

# **Societal Cost Impact Calculator**

Work Integration Social Enterprise (WISE) in Vancouver

*Calculator Method*

August 26, 2016

**Vancity**  
Community Foundation



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## **1. Introduction**

Social enterprises engage individuals in employment and other economic activities who are not welcome elsewhere. They offer opportunities where none existed in ways that can fill different needs for individuals, from casual work for people who may still be ‘street involved’, to short-term training positions, to long-term permanent positions for people who are further in their recovery. While there are a few specific case studies of the impact of individual social enterprises in Vancouver, and some research into the size and composition of the social enterprise sector in B.C., there is little analysis that connects social enterprises to the substantial research that exists about the impacts of meaningful work and community inclusion, and their role in reducing the societal costs of poverty.

To respond to this need, Vancity Community Foundation has developed a societal cost impact calculator. This calculator provides social enterprises with a straight forward means to make estimates of their impact based on data that they could reasonably gather, and which draws on empirically-supported research. The results of the calculator may be useful to government and others in showing how social enterprises are connected to important social and economic policy objectives, and the general direction and magnitude of their impact. This calculator is part of the project, *Measuring the Collective Impact of Social Enterprises in Vancouver that Provide Targeted Employment and Training*. This project has been made possible with funding support from Central City Foundation, Vancity Savings Credit Union, and Vancouver Foundation

### *Developing a Cost Calculator*

The societal costs of poverty in British Columbia are estimated to be \$8.1 to 9.2 billion a year, based on higher health care costs, crime costs, reduced economic productivity and the cost of poverty to future generations (Ivanova, 2011). This estimate is just one example of a sizeable body of research that has sought to identify and model the societal costs of poverty as well as the specific factors that influence the incidence of poverty.<sup>1</sup> This research is the basis for developing the calculator, along with establishing the pathway in which the activities of social enterprises contribute to reducing social inequity and poverty.

Recent experience in social impact measurement internationally has shown that impact measurement is challenging to do, particularly in measuring mid and long term outcomes. Small, grass root organizations have limited resources and technical expertise to measure and monetize impact.<sup>2</sup> The proposed calculator could provide a useful tool to social enterprises, and those that support social enterprise development, to illustrate social impact and to put it in context of other efforts to address poverty and community inclusion. By developing this calculator, social enterprises can focus on measuring what is most useful to them at an operational and planning decision-making level: how they can most

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<sup>1</sup> For a comprehensive bibliography see: National Council of Welfare (2011).

<sup>2</sup> SROI and CBA analysis typically need external funding and technical support. One review of SROI projects in the United Kingdom by Gordon (2009) found the cost ranges between £12-15,000 - £40,000 (approximately \$23-29,000 to \$77,000 Cdn). Also see the following references for a discussion of capacity: Arvidson, Lyon, McKay & Moro (2010), and E.T. Jackson and Associates (2012).

effectively engage the people who are marginalized in the social enterprise and to how to develop a successful business.

Developing a cost calculator is not new in the field of social impact measurement, but does not appear to have been applied to work-integration social enterprises (WISE).<sup>3</sup> For instance, the Capital for Health Families and Communities (2014) developed a Social Impact Calculator for its Low Income Investment Fund's program areas: affordable housing, early learning, education, health, and equitable transit oriented development. They leverage academic research to estimate impact and monetized value based on 'impact pathways' so that estimates of impact can be made based on data that can be collected fairly easily. In our case we leverage a wide range of research and modelling, such as recidivism models and economic input-output models, to develop a calculator that can be used by WISE social enterprises in Vancouver, and which could potentially be adapted to other contexts.

The outputs of this calculator can be integrated into methods which develop investment and decision-making ratios such as Social Return on Investment (SROI) and Cost-Benefit Analysis (CBA). For more information about these methods see Box 1. While SROI practitioners describe health, crime rate and other outcome indicators in impact models, social enterprises often do not have adequate outcome data to support the analysis, and many assumptions are needed to be able to ultimately calculate a ratio. Our societal cost calculator makes it easier to estimate impact by using existing empirical research to establish impact relationships. In this way, we can more reasonably estimate impact based on data that a social enterprise is likely to actually collect.

*Box 1. Social Return on Investment and Cost Benefit Analysis*

Social Return on Investment (SROI) combines a logic model approach with monetization of some outcomes to develop a discounted cash flow ratio that mirrors a Return on Investment ratio used in business. Cost Benefit Analysis (CBA) is a form of economic analysis for projects in which costs and benefits are quantified and compared for specific costs perspectives.

