treasury Board (TB) recommendations for an appropriate real discount rate for the evaluation of regulatory interventions in Canada. This recommendation has been initially developed in 2007 for a cost-benefit analysis guide document intended as a guidance and resource document for the federal departments in support for regulatory submissions.[[2]](#footnote-3)

This guide has not been updated, and the TB still is referring to this rate as the appropriate discount rate for economic evaluations of regulatory proposals and lists these guidelines under its “Guidelines and Tools” web page.[[3]](#footnote-4)

The discount rates and their magnitude have been the topic of much discussion in government and academia. The rate of 8% seems high, in particular in current economic conditions of low inflation and interest rates; lower rates have been suggested and used by some organizations.

The TB also states that in certain circumstances where consumer consumption is involved and there are no or minimal resources involving opportunity costs (such as certain human health and environmental goods and services), the social discount rate (social time preference rate) can be used for the purpose of discounting future costs and benefits. Usually these social discount rates are lower than 8%. For Canada, the social time preference rate has been estimated to be around 3%. This social discount rate should be accompanied by the use of a shadow price of investment that is applied to all costs of the intervention that result in a postponement or reduction of investment activity.[[4]](#footnote-5) This approach – although recognizes the use of a lower discount rate – raises the issue of the appropriate definition of the shadow price of capital and what that price should be.

In the US, the applicants for recent transportation infrastructure grants were advised to *discount future benefits and costs* to present values using a real discount rate of 7 percent, following guidance provided by OMB in Circulars A–4 and A–94 (http://www.whitehouse.gov/omb/circulars\_default/) but were also allowed to provide an alternative analysis using a real discount rate of 3 percent. [[5]](#footnote-6) The guidance document stated that they should use the latter approach when the alternative use of funds to be dedicated to the project would be for other public expenditures, rather than private investment.

The US Environmental Protection Agency uses a two-stage discounting procedure. In the first stage, capital costs are converted to annualized consumption equivalents by using an estimate of the pre-tax private rate of return to generate the annual stream of costs (foregone consumption), typically 7%. Then all costs and benefits are discounted using the social discount rate of 3%. This approach is a variant of the shadow price of capital approach in that capital costs are adjusted upward to reflect the social cost of displaced investment before benefits and costs are discounted at the consumption rate of interest.[[6]](#footnote-7)

In the UK, the discount rates, which should be used to convert all costs and benefits to present values, are provided in the HMT Green Book issued by the UK’s HM Treasury Department. The Green Book provides the discount rate which should be applied over different periods as shown in the table below. The discount rate is assumed to fall for very long periods because of uncertainty about the future.

Table 9: United Kingdom Green Book Recommended Discount Rates

|  |  |
| --- | --- |
| **Years of Analysis** | **Discount Rate** |
| 0-30 | 3.5% |
| 31-75 | 3.0% |
| 76-125 | 2.5% |
| 126-200 | 2.0% |
| 201-300 | 1.5% |
| 301 and over | 1.0% |

Source: Cost-Benefits Analysis, Transport Analysis Guidance (TAG) Unit 3.5.4, UK Department of Transport, August 2012

There are also examples of organizations that use lower discount rates to assess their future liabilities, justified partly by a low interest rates environment. For example, the City of Ottawa uses currently a rate of 3.25%.[[7]](#footnote-8)

Based on the above review of information, it is suggested to still use the discount rate of 8% in the main scenario based on TB guidelines. A rate of a similar magnitude is still being used across many jurisdictions. A rate of 3% can then be used as a scenario and alternative presentation based on UK practice, tests recognized by US federal departments, and practices of certain public organizations.

## Psychological, Safety, and Health Benefits to Staff and Inmates

### Data/Assumptions Used

The table below shows the input values used in the 2011 model.

Table 10: Input Assumptions for Psychological, Safety, and Health Benefits to Staff and Inmates

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Yearly Injuries by Inmate to Self or Other Inmate | incidents/ inmate | 0.002 | 0.012 | 0.016 | World Health Organization, Suicide Prevention – Country Reports and Charts, Geneva, 2003; Rate of self-injury of inmates to self. Women Offenders and Self-Harm (rates expressed in per 100,000 population) |
| Yearly Injuries by Inmate to Staff | incidents/inmate | 0.010 | 0.010 | 0.010 | <http://www.oci-bec.gc.ca/rpt/annrpt/annrpt20092010-eng.aspx> |
| Average Cost of Injury Treatment | $/incident | $56 | $100 | $800 | Cost of Crime Canada, 2008, CAD, page 11 |
| Current Average Yearly Sick Leave Taken | sick days/year | 22 | 35.2 | 48.4 | 2008 Annual Report of the Auditor General of Ontario. Adult Institutional Services, Chapter 3; Section 3.02. |
| Reduction in Sick Leave Days Per Inmate | days/ inmate | 13.75 | 22 | 30.8 | Calculation from inputs. |
| Staff to Inmate Ratio | #/inmate | 0.625 | 0.636 | 0.636 | 2008 Annual Report of the Auditor General of Ontario. Adult Institutional Services, Chapter 3; Section 3.02. |
| Average Daily Cost of Sick Leave | $/sick day | 110 | $170 | $230 | << calculated from 2008/09 cost of replacement & salary of a corrections worker/day; 2008 Annual Report of the Auditor General of Ontario. Adult Institutional Services, Chapter 3; Section 3.02. |
| MIFO Base Suicide Rate | #/year | 0.00012 | 0.0006 | 0.0008 | World Health Organization, Suicide Prevention – Country Reports and Charts, Geneva, 2003 |
| MIFO STU Suicide Rate | #/year | 0.00000 | 0.00000 | 0.000127 | <<All suicides prevented; treated rate. Special Offender Presentation for the male STU |
| Value of Life of a Completed Suicide | $/suicide | $433,000 | $535,158 | $849,878 | Suicide Cost. Library of Parliament, New Brunswick; 1996 dollars. |
| Cost of Inquest | $/case | $477 | $2,202 | $2,936 | Coroner’s Report, Audit, BC 2008. Based on average Salary Range, 39K to 181K. |

### Discussion of Data and Input Updates

#### Injuries by Inmate to Self and Other Inmates

Data on injuries to inmates and staff is limited. The best source of information that was identified is a 2010 research paper by Correctional Services Canada (CSC) that collected and examined data on self-harm from Canadian federal prisons. A summary of this data, by type of institution, is shown in . Some of that data refers specifically to women’s institutions and regional treatment centres. The rates at these facilities may be comparable to rates more specific to MIFO’s.

Table 11: Data on Self-Injury

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of Institution** | **Average Number of Incidents** | **Number of Institutions** | **Average number of Beds** | **Implied Rate (per Inmate Annually)** |
| Max/Multi | 42.6 | 10 | 336 | 0.127 |
| Medium | 16.5 | 20 | 389 | 0.042 |
| Minimum | 0.5 | 17 | 205 | 0.002 |
| RTC | 55.4 | 5 | 140 | 0.396 |
| Women’s | 37.2 | 5 | 94 | 0.396 |

Source: Arthur Gordon, “Self-Injury in CSC Institutions over a Thirty-Month Period” Correctional Services Canada, December 2010, Table 5. Implied rate calculated by HDR assuming 100% occupancy.

The table below shows data on all incidents involving female offenders recorded in CSC tracking system by level of injury. The table suggests that many incidents affect inmates in a way which causes only minimal or no injury.

Table 12: Female Offenders Involved in Incidents by Level of Injury (All Incident Types)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Injury Severity** | **2008-2009** | **2009-2010** | **2010-2011** | **2011-2012** | **2012-2013** | **Total**  **2008-2012** | **Average Annual** |
| Death | 2 | 1 |  |  |  | 3 | 0.6 |
| Serious Bodily Injury | 7 | 8 | 5 | 5 | 3 | 28 | 5.6 |
| Non-Serious Bodily Injury | 247 | 292 | 482 | 460 | 498 | 1979 | 395.8 |
| None | 254 | 353 | 290 | 447 | 344 | 1688 | 337.6 |

Source: Data obtained from CSC. The original source of data is the internal corporate reporting system (CRS).

A more detailed data by type of incident suggests that a small share of incidents may be random events that can occur in any circumstances, even outside of a correctional institution. Two types of incidents, death from natural causes and medical emergencies were classified as such and the corresponding counts of injuries were removed from the injury count shown in . The results are shown below in . The table also shows the number of offenders and implied incident rate.

Table 13: Female Offenders Involved in Incidents by Level of Injury: Adjusted Incident Counts and Injury Rates (Per Inmate Annually)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Injury Severity** | **2008-2009** | **2009-2010** | **2010-2011** | **2011-2012** | **2012-2013** | **Total** |
| *Count of Offenders Involved Incidents* | | | | | | |
| Death | 0 | 0 | 0 | 0 | 0 | 0 |
| Serious Bodily Injury | 7 | 7 | 5 | 5 | 2 | 26 |
| Non-Serious Bodily Injury | 230 | 282 | 451 | 430 | 470 | 1,863 |
| None | 239 | 333 | 260 | 426 | 332 | 1,590 |
| Percent of Incidents with Injuries | 49.8% | 46.5% | 63.7% | 50.5% | 58.7% | 54.3% |
| *Inmate Population and Implied Rate of Incidents (Number per Inmate, Annually)* | | | | | | |
| Female Inmate Count | 503 | 509 | 581 | 604 | 602 | 2,799 |
| Incident Rate | 0.9463 | 1.2220 | 1.2324 | 1.4255 | 1.3355 | 1.2429 |

Source: Count of Injuries: CSC CRS; Inmate Population: Compiled by HDR from annual reports of the Office of the Correctional Investigator and CSC.

The data shown in the table above indicates that the rates of incidents and injuries for MIFO’s may be much higher than those used in the 2011 model. It should be noted, however, that the annual reports for the male Secure Treatment Unit (St. Lawrence Valley Correctional and Treatment Centre) show that some incidents still take place within an STU environment. Therefore, it is unlikely that in the proposed female STU the incident rates will fall to zero.

Given the lack of data from institutions similar to the contemplated FSTU, the proposed approach is to use the incident rates from the existing male STU as a proxy for the expected reduction in incident rates for MIFOs that would be housed in the FSTU. For example, the data presented in suggests that the rate of all incidents is expected to fall by about half (from 1.2429 per inmate to 0.624 per FSTU resident, or about 28% to 66%).

This implies a higher figure than that in the 2011 model. However, not all offenders involved in an incident sustain any injury and thus likely do not require treatment and do not cause a medical cost. Based on data shown earlier in , 50 to 60 percent of inmates involved in an incident becomes injured.[[8]](#footnote-9) Therefore, the estimated number of offenders involved in incidents is adjusted by the injury rate before it is evaluated in terms of implications for cost of injury treatment.

Table 14: Self-Injuries and Assaults in Existing Male STU (St. Lawrence Valley Correctional and Treatment Centre

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **2008** | **2009** | **2010** | **2011** | **2012** | **Total (and Average Rates)** |
| *Count of Incidents* |  |  |  |  |  |  |
| Number of self-injuries | 33 | 19 | 18 | 41 | 56 | **167** |
| Threats/Assaults | 49 | 102 | 115 | 186 | 202 | **654** |
| *Inmate population and Implied Rate of Incidents (# per Inmate, annually)* |  |  |  |  |  |  |
| Number of admissions | 256 | 250 | 283 | 259 | 267 | **1315** |
| Implied Incident Rate (per Resident Annually) | 0.320 | 0.484 | 0.470 | 0.876 | 0.966 | 0.624 |
| Reduction in Incidents compared to Women’s institutions | 66.2% | 60.4% | 61.9% | 38.5% | 27.6% | 49.8% |

Source: from THE ROYAL annual report for the men’s STU.

The proposed coefficient updates are shown in the table below. As discussed, the list of inputs is expanded to capture more correctly the difference in incident rates between the regular correctional institution and the FSTU as well as the fact that not all offenders involved in incidents become injured.

Table 15: Proposed Model Input Updates

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Baseline Rate of Incidents | #/inmate annually | 0.9463 | 1.2429 | 1.4255 | Based on counts of female offenders involved in incidents from 2008 to 2013. Median: average over the period; Low: minimum value over the period; High: maximum value over the period |
| Expected reduction in incidents in proposed FSTU | % | 28% | 50% | 66% | Based on counts of female offenders and residents of STU involved in incidents from 2008 to 2013 and counts of injuries by severity and calculated reduction in rate from RTC to STU (minimum, average, and maximum). |
| Percent of incidents that result in injuries | % | 50% | 57% | 64% | Based on counts of female offenders involved in incidents from 2008 to 2013 and counts of injuries by severity. Low: minimum share of incidents with injuries; High: maximum share of incidents with injuries; Median: average of the two values |

#### Injuries by Inmate to Staff

Current figure in the model is based on a figure referred to in the 2009-2010 annual report of the office of correctional investigator as the reported staff injuries during the course of inmate management (139 injuries, page 41). In the most recent report for FY 2011-2012 this statistic is not mentioned.

CSC provided the data shown in on staff injuries during incidents. The data is for both male and female correctional institutions.

Table 16: Staff Injuries During Incidents and Injury Rates

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Incident Type** | **2008-2009** | **2009-2010** | **2010-2011** | **2011-2012** | **2012-2013** | **Total** |
| *Non-Serious Injury* |  |  |  |  |  |  |
| Accident | 8 | 6 | 5 | 7 | 11 | 37 |
| Assault On Staff | 51 | 42 | 47 | 40 | 14 | 194 |
| Assault On Staff - Fluids/Waste |  |  |  |  | 11 | 11 |
| Assault On Staff - Physical |  |  |  |  | 18 | 18 |
| Attempted Escape | 1 |  |  |  |  | 1 |
| Attempted Suicide |  |  |  |  | 1 | 1 |
| Cell Extraction |  |  | 2 |  | 1 | 3 |
| Damage To Government Property |  |  |  |  | 1 | 1 |
| Disciplinary Problems | 3 | 7 | 3 | 2 | 5 | 20 |
| Fire | 1 |  | 5 |  |  | 6 |
| Inmate Fight | 1 |  | 1 |  |  | 2 |
| Medical Emergency |  | 1 | 5 | 1 | 2 | 9 |
| Other | 3 | 2 | 5 |  |  | 10 |
| Possession Of Contraband | 2 |  |  |  |  | 2 |
| Possession Unauthorized Item | 1 | 1 |  |  |  | 2 |
| Self-Inflicted Injuries | 2 | 2 |  |  | 1 | 5 |
| Threaten Staff | 3 |  |  |  |  | 3 |
| Non-Serious Bodily Injury Total | 76 | 61 | 73 | 50 | 65 | 325 |
| *Serious Injury* |  |  |  |  |  |  |
| Assault On Staff |  |  | 2 | 1 | 2 | 5 |
| Other | 1 |  |  |  |  | 1 |
| Possession Of Contraband |  |  |  |  | 1 | 1 |
| Serious Bodily Injury Total | 1 |  | 2 | 1 | 3 | 7 |
| *Total Injuries and Rates of Injury* |  |  |  |  |  |  |
| Total Number of Injuries | 77 | 61 | 75 | 51 | 68 | 332 |
| Total Inmate Population | 14,163 | 14,091 | 14,402 | 14,440 | 15,440 | 72,536 |
| Implied Injury Rate (# per inmate annually) | 0.0054 | 0.0043 | 0.0052 | 0.0035 | 0.0044 | 0.0046 |

Source: Injury counts: CSC; Total Inmate Population: compiled by HDR from annual reports of the Office of Correctional Investigator.

Although assaults of inmates/residents on staff are still likely to occur in the contemplated FSTU, it can be reasonably assumed that – because of better staff training – such instances would be rare and resulting injuries (if any) would be minimal. Therefore, it is assumed that they would be equal to zero.