CBA and SROI are not interchangeable. For instance in SROI, all monetized outcomes ('financial proxies') are added, irrespective of whether they are private or public, or tangible or intangible. In contrast, CBA builds is based on economic welfare theory (and the notion of 'shadow prices' – intrinsic value that may not be represented by market transactions) and is careful to distinguish cost perspectives. A social cost (or benefit) is very specifically a change in the wealth of society. It does not, for example, include transfers in wealth, so an outcome that reduces income support payments does not change social costs (the level of wealth stays constant across society).

For applications of both methods to supportive employment and WISE social enterprise, see:

Cost Benefit Analysis:

- Rotz, Maxwell & Dunn (2015)
- Cimera (2002)
- Cimera (2009)

Social Return on Investment

- SROI Reports, EU EQUAL programme (Durie and Wilson, 2007; Durie, 2007)
- Atira Property Management Inc. (2013)

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<sup>3</sup> 'Work Integration Social Enterprises' (WISE) refers to social enterprises that provide jobs for disadvantaged workers as well as training, placement and other supports. These jobs can be transitional, stops on the way to integration into the mainstream labour market, or stable, long-term alternatives to existing mainstream jobs. WISEs' defining purpose is to help disadvantaged individuals who are at risk of permanent exclusion from the labour market, to integrate into work and society through productive activity, mainly through jobs (O'Connor & Meinhard, 2014).

## **2. Method Overview**

The calculator is set up as a predictive model based on base year data, currently set for 2015. Outcomes are estimated for a five year period.

### *Costing*

Costs are discounted to the base year using a discount rate of 3%, which is consistent with the social discount rate recommended by the Treasury Board of Canada (2007). All costs are in 2015 dollars (Cdn) unless otherwise noted. Where necessary, cost data sources are converted to 2015 dollars using the Consumer Price Index.<sup>4</sup>

All costs are calculated based on the number of individuals engaged by the social enterprise that ‘show a strong level of engagement’, which is a subset of the total number that are engaged.

Costs are described as:

- Public: fiscal implications in terms of public expenditures.
- Private: implications for the individuals who are marginalized and/or to other individuals. These can be both tangible (as measured in the market place), or intangible (not measured in the market place).

### *Definition of Social Enterprise*

The calculator is designed to be relevant to social enterprises that use different work integration models to engage individuals who are marginalized.<sup>5</sup> The user is asked to specify which model best characterizes them. The calculator will adjust calculations and parameters based on this setting.

Work integration social enterprises have different approaches for engaging individuals who are marginalized (Table 1). Some enterprises provide formal on-going employment, others short-term training opportunities, others legitimize informal economic activity, and others provide a mix of these approaches. All approaches involve the provision of a service and/or product, and all ultimately have a common objective to improve the stability, health and well-being of individuals who are marginalized. They also typically provide one-on-one support to enable individuals to succeed that is appropriate to an individual’s need.

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<sup>4</sup> Statistics Canada <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ46a-eng.htm>

<sup>5</sup> The term ‘individuals who are marginalized’ is used to describe a social enterprise’s target employees and/or participants who are socially and economically excluded in the community.

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*Table 1. Approaches for engaging individuals who are marginalized in work integration social enterprises*

<i>Enabling Economic Opportunities</i>	<i>Transitional Employment</i>	<i>On-going Employment</i>
<ul style="list-style-type: none"> <li>Validates and enables an existing economic activity (by reducing barriers, providing space, connecting sellers to buyers)</li> <li>Creates new economic opportunities (street newspaper, other product)</li> <li>Supports individuals who are marginalized to connect with work, or workplaces to connect with individuals who are marginalized.</li> </ul>	<ul style="list-style-type: none"> <li>Provides short-term training opportunities within a business setting.</li> <li>Supports individuals in connecting with the workforce upon graduation.</li> </ul>	<ul style="list-style-type: none"> <li>Hires an individual who is marginalized as an employee.</li> <li>Provides on-going employment</li> </ul>

Source: This categorization is based loosely on Davister, Defouny and Gregoire (2004). Our category, ‘on-going employment’ corresponds to two categories that they use: ‘creation of permanent self-financed jobs’ and ‘professional integration with permanent subsidies’. Our term ‘enabling economic opportunities’ corresponds to their category ‘socialisation through a productive activity.’

### **Model Coverage**

The calculator estimates impact and associated costs for the areas described in Table 2. Where possible, these are specific to Vancouver, B.C. Canada.