The table below provides the proposed coefficient update.

Table 17: Proposed Model Coefficient Update

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Injuries by Inmate to Staff | # injuries per inmate annually | 0.0035 | 0.0046 | 0.0054 | Based on CSC data on staff injuries over the period 2008-2013 (low, high, and average implied injury rates) |

#### Cost of Injury Treatment

Data specific to the costs of treatment of injuries suffered in prison was not identified. The 2011 model uses data from the 2008 Cost of Crime in Canada. This report, in turn, based those figures on more general costs of health care in Canada: cost of physician visit, ER visit, etc.

Based on January 22, 2013 newly released information from the Canadian Institute for Health Information (CIHI), the average physician fee is $54.[[9]](#footnote-10)

Also based on CIHI information, the average cost of an emergency department visit amounted in 2008 to $166 (or $179 in 2013 dollars) plus physician costs.[[10]](#footnote-11) Some insurance companies offering insurance policies for uninsured residents of Canada or visitors to Canada quote charges to residents as high as $500 per emergency visit.[[11]](#footnote-12)

A widely cited CIHI 2008 study on the costs of hospital states that the average cost of hospitalization amounts to over $7,000 per stay.[[12]](#footnote-13) Average hospital stay amounts to about 7 days.[[13]](#footnote-14) This implies an average daily cost of about $1,000 (in 2005 dollars, or $1,150 in 2013 dollars).

The proposed model inputs update is shown in the table below. It should be pointed out that the vast majority of injuries are not serious. They may require little treatment/intervention and thus the cost of injury treatment is assumed to be equal to zero at the lower end of the probability distribution.

Table 18: Proposed Model Coefficient Update

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Average Cost of Injury Treatment | $/injury or case | $0 | $54 | $1,150 | Low: Assumed zero; cost minimal, limited to over the counter medication application; Median: Average physician fee; High: Average cost of hospital stay. |

#### Annual Sick Leave

The figure in the 2011 model is based on the data mentioned in the 2008 Annual Report of the Auditor General. More recent reports are structured differently and do not report these statistics.

The specific point in the 2008 report was that many correctional officers were working 12-hour shifts. Therefore, one of their sick days represented an equivalent of 1.5 of a standard 8-hour work day and amounted to 32.5 days based on an 8-hour work day.

Following that report the ministry undertook some initiatives to address the issues and reduce the absenteeism. A 2010 report and reports in Globe and Mail suggest that in 2010 the average sick days amounted to 20.6 days based on an 8-hour day.[[14]](#footnote-15) Data obtained from CSC also suggest a similar figure for federal correctional officers, 157 hours or 19.6 days (in terms of 8-hour equivalent days) suggesting a reduction in the average amount of sick leave.

The table below shows the proposed update.

Table 19: Proposed Model Coefficient Update

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Current Average Yearly Sick Leave Taken | sick days/year |  | 20.0 |  | Based on data from CSC and reports regarding recent absenteeism of correctional officers in Ontario. |

#### Staff to Inmate Ratio

The figure in the 2011 model is based on the number of inmates and correctional officers mentioned in the 2008 Annual Report of the Auditor General (about 8800 inmates and 5,500 staff in the Adult Institutional Services in the Ministry of Community and Correctional Services). More recent reports are structured differently and do not report these statistics.

Other more current sources provide the following information:

* Ombudsman Ontario: “The Code – Facts and Highlights”, a statistical resource accompanying the release of the report on investigation into the use of force in Ontario correctional facilities, “The Code” June 2013.[[15]](#footnote-16)
  + Average daily inmate count: 8,802
  + Correctional officers on active duty:3,265
* CSC data, count of staff and inmates as of March 31, 2013
  + Count of inmates: 15,440
  + Count of staff: 18,243. 42% working in Correctional Services; 15% in Welfare Programs; 28% nurses, psychologists, HR, trades, financial advisors and other.

Table 20: Proposed Model Coefficient Update

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Staff to Inmate Ratio | #/inmate |  | 0.4504 |  | Combined ratio of sum of provincial and federal inmates divided by the number of correctional officers. Number of federal correctional officers assumed equal to 42% of the total count of staff (correctional services only). Ombudsman Ontario and CSC data in staff and inmates count. |

#### Daily Cost of Sick Leave

The figure in the 2011 model is based on the data mentioned in the 2008 Annual Report of the Auditor General (the cost of staff replacement and overtime due to officers calling in sick, a total of $20 million).

The 2010 Annual Report of the Auditor General reports that this cost has been reduced by a net of $1.4 million (after subtracting attendance incentives) over 9 months. This implies a cost of $18.13 million in 2010. Inflating this figure to 2013 gives $19.16 million, or $5,885 per correctional officer in Ontario.

The table below provides the suggested update. It should be noted that the input is expressed in terms of the annual cost per correctional officer (rather than per sick day).

Table 21: Proposed Model Coefficient Update

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Cost of sick leave | $/ per staff annually |  | $5,885 |  | Based on information on the costs of staff replacement, 2010 Annual Report of the Auditor General, Section 4.02. |

#### MIFO Base Suicide Rate

In 2009 the suicide rate in Canada amounted to 17.9 per 100,000 for males and 5.3 for females per 100,000.[[16]](#footnote-17)

Mental illness is known to be one of the major risk factors for suicide and thus the rate for MIFOs is likely much higher than the rate for the general population cited above. Studies show that up to 90% of people who take their own lives have depression, substance abuse problems or another mental disorder—whether diagnosed or not—at the time of their suicide. Most people who attempt or complete suicide don’t necessarily want to die; rather they want to escape their overwhelming emotional pain. According to some research, 10% to 15% of people with a mental illness will end up taking their own lives.[[17]](#footnote-18)

Prison populations are also reported to have much higher suicide rates than the general population. Based on a recent study from the US Bureau of Justice Statistics, the suicide rate in jails for 2010 amounted to 43 per 100,000 (43 for men and 27 for women).[[18]](#footnote-19) The rate in federal and state prisons was much lower (9 and 16 per 100,000, respectively). However, other countries such as the UK report a much higher rate (an average of 133 per 100,000, or 184 per 100,000 for women and 129 per 100,000 for men).[[19]](#footnote-20)

In the Canadian context, one paper reports that the rate of suicides in prisons is 6 to 11 times higher than for the general population and reports a rate of 89 per 100,000 for men. However, little is known about the rate for women due to their small number in prison population and thus a smaller number of actually completed suicides.[[20]](#footnote-21) A recent CSC study of mental health needs of federally sentenced women offenders found that 2 out of 240 women offenders had a plan for suicide and 1 out of 269 in the comparison sample had such plans.[[21]](#footnote-22) Translating these to suicide rates results in rates as high as 371 per 100,000 in the comparison sample to 833 per 100,000 in the study sample. In addition, over 20% of women in both the study sample and the comparison sample had a suicide attempt in the preceding 5 years.

below shows the proposed model input update based on the identified data described above.

Table 22: Proposed Model Coefficient Update for MIFO Base Suicide Rates

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| MIFO Base Suicide Rate | #/year per inmate | 0.00027 | 0.00089 | 0.00371 | Low: US Bureau of Justice Statistics, suicide rate for female jail inmates.  Median: Rate for Canadian male inmate population, Daigle and Naud (2012).  High: Rate of planned suicides in Canadian female inmate population; Derkzen et. al. CSA (2012). |

#### Cost of Suicide

In the 2011 model, the cost of suicide was based on a study of suicide cases in New Brunswick. This study concluded that the mean total cost estimate per suicide death in 1996 was $849,877. This estimate includes direct costs for health care services, autopsies, funerals and police investigations as well as indirect costs in the form of lost productivity due to premature death.[[22]](#footnote-23) Although this value is low, it should be noted that inflating it to 2013 costs using CPI for all of Canada (multiplying by 1.38) gives a value of $1,176,842.

More recent studies of the economic cost or economic burden of suicide were not identified. An alternative source that was identified was for the economic burden of injury in general that also includes suicide. The most recent version of this report is for 2009.[[23]](#footnote-24) However, this report is not very useful for the purpose of this study as in the analysis suicides were combined with other non-fatal self-harm (resulting in hospitalization, emergency visits, rehabilitation, disability, etc.) and the cost was presented for the total group. The total cost for this group (including direct and indirect cost is estimated at $2,442 million. Dividing it by the number of suicide deaths (which is conceptually incorrect as this total cost covers also non-fatal incidents of self-harm) gives a cost per case of $675,332.

This figure is quite low compared to the Value of Statistical Life figures that appear in literature in various contexts. For example, in the context of transportation, the recommended figures for valuation of safety improvements that reduce the number of fatalities are often in the range of $5-$10 million per fatality. It should be noted, however, that these estimates express largely willingness to pay to avoid risks that may lead to a fatality (e.g. willingness to pay for improvements that would reduce the risk of being killed by a certain percentage). Since these risks are not relevant to the issues of suicide, the implications of this research may not be transferable to the valuation of life lost to suicides.[[24]](#footnote-25)

Another approach could be based, perhaps, on the detailed research results for transportation accidents and extract cost items which may also be relevant for suicides. This is done in Table 23 below based on a 2010 Canadian study of accident costs. Based on the data presented in this table, the cost of a suicide would amount to about $1.57 million ($1,654,176 in 2013 dollars).

Table 23: Transportation Accident Costs that Result in a Fatality which May Be Relevant to Suicide, $/Victim

|  |  |
| --- | --- |
| **COST CATEGORY** | **AMOUNT** |
| ***Direct Costs*** |  |
| Emergency response |  |
| Police | $5,884 |
| Ambulance | $548 |
| Coroners | $1,812 |
| Health Services |  |
| Acute Care | $9,156 |
| Legal Costs |  |
| Funeral | $8,887 |
| Productivity/Disruption Costs |  |
| Short-term Work Place Disruption Costs | $3,882 |
| **Total Direct** | **$30,169** |
| ***Indirect Costs (Human Capital Costs)*** |  |
| Discounted Future Earnings |  |
| Long-term Income Loss | $1,392,531 |
| Household Productivity and Disruption Costs | $74,957 |
| Pain and Suffering |  |
| Pain and Grief | $67,830 |
| **Total Indirect** | **$1,535,318** |
| **GRAND TOTAL COST** | **$1,565,487** |

Source: Compiled by HDR from Paul de Leur, “Collision Cost Study”, prepared for Capital Region Intersection Safety Partnership, February 2010.

The desktop research on suicide costs valuations in other jurisdictions identified the sample of results shown below. Note that the figures for New Zealand and UK include lost quality of life and willingness to pay to avoid the loss of life which are not explicitly included in other studies.

* New Zealand: $2,483,000 per case, in $NZ for 2002 and in 2004 dollars.[[25]](#footnote-26)
* UK: 1.45 million pounds in 2009.[[26]](#footnote-27)
* US: $886,247 in 2010 ($950,589 in 2013 dollars).[[27]](#footnote-28)

The above figures show a fairly wide valuation range. below shows the proposed model input update based on the above discussion. These assumptions are fairly conservative given studies which show even higher valuations.

Table 24: Proposed Model Coefficient Update for Suicide Rate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Value of Life of a Completed Suicide | $/suicide | $950,589 | $1,176,842 | $1,654,176 | Low: US study on economic impact of suicides (value inflated to 2013 dollars, assumes approximate parity of US and Canadian dollars).  Median: New Brunswick 1996 study on costs of suicides, value inflated to 2013 dollars.  High: Study on road accident costs by deLeur (2010), fatality costs relevant to suicides, values inflated to 2013 dollars. |

#### Cost of Inquest

The data on the costs of inquests and coroners services is not readily available. Only British Columbia publishes some budget information on their coroners’ services. The most recent 2011 audit of BC Coroners Services shows that the Service has annual expenditures of about $13-15 million and conducts about 7,000-8,000 death investigations.[[28]](#footnote-29) This implies an average cost of about $1,800 per death investigation (that also may include an inquest).

The BC Coroners Service 2010 Annual Report also suggests that a large portion of the budget is spent on inquests. Given that there were 11 inquests conducted in that year, the average cost per inquest is significant. Although more detailed data on the expenditure structure was not available and a precise estimate for the cost of an inquest could not be calculated the data that is available could be used to calculate an approximate order-of-magnitude cost as below. This calculation is based on the data indicating that inquests, together with other forensic services and travel account for 3.1% of total budget (or $410,711). Then allocating this cost equally between the three categories of costs that account for it implies a total cost of all inquests of $136,924, or $12,448 per inquest. Adding to this average salary costs and autopsies/toxicology testing costs gives a total cost of $13,944 per inquest. Inflating this figure to 2013 dollars using the Consumer Price Index (from Statistics Canada) gives a total cost of $14,769.[[29]](#footnote-30)

Table 25: Calculation of the Inquest Cost

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cost/Budget Item** | **Share of Total** | **Value** | **Per Death Investigation**  **(7,825 Deaths)** | **Source and Comments** |
| *Total BCCS Budget Breakdown* |  |  |  |  |
| Total Budget | 100% | $13,200,000 | $1,687 | BC Coroners Service 2010 Annual Report, page 13. |
| Salaries and Benefits | 48.7% | $6,428,400 | $822 |  |
| Support Service Costs | 6.2% | $818,400 | $105 |  |
| Direct Service Costs | 45.1% | $5,953,200 | $761 |  |
| Autopsies, Toxicological, Body Handling | 42.0% | $5,542,429 | $708 |  |
| Other Direct Costs | 3.1% | $410,771 |  |  |
| Inquests (Court and Related Costs) |  | $136,924 |  | Assumes1/3 of "Other Direct" |
| Other Forensic Services |  | $136,924 |  | Assumes1/3 of "Other Direct" |
| Travel |  | $136,924 |  | Assumes1/3 of "Other Direct" |
| *Imputed Approximate Costs of Inquest (per Inquest)* |  |  |  |  |
| Court and Related Costs |  | $12,448 |  | Based on 11 inquests. |
| *Add:* |  |  |  |  |
| Salaries and Benefits Share |  | $822 |  | Assumes the same labour effort as for an average investigation. This is likely a conservative assumption. |
| Autopsies, Toxicological, Body Handling Share |  | $708 |  | Assumes the same expenditures as for other death investigations. |
| **Total Cost of Inquest (per Inquest)** |  | **$13,977** |  |  |
| **Total Cost of Inquest (per Inquest) Inflated to 2013** |  | **$14,769** |  | 2010 cost figure inflated to 2013 dollars using the inflation rate of 5.7% (based on Statistics Canada Consumer price index 2010-August 2013). |

The costs of inquests can be highly variable depending on the circumstances and in certain cases likely exceed the cost calculated in

Table 25. For example, in Ontario, on average the inquest is reported to take 3 to 5 days, although for some type of inquests in certain years the average amounted to 23.5 days.[[30]](#footnote-31)

However, there are reasons to believe that costs of inquests into suicides committed in a correctional facility could be even much higher than these figures. By their nature, prison deaths are very difficult cases attracting a lot of attention and scrutiny. It can be reasonably expected that such inquests would involve reviews of a large amount of documentation, testimonies from a large number of witnesses representing multiple parties involved, etc. Currently ongoing inquest into the death of Ashley Smith may give an idea regarding the time and various costs. The press reported at the beginning of 2013 that the cost of just lawyer fees to the federal government had reached $3.6 million.[[31]](#footnote-32) Given this cost just for legal fees, it is quite possible that the total cost will run in the range of $10 million or more.

This information can be used to develop a range of variation in the costs of inquest for the purpose of this cost-benefit analysis.

**Table 26: Model Coefficient Update for Cost of Inquest**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Cost of Inquest | $/case | $3,600,000 | $6,800,000 | $10,000,000 | Low: Assumed to $3.6 million based on the reports regarding costs of legal fees for inquest into the death of Ashley Smith.  High: Assumed at $10 million, a reasoned assumption regarding minimum total cost of the Ashley Smith inquest.  Median: average of low and high values. |

## Future Psychiatric and Health Care Costs Avoided

### Data/Assumptions Used

below shows the input assumptions used in the 2011 model.