*Table 2. Costs included in the calculator*

<i>Type</i>	<i>Impact</i>	<i>Costs included</i>	<i>Key costs not included</i>
Health Related	Reduction in use of health care services for individuals living with mental illness	<ul style="list-style-type: none"> <li>Value of reduced hospital admissions and days in the hospital</li> <li>Value in reduced use of outpatient services</li> </ul>	<ul style="list-style-type: none"> <li>Ambulance services</li> <li>Private insurance payments</li> <li>Labour productivity</li> </ul>
	Reduction in health inequities (i.e. Differences in Health outcomes based on socio-economic status)	<ul style="list-style-type: none"> <li>Value of reducing pre-mature death and disabilities (DALY) for alcohol-related, medically-treatable, drug-induced and smoking-related deaths</li> <li>Value of reducing direct health care costs related to lowering the risk of certain diseases and injuries (associated with health inequities)</li> </ul>	



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<i>Type</i>	<i>Impact</i>	<i>Costs included</i>	<i>Key costs not included</i>
Crime related	Reduction in recidivism for individuals recently involved with the justice system	<ul style="list-style-type: none"> <li>• Avoided costs of incarceration, policing and justice system costs</li> <li>• Reduced loss of property</li> <li>• Reduced pain and suffering</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in crime for new offenders</li> </ul>
Economic Benefits	Income	<ul style="list-style-type: none"> <li>• Personal earnings from the social enterprise</li> <li>• Tax revenue, Employment Insurance premiums and Canada Pension Plan contributions</li> </ul>	<ul style="list-style-type: none"> <li>• WorkSafeBC premiums</li> <li>• Any earnings and tax/premiums besides that earned through the social enterprise</li> </ul>
	Changes in income assistance and other support payments (optional)	<ul style="list-style-type: none"> <li>• Income assistance</li> <li>• Short term shelter / social housing</li> </ul>	<ul style="list-style-type: none"> <li>• Extended health benefits</li> <li>• Food bank, clothing and other charitable support</li> </ul>
	Local Economic Impact	<ul style="list-style-type: none"> <li>• Direct impact from expenditures</li> <li>• Indirect income generated through procurement</li> <li>• Induced impacts from re-spending by those employed</li> </ul>	<ul style="list-style-type: none"> <li>• Indirect employment</li> <li>• Neighbourhood-level impacts (impacts are for Greater Vancouver)</li> </ul>

The model’s coverage reflect the current availability of empirical research. For instance, recidivism is included because recidivism models and statistically estimated parameters are well established. In contrast, it is more challenging to include the potential for work to prevent new criminal behaviour, so this cost was not included. Ideally the coverage of the model will improve over time as more research is conducted.

### **3. Detailed Calculations**

Detailed calculations are provided for each impact area described in Table 2. In each section below, we begin by summarizing research that relates to this area. We then outline the calculations and assumptions used in the calculator.

## A. Health-related impacts

While research on the health-related impacts of employing and engaging individuals who are marginalized in economic activities in social enterprises is relatively limited (see Box 2), a strong body of evidence exists that supports the link between positive health outcomes and reducing socio-economic inequities, such as income, social exclusion and unemployment. Socio-economic factors play a significant role in our health. This includes where we live, work and play, our income and level of education, the availability of social supports and family structure. Collectively these are known as the social determinants of health. Inequities in these factors, including those related to low income, unemployment, poor working conditions, and social exclusion are linked to such health outcomes as higher hospitalization rates, a higher incidence of disabilities, acute and chronic health conditions and variations in mortality rates.<sup>6</sup> Gaps in health outcomes persist after individual characteristics like biology and behavior are taken into consideration (Marmot, Shipley and Rose, 1984). Living in poor or disadvantaged neighbourhoods is also associated with generally poorer health status and health outcomes (Luo, 2004).

Significant empirical evidence supports this relationship, both internationally and locally.<sup>7</sup> At least 17 national studies of individual-level income data and at least 11 studies of small geographic area-based socio-economic data have found a link between income and health (Auger & Alix, 2009). Comprehensive reviews of hospitalization data in Canada's metropolitan urban areas also confirmed this pattern (CIHI, 2008; CIHI, 2015). Vancouver-specific data show particularly pronounced gaps in hospitalization for Chronic

### Box 2. Social Enterprise -Specific Research, Health Outcomes

#### Causeway Work Centre's social enterprises (Ottawa)

- Individuals reported that they experienced fewer visits to hospital (25% change) since beginning work at the social enterprise (Langford, 2011).