Table 27: Input Assumptions Used for the Category of Future Psychiatric Health Care Costs Avoided

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Base Case Future Psychiatric/Health Care Cases | cases/MIFO | 0.32 | 0.61 | 0.90 | Psychiatric Hospitalizations, Arrests Emergency Room Visits, page 7 |
| General Hospital Cases | cases/year | 16 | 59 | 119 | Calculated from above inputs |
| Reduction in Future General Health Care Cases | % | 10% | 10% | 10% | Source 1: ON, ALC Survey, 2006-2008. Source 2: Recid & Use of Services among MI Prisoners |
| Cost per Patient-day in the General Hospital | $/Patient-Day | $392.4 | $665.0 | $800 | (med) Recidivism & Use of Services Among Released Prisoners. 1 year follow up. |
| Average Length of Stay in General Hospital | days/case | 8 | 13.2 | 20 | CAMH. Hospital Report Card, 2007. (Hi) Economic Burden of MI in Canada. |
| Number of ER/Acute Care Hospitalization Cases | # cases | 16 | 59 | 119 | Incidence assumed equal to general health care cases and hospitalizations |
| ER Room Visit Costs (Admin & Physician) | $/case | $157.43 | $157.43 | $157.43 | 34.02+78.58 = 112.6 per visit, in 1994 dollars, adjusted to 2010. |
| Decrease in ER Admissions | % | 10% | 10% | 10% | Assumed equal to general health care cases and hospitalizations. |
| Psychiatric (Specialty) Hospital Use | % of inmates | 20.0% | 30% | 50% | Moloughney, B. Canadian Journal of Public Health, 2004. |
| Post-treatment Psychiatric Hospital Use | % of inmates | 10% | 10% | 10% | Based on cases released from treatment; Maryland Community Criminal Justice MH 1994 |
| Psychiatric (Specialty) Cost | $/case/days | $537 | $645 | $860 | Mental Health Hospital Report. 2011 dollars |
| Average Psychiatric Treatment Length | days | 7 | 53 | 62 | (Lo & Med) AB Mental Health Board. 2004. MH Care Use in Ontario. CIHR. Analysis In Brief. Taking Health Information Further (Hi) ON MH Care Use. 2006-2008. |
| Forensic Psychiatric Beds Costs | $/day | $480 | $633 | $1,301 | Analysis in Brief. CIHI. 2007-2008. |
| Average LOS for Forensic Bed Use | days/case | 12 | 185 | 358 | Analysis in Brief. CIHI. 2007-2008. |
| Inmates Receiving MH Treatment Post-release | % | 30% | 30% | 30% | Castillo, Alarid, 2011. Assumed to be incurred in Year 4 after incarceration. |

### Discussion of Data and Input Updates

Most of the inputs are based on research papers on mental illness; no new research was identified that would provide better and more up-to-date information. The inputs that can be updated refer primarily to health care costs. These are discussed below. A few inputs were refined after an additional review of sources. These are also discussed under a separate heading.

#### Cost of General Hospital, Emergency Department Visit

As discussed under the category of costs of injury treatment, based on CIHI information, the average cost of emergency department visit amounted in 2008 to $166 (or $179 in 2013 dollars) plus physician costs.[[32]](#footnote-33) Some insurance companies offering insurance policies for uninsured residents of Canada or visitors to Canada quote charges to non-residents as high $800 per emergency visit.[[33]](#footnote-34)

A widely cited CIHI 2008 study on the costs of hospital states that the average cost of hospitalization amounts to over $7,000 per stay.[[34]](#footnote-35) Average hospital stay amounts to about 7 days.[[35]](#footnote-36) This implies an average daily cost of about $1,000 (in 2005 dollars, or $1,150 in 2013 dollars). Insurance companies offering insurance policies for uninsured residents of Canada or visitors to Canada, quote charges to residents as high as $3,000 per day and even $8,000 per day in intensive care. Whitehorse Hospital charges a daily rate of $2,101 to uninsured residents and $4,202 to non-residents of Canada.[[36]](#footnote-37)

Table 28: Model Coefficient Update for General Hospital Costs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Cost per Patient-day in the General Hospital | $/Patient-Day | $1,150 | $1,725 | $2,300 | Low: Average cost of hospital stay $/day, Highlights of 2008–2009 Inpatient Hospitalizations and Emergency Department Visits, CIHI 2010.  High: Assumed at twice the value of median based on higher rates charged to un-insured Canadians. Median: Average of high and low values. |

#### Average Length of Stay in General Hospital

As mentioned above, the average hospital stay amounts to about 7 days. Based on a recent report from CIHI, the stays for mental illness are somewhat longer. The median stay is 8 days and the average 18.3. Depending on the condition, the median varies between 3 to 21 days and the average between 7.3 and 39 days.[[37]](#footnote-38) For organic disorders, schizophrenia and psychotic disorders, the stay tends to be longer and for substance abuse the stay is shorter.

Table 29: Model Coefficient Update for Average Length of Stay in Hospital

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Average Length of Stay in General Hospital | days/case | 3 | 8 | 20 | Based on values reported in “Hospital Mental Health Services in Canada, 2009–2010”, CIHI, 2012 |

#### Average Psychiatric Treatment Length

Based on a recent report from CIHI, the median length of stay for primary mental illness in a psychiatric hospital amounts to about 22 days. This figure is stable over the period investigated from 2006 to 2010. However, the average length of stay amounts to about 80 days (implying a highly skewed distribution of stays). For some disorders the median and average are even much higher. For example, for schizophrenia and psychotic disorders the median amounts to 35 days and the average 144.6 days, for organic disorders the median amounts to 63 days and the average to 196 days.[[38]](#footnote-39) At the same time, however, for certain other conditions, the stays are shorter. For example for mood disorders and anxiety disorders, the median is 23 and 28 days, respectively, and the average is 46 and 41 days, respectively.

Table 30: Model Coefficient Update for Average Psychiatric Treatment Lenght

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Average Psychiatric Treatment Length | days | 5 | 22 | 140 | The same as for average stay in general hospital. |

#### Psychiatric (Specialty) Hospital Cost

No new data and cost estimates were identified. One possible approach is to use the cost of the general hospital and a multiplication factor for psychiatric hospitals of 1.135 suggested in a study on mental health costs in Canada.[[39]](#footnote-40)

Table 31: Model Coefficient Update for Psychiatric Hospital Costs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Psychiatric (Specialty) Cost | $/case/days | $1,305 | $1,958 | $2,611 | Assumed equal to a multiple of 1.135 of general hospital costs “The Cost of Mental Health and Substance Abuse Services in Canada”, Institute Of Health Economics, June 2010 |

#### Forensic Bed Costs

No new data and studies on the costs of forensic beds were identified. However, it should be noted that in general a forensic hospital can be expected to have similar or greater costs (in terms of costs per bed) than the regular psychiatric hospital. The costs are likely to be greater because – by definition – it treats potentially more serious cases and requires some security measures.

A 2011 internal CSC audit of regional treatment centres provided information on budget allocations to these centres that broke out from the total amount the allocations related to the provision of mental health and health care services. Deducting these from the total budget allocation can be assumed to represent primarily the corrections and security costs. Dividing this by the number of beds gives then security costs per bed that could be treated as an approximation of security costs of a forensic hospital. The table below derives this cost for the Prairies Regional Treatment Centre. As this is a women’s facility, it can be considered most relevant to the proposed STU. The calculations displayed in the table show that the corrections and security cost amounted to $97,968 per bed annually or $268 per bed per day. Adjusting this figure to 2013 dollars (using a Consumer Price Index) gives $289 per bed per day. This amount can be added to the cost of the regular psychiatric hospital to obtain an estimate of costs of a forensic hospital bed.

Table 32: Budget Allocations to Prairies Regional Treatment Centre and Costs Allocations Per Bed, 2009-2010

|  |  |
| --- | --- |
| **Cost Category** | **Amount** |
| Total Budget Allocation | $26,147,124 |
| Funds Allocated for all Health Related Services | $8,806,859 |
| Implied Amount Related to Corrections and Security | $17,340,265 |
| Implied Corrections and Security Cost per Bed (177 occupied Beds), $ Annually | $97,968 |
| Implied Corrections and Security Cost per Bed (177 occupied Beds), $ per Day | $268 |
| Inflation Factor 2009-2013 | 1.076 |
| Implied Corrections and Security Cost per Bed (177 occupied Beds), $ per Day (2013 dollars) | $289 |

Source: Audit of Regional Treatment Centres and the Regional Psychiatric Centres, Internal Audit, January 5, 2011, CSC, Table 1.1 and Table 1.2. <http://www.csc-scc.gc.ca/publications/005007-2508-eng.shtml>

Table 33: Model Coefficient Update for Forensic Bed Costs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Forensic Psychiatric Beds Costs | $/day | $1,594 | $2,247 | $2,899 | Psychiatric specialty hospital costs increased by imputed security costs. Security cost based on CSC audit of Regional Treatment Centres. |

#### Other Updates and Refinements

A few inputs were refined and corrected after reassessment of sources reviewed for the 2011 analysis. shows the detailed assumptions and sources for the outstanding inputs.

In addition, it was assumed that the benefits in the form of avoidance of future health care and psychiatric care costs will continue some time into the future (i.e. beyond the first year) after release from the proposed FSTU. It seems intuitive the benefits of improved health status from STU will last for some time. However, the literature does not provide much empirical evidence or guidance on the likely duration of treatment benefits (in addition to reduced recidivism). As a conservative assumption, it was assumed that these benefits would continue at the same rate as the reduced recidivism, the recidivised cases avoided would also carry the benefit of reduced future psychiatric and health care costs.

## Prison Justice Administration, and Victimization Costs

### Data/Assumptions Used

shows the input assumptions used in the 2011 model.

Table 34: Input Assumptions used in the 2011 Model

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Legal Aid Costs | $/case | $421 | $908 | $1,029 | Costs of Crime in Canada (2008, CAD), page 8. In today's dollars (Lo, Hi); ConBOC, 09. Parole &Property Crime. |
| Prosecution Costs | $/case | $1,309 | $1,309 | $1,309 | Costs of Crime in Canada (2008, CAD). |
| Court Costs | $/case | $1,257 | $1,482 | $1,572 | Costs of Crime in Canada (2008, CAD), page 8. In today's dollars (Lo, Hi) CBOC, 09. Parole &Property Crime. |
| Policing/Administrative Costs | $/offense | $7,571 | $9,464 | $11,356 | Costs of Crime in Canada (2008, CAD). Police Costs per Case, inflated to 2010 dollars. Total police cost related to crimes divided by 2 based on the notion that some of this cost is related to preventing crimes rather than to processing of actual cases. |
| Annual O&M cost of incarceration in regular correctional facilities | $/inmate/year | $160,012 | $242,933 | $325,855 | The funding Requirements and Impact of the "Truth in Sentencing Act" on the Correctional System in Canada. Table 11-KK (provincial, Lo), Table 11-CC (Federal, Hi). Projected costs for FY 2010/11. Median set to the average of the two. |
| Capital cost (capitalized ongoing maintenance, replacement cost, etc.) | $/inmate/year | $13,351 | $13,351 | $13,351 | The funding Requirements and Impact of the "Truth in Sentencing Act" on the Correctional System in Canada. Table 13-C, 2007/08 dollars inflated to 2010 $. |
| Length of Incarceration | years/inmate | 0.38 | 0.51 | 1.01 | HDR; assumed equal to the stay at FSTU. |
| Property Offences Committed of Group | # offences | 16 | 31 | 42 | Kathleen Hartford Research London ON, Mental Illness and Recidivism |
| Property Stolen/Damaged Cost | $/offense | 1,145.43 | 2,990 | 3,300.03 | CBOC, Victim Costs. P.10. For Assault, Property, Robbery. 2010 dollars, inflated. |

### Discussion of Data and Input Updates

For most of the inputs shown in , no new data was identified; the source documents used in the 2011 study were not updated or no new versions were identified in the public domain. The exceptions included some more recent data on incarceration costs in federal facilities and legal aid. Based on that data, the average cost in women’s facilities in 2010/11 amounted to $214,614 per inmate.[[40]](#footnote-41) This was assumed as the low value of incarceration cost. The high value of incarceration costs was sourced from the Impact of the Truth in Sentencing Act report in the form of estimated incarceration costs of Renee Acoby for Fiscal year 2013-2014. Renee Acoby may be a good example of a female inmate with which the correctional system is sometime dealing with and which could be avoided by diverting such cases early on to the proposed FSTU. The average legal aid cost per criminal case in 2011/2012 amounted to $986 per offence.[[41]](#footnote-42)

Given the general lack of updates to source reports for other input data, the old data was left mostly unchanged and monetary figures were inflated so that they are expressed in 2013 dollars. Certain adjustments were done to some inputs after re-assessment of sources reviewed for the 2011 analysis. shows the detailed input assumptions for this cost category.

## Administrative, Legal and Policing Cost Savings due to Reduced Re-contacted Recidivism

### Data/Assumptions Used

The table below shows the costs used in the 2011 analysis.

Table 35: Input Assumptions Used for Category of Administrative, Legal and Policing Costs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Percentage of MIFO's Re-Arrested | % | 0.57 | 0.57 | 0.57 | DMIO. COST EFFECTIVENESS 2.5 YEARS AFTER PARTICIPANTS’ PRISON RELEASE. 2007 Washington study |
| Treated MIFO Re-arrest Rate | % | 0.48 | 0.48 | 0.48 | DMIO. COST EFFECTIVENESS 2.5 YEARS AFTER PARTICIPANTS’ PRISON RELEASE. 2007 Washington study |
| Arrests per Relapsed MIFO Per Year | arrests/MIFO | 6 | 6 | 6 | Kathleen Hartford Research London ON, Mental Illness and Recidivism, Slide 20, times to contact, median is 56 days, 25% is 4 days, 75% is 265 days |
| Policing Costs Associated with Arrests | $/arrest | 80.95 | $140 | $188 | CBOC, 09. Table 2. Costs of Property, Robbery, and Assault related crime type (2010 inflation adjusted from 1996) |

### Discussion of Data and Input Updates

No new data and information regarding recidivism and re-arrests of MIFOs was identified. Therefore, the inputs were left mostly unchanged and only slightly adjusted after data re-assessment.

Kathleen Hartford et.al study was re-assessed as better suited for estimation of police costs due to re-contacted recidivism.[[42]](#footnote-43) The police costs in London, Ontario, related to processing cases with definite, probable, or possible serious mental illness was divided by the number of contacts involving such cases. The results are shown in the table below. shows the updated inputs.