#### Social Enterprise Intervention Pilot, University of Southern California (Los Angeles)

- Individuals participating in the pilot experience a 5.45-unit decrease in depressive symptoms relative to a control group using the Reynolds depression screening inventory (Ferguson, 2013).

#### Twenty social enterprises funded by the Toronto Enterprise Fund

- In pre and post (6 month) interviews, individuals reported a decrease in the use of emergency medical services (34%), an increase in the number who report 'excellent' or 'good' physical health (24%), and a decrease in the number who report a substance abuse problem (40%) (Speer, 2014).

#### SROI Reports, EU EQUAL programme and Communities Scotland (Solstice and Six Mary's Place)

- Reduction in the reported use of mental health services. Value per participant per year: £9,659 Solstice; £21,200 at Six Mary's Place (Durie and Wilson, 2007; Durie, 2007)

#### REDF funded social enterprises (San Francisco Bay area)

- One enterprise is associated with increases in self-reported physical health, but not mental health, or participation in drug counselling (pre and post, control group)
- Decline or no effect for other enterprises (pre and post, no control)

(Rotz et. al. 2015)

<sup>6</sup> Barr, 2009; BC Healthy Living Alliance, 2009; Chief Public Health Officer of Canada, 2008; Public Health Agency of Canada, 2010 cited in: Provincial Health Services Authority, 2011.

<sup>7</sup> For a review of evidence on the social determinants of health from an international perspective see: World Health Organization, "Evidence on Social Determinants of Health" [http://www.who.int/social\\_determinants/themes/en/](http://www.who.int/social_determinants/themes/en/) [accessed December 30, 2015]. A good review from a Canadian perspective can be found in Mikkonen and Raphael (2010)

Obstructive Pulmonary Disease (COPD), conditions related to mental health and to those conditions for which hospitalization, while not completely avoidable, may be preventable.<sup>8</sup> Not only is the personal impact significant, but health inequities are costly for society as a whole, estimated to be \$2.6 billion annually in British Columbia (Health Officers Council of BC, 2008).

Health inequities are particularly acute for specific ethnicities, gender, ages, and disabilities (Provincial Health Services Authority, 2011). Many studies have focused on the health care needs and outcomes of individuals with multiple challenges and need, for instance street-involved youth, the unhoused/marginally housed, and ‘people who use illicit drugs’.<sup>9</sup> A four year study which followed people living in single-room-occupancy hotels in Vancouver’s Downtown Eastside found that people died at eight times the national average (Jones et.al 2015). Adequately accessing services is problematic. For instance, Barker et.al (2015) found that among 1019 street-involved youth in Vancouver, 64 per cent reported having difficulty accessing services. This is also found in the Downtown Eastside more broadly in the community. In a recent community consultation, Vancouver Coastal Health (2014) found that people are not accessing programs as much as they could. Clients reported much confusion about what services are offered and how to access them, and felt there are persistent barriers to continuity of care.

In looking at ways to improve health outcomes, there is growing evidence that community- and systems-level approaches that target the social, economic, and environmental root causes of poor health can be effective at preventing chronic disease and can greatly improve overall health.<sup>10</sup> Social enterprise directly addresses the root causes. In providing employment and economic opportunities in a flexible and supportive way, social enterprises offer not only income, but personal meaning and social connections. Social enterprises also play an important role in directly providing or connecting people to supports to enable them to meet their basic needs - clothing, food, shelter, transportation, childcare – and improve their health, such as onsite medical supports, disability management, psychiatric and psychological counseling, wellness planning, medication administration and management, nutrition and dietary support, extended health plans, smoking cessation courses, and addictions counseling and support.<sup>11</sup> A recent study into the employment support practices with 50 social enterprises, found that most offer “wrap-around” supports that enable people to address barriers outside as well as inside the workplace (Fairholm Mader & Turnbull, 2014).

Social enterprises engage many individuals who are managing and recovering from mental illness. Some specifically have a mandate around this, while others are engaging people in areas that have a high concentration of residents with serious addiction and mental illness, such as people living in the

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<sup>8</sup> For lower-income Vancouverites, hospitalization rates are 2.5 times greater for COPD, 2 times greater for mental health, 2.6 times greater for Ambulatory Care Sensitive Conditions (ACSC), relative to the highest income group. The influence of age is factored out. (See Table 2 in CIHI, 2008).