Table 36: Policing Costs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Category of Cases** | **Police Costs**  **2001** | **Number of Contacts** | **Average Cost per Case** | **Average Cost per Case Inflated to 2013 dollars** |
| Definite SMI cases | $2,424,471 | 4,500 | $538.77 | $678.15 |
| Definite + probable cases | $3,665,562 | 6,800 | $539.05 | $678.50 |
| Definite + probable + possible SMI cases | $3,989,643 | 7,300 | $546.53 | $687.91 |

Source: Lisa Heslop, Kathleen Hartford, Hazel Rona, Larry Stitt, Ted Schrecker, and Jeff Hoch, “Trends in Police Contact with Persons with Serious Mental Illness in London, Ontario”

Table 37: Proposed Model Coefficient Update for Policing Costs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Percentage of MIFO's Re-Arrested (Base) | % | 0.53 | 0.53 | 0.53 | The Dangerous Mentally Ill Offender Program: Cost Effectiveness 2.5 Years After Participants’ Prison Release, Washington State Institute for Public Policy, January 2007, Exhibit 3, 1.5 year follow-up. Recidivism for any offense for control group of mentally ill offenders. |
| Treated MIFO Re-arrest Rate | % | 0.31 | 0.31 | 0.31 | The Dangerous Mentally Ill Offender Program: Cost Effectiveness 2.5 Years After Participants’ Prison Release, Washington State Institute for Public Policy, January 2007, Exhibit 3, 1.5 year follow-up. Recidivism for any offense for group of treated dangerous mentally ill offenders. |
| Number of Contacts per Relapsed/ untreated MIFO Per Year | arrests/MIFO | 6 | 6 | 6 | Kathleen Hartford et.al. "Trends in Police Contact with Persons with Serious Mental Illness in London, Ontario", Slide 18, mean number of contacts with police for individuals with serious mental illness. |
| Policing Costs Associated with Arrests | $/offence | $678.0 | $678.0 | $678.0 | Kathleen Hartford et.al. "Trends in Police Contact with Persons with Serious Mental Illness in London, Ontario", Slide 40, total London, ON police costs associated with events involving individuals with serious mental illness (definite cases), and slide 16, number of contacts. Inflated to 2013 dollars. |

## Other Model Updates

In addition to the above, the costs of foster care and welfare benefits were also updated based on more recent published rates. The updates are shown in the table below.

Table 38: Proposed Model Coefficient Updates for Costs of Foster Care and Welfare Payments

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable by Category** | **Unit** | **Low Value** | **Median or Most Likely** | **High Value** | **Sources and Comments** |
| Cost of Foster Care | $/case per child | $10,000 | $12,500 | $15,000 | Low: based on basic foster care rates reported for BC and press (Globe and Mail, Feb 19, 2012 article). High assumed 50% higher due to additional payments for additional level of care that may be required. Median is assumed as the average of high and low. |
| Average Welfare Benefits | $/year | $7,512 | $11,280 | $13,272 | Based on schedule of welfare benefits in Ontario (October 2013). Low: single applicant. Median: single parent with children. High: couple with children. |

## Potential Future Model Updates and Refinements

In future updates, this model could be further expanded and refined by including other very common costs related to incarceration of MIFOs, or costs more specific to this inmate group which here were not included or based only on proxy data. This would require Correctional Services Canada to provide the actual costs over and above the “regular” female incarceration costs of handling MIFOs in the prison. These costs would include the following cost categories:

Segregation costs;

Bailiff / transportation;

Costs of incidents, property damage, offender and CO injury, sick leave;

Use of internal mental health staff;

Transfers to other institutions, regional psychiatric centres etc.;

Medical costs related to treatment of self-injury;

Administrative and justice system costs related to charges added to the sentence as the result of mental health symptoms being interpreted and treated as violations, and

Costs of prison time added as the result of above.

# Appendix 3: References

Canadian Institute for Health Information, “Hospital Cost Drivers Technical Report”, 2009.

Canadian Institute for Health Information, “The Cost of Acute Hospital Stays by Medical Condition”, CIHI 2008.

Canadian Institute for Health Information, “Highlights of 2008–2009 Inpatient Hospitalizations and Emergency Department Visits, CIHI 2010.

Canadian Institute for Health Information, “Hospital Mental Health Services in Canada, 2009–2010”.

City of Ottawa 2012 Annual Report

Clarke, Gregory N., Heidi A. Herinckx, Ronald F. Kinney, Robert I. Paulson, David L. Cutler, Karen Lewis, and Evie Oxman, “Psychiatric Hospitalizations, Arrests, Emergency Room Visits, and Homelessness of Clients with Serious and Persistent Mental Illness: Findings from a Randomized Trial of Two ACT Programs vs. Usual Care”, *Mental Health Services Research*, September 2000, 2, 3, pp. 155-164.

Clayton, D. and A. Barcel, “The Cost of Suicide Mortality in New Brunswick, 1996”, New Brunswick Department of Health and Community Service.

Conference Board of Canada, “Net Federal Fiscal Benefit of CSC Programming”, 2009.

Constantine, Robert Ph.D., M.P.H,. Ross Andel, Ph.D. John Petrila, J.D., LL.M. Marion Becker, Ph.D., John Robst, Ph.D., Gregory Teague, Ph.D., Timothy Boaz, Ph.D., Andrew Howe, Pharm.D., “Characteristics and Experiences of Adults With a Serious Mental Illness Who Were Involved in the Criminal Justice System”, Psychiatric Services, ps.psychiatryonline.org, \_ May 2010 Vol. 61 No. 5

Correctional Services Canada, “Audit of Regional Treatment Centres and the Regional Psychiatric Centres”, Internal Audit, January 5, 2011.

Daigle, Marc S.; Naud, Helene, “Risk of Dying by Suicide Inside or outside Prison: The Shortened Lives of Male Offenders”, Canadian Journal of Criminology and Criminal Justice, October 2012, Vol. 54, No. 4.

Derkzen, Dena, Laura Booth, Ashley McConnell and & Kelly Taylor “Mental health Needs of Federal Women Offenders”, Correctional Services Canada, May 2012.

“Forensic Hospital Diversion Pilot Program”, Florida Senate, Interim Report 2011-106, October 2010.

From Hospital to Home: The Transitioning of Alternate Level of Care and Long-stay Mental Health Clients

Prepared by: Dale Butterill MSW, MPA; Elizabeth Lin, PhD; Janet Durbin, PhD; Yona Lunsky, PhD; Karen Urbanoski, PhD (Candidate); and Heather Soberman, MA, Health Systems Research and Consulting Unit Centre for Addiction and Mental Health, Toronto, ON, Prepared for: Ministry of Health and Long Term Care, September 2009

Gordon, Arthur, “Self-Injury in CSC Institutions over a Thirty-Month Period” Correctional Services Canada, December 2010,

Heslop, Lisa, Kathleen Hartford, Hazel Rona, Larry Stitt, Ted Schrecker, and Jeff Hoch , “Trends in Police Contact with Persons with Serious Mental Illness in London, Ontario”

de Leur, Paul, “Collision Cost Study”, prepared for Capital Region Intersection Safety Partnership, February 2010.

Institute of Health Economics, “The Cost of Mental Health and Substance Abuse Services in Canada”, June 2010.

Lovell, David, M.S.W. Gregg J. Gagliardi, Ph.D. Paul D. Peterson, Ph.D., “Recidivism and Use of Services Among Persons With Mental Illness After Release From Prison”, Psychiatric Services, http://psychservices.psychiatryonline.org , October 2002 Vol. 53 No. 10, pp 1290-1296.

Navaneelan, Tanya, “Health at a Glance. Suicide Rates: An Overview”, July 2012, Statistics Canada, Catalogue no. 82-624‑X

Noonan, Margaret E., Scott Ginder “Mortality in Local Jails and State Prisons, 2000-2011 - Statistical Tables”, US Department of Justice, Bureau of Justice Statistics, August 2013.

O’Dea D and Tucker S. 2005, *The Cost of Suicide to Society,* Wellington: Ministry of Health New Zealand.

Office of the Auditor General of British Columbia, “British Columbia Coroners Service”, Report 5: July 2011.

Office of Correctional Investigator, *Annual Reports*, various years.

Office of the Ontario Chief Coroner 2010 Report on Inquests, October 2012

Ontario Auditor General, *Annual Report 2010.*

Public Safety Canada, “Corrections and Conditional Release Statistical Overview”, 2012 Annual Report, December 2012

Treasury Board of Canada Secretariat*, Canadian Cost-Benefit Analysis Guide. Regulatory Proposals*, 2007.

UK Department of Health*, The National Service Framework for Mental Health – Five Years On,* December 2004.

Washington State Institute for Public Policy, “The Dangerous Mentally Ill Offender Program: Cost Effectiveness 2.5 Years After Participants’ Prison Release,” January 2007.

Zhang, Ting, “Cost of Crime in Canada”, report for the Department of Justice, 2008.