<sup>9</sup> For Vancouver-specific research, see the Urban Health Research Initiative, <http://uhri.cfenet.ubc.ca/>

<sup>10</sup> Provincial Health Services Authority, (2011). This source references: Bromeling, Watson & Prebtani, 2008; Hayward & Colman, 2003; Health Officers Council of BC, 2008; Pan-Canadian Public Health Network, 2008; Prevention Institute, 2006.

<sup>11</sup> See Fairholm Mader and Turnbull (2014). Many social enterprises are based within a larger social services agency that offers many other types of programs, or are closely associated with other community partners that do.

Downtown Eastside who are homeless or marginally housed.<sup>12</sup> Employment and vocational programs have generally shown to have positive outcomes for people living with mental illness. In addition to positive vocational outcomes, working is associated with reduced psychiatric hospital admissions, reduced healthcare costs, increased quality of life, improved self-esteem, enhanced functioning and an expanded social network.<sup>13</sup>

In measuring impact, it is important to consider that social enterprises are only one part of many efforts in the community to reduce gaps in the social determinants of health. Social enterprises offer both direct and indirect influence on health, both in how employment itself can provide income, social connection and personal meaning, and in how it can serve to connect people with other community supports in housing, education, transportation, justice services, to name a few. Many health outcomes can be influenced over a fairly short horizon. For instance, with intervention, the negative impacts of chronic disease can be reversed quickly, the severity and relapse of mental illness can be reduced, and injuries and new diagnoses can be avoided. Even modest changes in risk factor levels can bring about large improvements in an individual's health (B.C. Office of the Provincial Health Officer, 2010).

As noted in the section 2, the calculator models two specific health related impacts:

- i. Reduction in the use of health care services for individuals living with mental illness.
- ii. Reduction in the use of health services and disability-adjusted life years from reducing health inequities.

i. ***Calculations: Mental Illness- specific***

The first health-related calculation captures the relationship between supported employment and the usage of the health care system by people living with mental illness. The calculation involves the following four steps:

**Step 1. Calculate the average cost of hospitalization per person living with a mental disorder.** The Canadian Institute for Health Information (CIHI) has a patient cost estimator that provides B.C. specific data for average hospital costs per patient by mental disorder and the number of hospital cases in 2012/13.<sup>14</sup> Average patient costs vary between \$4,043 and \$11,760, depending on the mental disorder (see Table 3). A person living with a mental disorder may only occasionally have an episode that requires hospital treatment (sometimes never). In order to calculate the average hospital costs per person living with mental illness (PLMI), we divide total patient costs for each

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<sup>12</sup> For instance, a study of 293 residents living in SROs in Vancouver found that 74% were suffering from a mental illness (Vila-Rodriguez et.al, 2013).

<sup>13</sup> The Individual Placement and Support (IPS) model in particular has been widely investigated through random-control trials and numerous meta-analysis (U.S. Department of Health and Human Services, 2010). There are considerable similarities between IPS and WISE social enterprises, because they both integrate employment with services to support individuals to address the mental health and life challenges that can hinder employment success.

<sup>14</sup> Canadian Institute of Health Information, Patient Cost Estimator [www.cihi.ca/en/spending-and-health-workforce/spending/patient-cost-estimator] Accessed August 6, 2015.

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mental disorder (average costs per patient multiplied by the number of cases), by the total number of persons living with each mental disorder in 2012 in B.C. as reported by Statistics Canada.<sup>15</sup>

*Table 3. Average annual hospitalization costs by mental disorders*

<i>Disorder</i>	<i>Average hospitalization cost 2012 per patient</i>	<i>Average hospitalization cost per person living with this disorder</i>
<i>Schizophrenia or psychosis</i>	\$11,760	\$4,410
<i>Post-traumatic stress disorder</i>	\$8,911	\$1,070
<i>Alcohol abuse or dependence</i>	\$3,767	\$82
<i>Major depressive episode</i>	\$6,780	\$229
<i>Bipolar disorder</i>	\$10,223	\$728
<i>Generalized anxiety disorder</i>	\$5,074	\$40
<i>Eating disorder</i>	\$21,199	\$2,252
<i>Personality Disorder</i>	\$4,043	\$179
<i>Obsessive compulsive disorder</i>	\$11,223	\$84

**Step 2. Calculate the total annual cost of hospitalization for mental disorders for persons living with mental illness (PLMI) who are engaged by social enterprises.** The total annual cost of hospitalization is determined by taking the number of people employed by the social enterprise who are living with each mental disorder and multiplying it by the average annual hospitalization cost of the disorder. The nature of people’s mental disorder diagnosis may not be something that is explicitly tracked by the social enterprise. If not, this could be estimated. To this end, the user can apply distributions that reflect the prevalence of various mental disorders in B.C. as a whole (Column A in Table 4) or distributions that are adjusted to represent the greater prevalence of specific mental health issues in more marginalized populations, such as those who are marginally housed or homeless (Columns B and C in Table 4). Estimates of hospitalization costs per person living with mental illness with each of these distributions are shown in Figure 1.

<sup>15</sup> Statistics Canada, CANSIM, Table 105-1101, Mental Health Profile, Canadian Community Health Survey - Mental Health (CCHS), by age group and sex, Canada and provinces. This was not available for persons diagnosed with Obsessive Compulsive Disorder and Personality Disorder, so these are estimated based on incidence in the population from CMHA Factsheets and population estimates reported by BC Stat. Population Estimate, BC Total, [www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationEstimates.aspx] Accessed July 23, 2015; Canadian Mental Health Association. Fact sheets. [www.cmha.bc.ca/get-informed/mental-health-information] Accessed July 23, 2015. Dementia is excluded from our calculation since this mainly occurs after age 65. We also excluded the following disorders in the calculation because we were not able to match the cost with population data: Miscellaneous Mental Disorder, Mixed Disorder of Conduct/Emotion, Mood [Affective] Disorder, Organic Mental Disorder, Other Mental Health Disorder with Electroconvulsive Therapy. These conditions represent 10% of hospitalization cases.

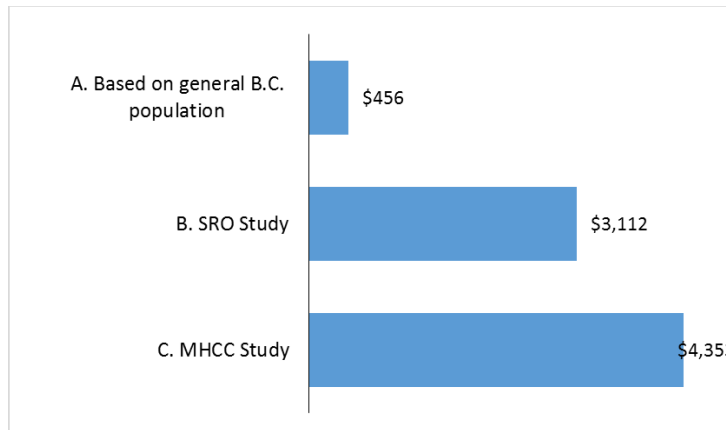
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Table 4. Assumptions about the occurrence of specific mental health issues ('mental disorders') as a share of the total number of people who are living with mental illness

Disorder	A. Based on general B.C. population	Individuals who are homeless or marginally housed.	
		B. SRO Study	C. MHCC Study
Schizophrenia or psychosis	4%	<b>63%</b>	<b>79%</b>
Post-traumatic stress disorder	5%	5%	<b>39%</b>
Any substance use disorder (drug or alcohol)	71%	<b>96%</b>	71%
Major depressive episode	33%	33%	<b>60%</b>
Bipolar disorder	9%	9%	<b>28%</b>
Generalized anxiety disorder	24%	24%	24%
Eating disorder	1%	1%	1%
Personality Disorder	3%	3%	3%
Obsessive compulsive disorder	3%	3%	3%

Sources: A. Based on B.C. population data in Statistics Canada, CANSIM, Table 105-1101. B. The prevalence of specific disorders (in bold) are increased based on a study that followed the health outcomes of 293 residents living in SROs in Vancouver (Vila-Rodriguez, F. et. al., 2013). C. The prevalence of specific disorders (in bold) are increased based on a study that described the health circumstances of 497 homeless individuals in Vancouver (Currie, L., et. al. 2014).

Figure 1. Annual Cost of Hospitalization per Person Living with Mental Illness (using Table 4 incidence assumptions)



**Step 3. Estimate additional inpatient and outpatient service costs (related to mental disorders).**

The CIHI patient cost estimator only reports acute hospitalization costs (inpatient: General Hospital), and does not track other health care system expenses. We estimate these additional costs based on a study by Jacobs et al. (2010) which provides an accounting of all health-care related costs for mental health treatment (Table 5). Ratios that relate acute care hospitalization costs to other inpatient and outpatient services were derived (Table 6) and then applied to the average hospitalization costs derived in step 1. Using this method, additional annual costs for mental health treatment per PLMI are estimated to be: \$146 for other inpatient services, \$802 for outpatient services, and \$305 for emergency room visits (if disorders represent B.C.-wide data), or \$1,393 for

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other inpatient services, \$7,661 for outpatient services, and \$802 for emergency room visits (if disorders represent a homeless population, as per Column C in Table 4). See Figure 2 for a break out of these costs.