1. See: “Economic Analysis of Secure Treatment Unit for Mentally Ill Female Offenders”, a report for Royal Ottawa Health Care Group by HDR Corporation/Decision Economics, August 30, 2011. [↑](#footnote-ref-2)
2. *Canadian Cost-Benefit Analysis Guide. Regulatory Proposals*, Treasury Board of Canada Secretariat, 2007. [↑](#footnote-ref-3)
3. See <http://www.tbs-sct.gc.ca/rtrap-parfa/guides-eng.asp> [↑](#footnote-ref-4)
4. See <http://www.tbs-sct.gc.ca/rtrap-parfa/analys/analys07-eng.asp#Toc178397867>, Section 4.7. [↑](#footnote-ref-5)
5. 2013 Benefit-Cost Analyses Guidance for TIGER Grant Applicants, U.S. Department of Transportation’s (DOT) Transportation Investment Generating Economic Recovery (TIGER) 2013 discretionary grant program. [↑](#footnote-ref-6)
6. <http://www.epa.gov/ttn/ecas/econdata/Rmanual2/8.3.html> [↑](#footnote-ref-7)
7. City of Ottawa 2012 Annual Report. [↑](#footnote-ref-8)
8. Information on injuries (number of injuries and extent of injuries) is not available. [↑](#footnote-ref-9)
9. Doctors’ pay still growing, but slower than before. New metric provides a better picture of physician earnings, **January 22, 2013.** <http://www.cihi.ca/CIHI-ext-portal/internet/en/Document/spending+and+health+workforce/workforce/physicians/RELEASE_22JAN13>**.**  [↑](#footnote-ref-10)
10. “Hospital Cost Drivers Technical Report”, CIHI 2009. Does not include test/diagnostic costs or administration support. [↑](#footnote-ref-11)
11. See <http://www.david-cummings.com/documents/canadian_hospital_rates.htm> [↑](#footnote-ref-12)
12. “The Cost of Acute Hospital Stays by Medical Condition”, CIHI 2008. [↑](#footnote-ref-13)
13. Highlights of 2008–2009 Inpatient Hospitalizations and Emergency Department Visits, CIHI 2010. [↑](#footnote-ref-14)
14. See “Ontario prison guards get a raise in a time of restraint”, May. 23 2011, <http://www.theglobeandmail.com/news/politics/ontario-prison-guards-get-a-raise-in-a-time-of-restraint/article580779/> and 2010 Annual Report of the Auditor General, Section 4.02. [↑](#footnote-ref-15)
15. See <http://www.ombudsman.on.ca/Investigations/SORT-Investigations/Completed/The-Code.aspx>. [↑](#footnote-ref-16)
16. Navaneelan, Tanya, “Health at a Glance. Suicide Rates: An Overview”, July 2012, Statistics Canada, Catalogue no. 82-624‑X. [↑](#footnote-ref-17)
17. Based on Canadian Mental Health Association, BC Division, <http://www.cmha.bc.ca/get-informed/mental-health-information/suicide>. Similar statements/statistics can also be found on other sites, e.g. <http://depts.washington.edu/mhreport/facts_suicide.php>. [↑](#footnote-ref-18)
18. Margaret E. Noonan, Scott Ginder “Mortality in Local Jails and State Prisons, 2000-2011 - Statistical Tables”, US Department of Justice, Bureau of Justice Statistics, August 2013. [↑](#footnote-ref-19)
19. See *The National Service Framework for Mental Health – Five Years On,* UK Department of Health, December 2004, Table 3, page 36. It should be noted that the rates reported in the UK publication are based on “self-inflicted deaths” which also include accidents and misadventure. Confirmed suicides accounted for only 58% of the total number of deaths. If the rates are adjusted by this factor, they will turn out to be fairly consistent with the Canadian rate quoted in this description. [↑](#footnote-ref-20)
20. Daigle, Marc S.; Naud, Helene, “Risk of Dying by Suicide Inside or outside Prison: The Shortened Lives of Male Offenders”, Canadian Journal of Criminology and Criminal Justice, October 2012, Vol. 54, No. 4 [↑](#footnote-ref-21)
21. See Derkzen, Dena, Laura Booth, Ashley McConnell and & Kelly Taylor “Mental health Needs of Federal Women Offenders”, Correctional Services Canada, May 2012, Table 4, page 20. It should be noted that the report did not specified how the comparison sample was drawn. [↑](#footnote-ref-22)
22. Clayton, D. and A. Barcel, “The Cost of Suicide Mortality in New Brunswick, 1996”, New Brunswick Department of Health and Community Service. [↑](#footnote-ref-23)
23. *The Economic Burden of Injury in Canada,* SMARTRISK, 2009. [↑](#footnote-ref-24)
24. For example, US. Department of Transportation recommends an average value of $9.1 million (in 2012 dollars) with a range for sensitivity analysis for low/high of $5.2 million and $12.9 million. See US DOT, Guidance on Treatment of the Economic Value of a Statistical Life in U.S. Department of Transportation Analyses (2013 ), <http://www.dot.gov/office-policy/transportation-policy/guidance-treatment-economic-value-statistical-life> [↑](#footnote-ref-25)
25. O’Dea D and Tucker S. 2005, *The Cost of Suicide to Society,* Wellington: Ministry of Health New Zealand. This value also includes lost quality of life. [↑](#footnote-ref-26)
26. Assessing the Economic and Social Cost of Suicide and Attempted Suicide: Executive Summary, March 2011, a study for North of England Mental Health Development Unit. [↑](#footnote-ref-27)
27. See American Foundation for Suicide Prevention, <http://www.afsp.org/understanding-suicide/facts-and-figures>. This figure includes almost entirely lost wages and productivity. Based on the reported total impact of $34 billion (in 2010) and 38,364 cases. [↑](#footnote-ref-28)
28. “British Columbia Coroners Service”, Office of the Auditor General of British Columbia, Report 5: July 2011. [↑](#footnote-ref-29)
29. It should be pointed out that provincial coroners’ services in other provinces do not publish the details of their annual budgets. [↑](#footnote-ref-30)
30. Office of the Chief Coroner 2010 Report on Inquests, October 2012, page 38. [↑](#footnote-ref-31)
31. See Toronto Star, January 13, 2013, <http://www.thestar.com/news/gta/2013/01/13/ashley_smith_inquest_legal_fees_have_cost_ottawa_36_million_at_a_minimum.html>. [↑](#footnote-ref-32)
32. “Hospital Cost Drivers Technical Report”, CIHI. Does not include test/diagnostic costs or administration support. [↑](#footnote-ref-33)
33. See <http://www.david-cummings.com/documents/canadian_hospital_rates.htm> . It should be noted that these differences in costs may be due to some extent to differences in accounting methods, or how the various hospital costs are allocated to its various activities. [↑](#footnote-ref-34)
34. “The Cost of Acute Hospital Stays by Medical Condition”, CIHI 2008. [↑](#footnote-ref-35)
35. Highlights of 2008–2009 Inpatient Hospitalizations and Emergency Department Visits, CIHI 2010. [↑](#footnote-ref-36)
36. Fees for Hospital Treatment of Uninsured Residents and Non-Residents of Canada, Whitehorse General Hospital, June 2012. [↑](#footnote-ref-37)
37. “Hospital Mental Health Services in Canada, 2009–2010”, Canadian Institute for Health Information, 2012, Table 1a. [↑](#footnote-ref-38)
38. “Hospital Mental Health Services in Canada, 2009–2010”, Canadian Institute for Health Information, 2012, Table 1b. [↑](#footnote-ref-39)
39. “The Cost of Mental Health and Substance Abuse Services in Canada”, Institute Of Health Economics, June 2010, Page 23. [↑](#footnote-ref-40)
40. Corrections and Conditional Release Statistical Overview, 2012 Annual Report, Public Safety Canada, December 2012, Table B3. [↑](#footnote-ref-41)
41. Developed using the same approach and data sources as in the “Cost of Crime” in Canada 2008 report. [↑](#footnote-ref-42)
42. [↑](#footnote-ref-43)