*Table 5. Health system expenses in B.C. for mental health*

<i>Type of Cost</i>	<i>Total Direct Cost (\$million) for B.C. in 2007/8</i>
<i>Inpatient: General Hospital</i>	\$249
<i>Inpatient: Psychiatric Hospital</i>	\$54
<i>Long term care</i>	\$25
<i>Physicians</i>	\$205
<i>Outpatient ER rooms</i>	\$17
<i>Community Mental Health</i>	\$234

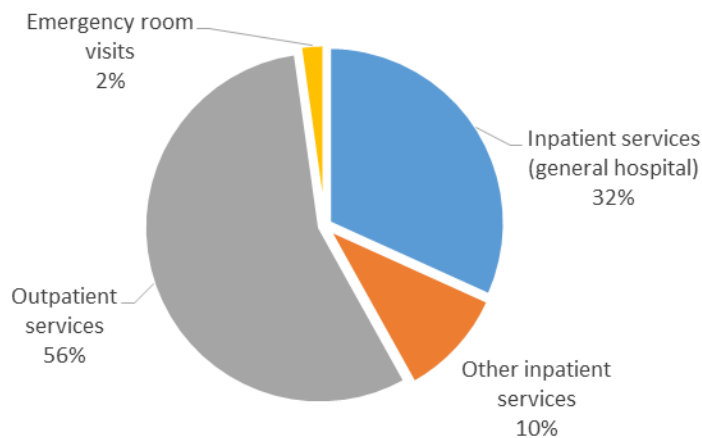
*Source: Jacobs et. al. (2010)*

*Table 6. Multipliers used to estimate additional health system costs (that relate other health system service costs to inpatient costs)*

<i>Health Service</i>	<i>Multiplier* based on Jacobs et al. 2010</i>
<i>Other inpatient services</i>	0.32
<i>Outpatient services</i>	1.76
<i>Emergency room visits</i>	0.07

\*Cost relative to 'inpatient: General Hospital

*Figure 2. Share of health system costs for mental health treatment, by type of cost*



**Step 4. Estimate reductions in health care services based on research.** As noted in the literature review, empirical evidence suggests that supported employment reduces health system costs. This includes costs associated with a reduction in the number of hospital admissions, the length of hospital stays, and the use of outpatient services. We base our parameters on Burns et. al. (2007) and Perkins, Raines & Galka (2005). Rates do vary in the published research that was reviewed, and lower rates can be applied in the calculator and used in sensitivity analysis.<sup>16</sup> Findings reported in Bush et.al. (2009) suggests this range is reasonable.<sup>17</sup>

**Hospitalization**

$$\left( \begin{array}{l} \text{Total annual} \\ \text{inpatient costs} \\ \text{for PLMI} \\ \text{engaged by SE} \end{array} \times \begin{array}{l} \text{Reduction in} \\ \text{admissions} \\ (33\%) \end{array} \right) + \left( \begin{array}{l} \text{Remaining} \\ \text{inpatient costs} \end{array} \times \begin{array}{l} \text{Reduction in length} \\ \text{of hospital stay} \\ (50\%) \end{array} \right)$$

**Outpatient Health Services**

$$\begin{array}{l} \text{Total annual cost} \\ \text{of outpatient} \\ \text{costs for PLMI} \\ \text{engaged by SE} \end{array} \times \begin{array}{l} \text{Reduction in} \\ \text{outpatient services} \\ (33\%) \end{array}$$

**Key Caveats**

This calculation combines published research about the impact of supported employment on health outcomes with B.C.–specific data on treatment costs, the incidence of specific mental disorders, and the number of people who are living with mental illness. It involves a number of assumptions and is illustrative of the magnitude of cost savings. Key caveats to consider in looking at the results include:

- The reduction in the use of health services is based on evidence for community employment support and vocational programs for people living with mental health issues that place participants in workplaces rather than social enterprises. The key difference is that a business and the targeted employment mission are the responsibility of one entity rather than several. Social enterprises that have mandates to specifically employ PLMI are often closely associated with supportive employment programs within mental health agencies.

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<sup>16</sup> See Luciano (2013) for a review of evidence relating to supported employment.

<sup>17</sup> They found reduction in use of institutional use (hospitals and penitentiaries) decrease hospitalization by 67% within 5 years and 28% in the use of outpatient services. This applied to individuals with co-occurring substance use disorder and a long-term psychotic illness.



### *Societal Cost Impact Calculator Method*

- The calculation assumes that the reduction in the demand for health care services is equal to a reduction in health service costs. This oversimplifies how health care is delivered and its associated costs. However for the illustrative purposes of this calculator, this assumption may be reasonable.
- Reductions in health services are based on people living with 'Severe Mental Health Illness'. It is unknown what share of people living with mental illness who are engaged by social enterprises fall into this category, and if the reductions would be different for people living with less severe conditions.
- These cost savings are only calculated for those social enterprises that provide on-going employment using a supported employment model that encompasses continual supports with competitive employment. This is because the literature from which the cost reduction is drawn is based on examining a supported employment model.
- The patient cost per person living with mental illness is not exact. In calculating the baseline costs, the CIHI patient cost calculator covers a fiscal year while the population data covers a standard year.

#### **ii. *Calculations: Health Inequities***

Our calculation method is based on assuming that social enterprises, in tangent with other community interventions, are able to reduce the relative risk for the individuals they employ of developing certain diseases and avoiding death and disability from treatable causes that are associated with low socio-economic status. Cost saving estimates are developed based on assuming that some of the inequities in health status can be addressed. These are developed for:

- I. Valuing reductions in alcohol-related, medically treatable, drug induced and smoking-related death and disability.
- II. Reducing direct health care costs related to:
  - a. New diagnoses of chronic and communicable disease (Human Immunodeficiency Virus (HIV), Hepatitis C, Chronic Obstructive Pulmonary Disease (COPD)).
  - b. Trauma, injury and poisoning and the toxic effects of drugs, the circulatory system and the respiratory system.
  - c. Emergency Department visits.

Detailed calculations are provided for each:

I. Valuing reductions in alcohol-related, medically treatable, drug induced and smoking-related death and disability.

**Step 1. Calculate the potential years of life lost (PYLL) due to treatable causes of death for Vancouver’s inner city that are significantly higher than expected relative to provincial patterns.**

Vancouver Coastal Health publishes the PYLL (potential years of life lost) for preventable diseases in Vancouver’s inner city (represented by Community Health Area 2 (CHA2) shown in Figure 3).<sup>18</sup> They also publish a PYLL Index that relates the observed PYLL in CHA2 to the expected PYLL if the population in CHA2 followed the provincial pattern (factoring out demographic influences). This suggests the magnitude of PYLL that are due to health inequities. We calculate expected rates by applying the index to actual rates.

*Table 7 Estimate of the degree to which potential years of life lost (PYLL) are higher than expected in Community Health Area 2 (CHA2), 5 year period, 2007-11*

<i>Cause of Death</i>	<i>PYLL index</i>	<i>Expected PYLL</i>	<i>Actual PYLL</i>	<i>Difference</i>
<i>Alcohol-related</i>	2.07	2,466	5,105	2,639
<i>Medically treatable</i>	3.47	337	1,168	831
<i>Drug induced</i>	4.92	1,065	5,242	4,177
<i>Smoking attributable</i>	2.27	1,992	4,521	2,529

Source: Vancouver Coastal Health (2013), Table 14.

*Figure 3. Map of Community Health Areas in Vancouver*



Source: Vancouver Coastal Health (2013).

<sup>18</sup> PYLL represents the number of years of life lost when a person dies before they are 75 years old. Vancouver Coastal Health, 2013.

**Step 2. Estimate DALYs and standardize per 1000 population.** In population health, the overall burden of disease is estimated and valued through the use of disability-adjusted life years (DALYs), a time-based measure that combines PYLL with years of life lost due to time lived in states of less than full health, known as years of healthy life lost due to disability (YLDs).<sup>19</sup>

We estimate PYLD based on calculating ratios between Canada-wide data for both YLL and YLD in the Global Burden of Disease Database (World Health Organization, 2015) for the diseases and injuries related to the four causes described in Table 8. These ratios are then applied to the difference between expected and actual rates in PYLL calculated from step 1. PYLD are added to PYLL to calculate DALYs, and are standardized using population data for CHA2.

*Table 8. Estimate of the difference between actual and expected rates in DALYs, CHA2, 5 year period, 2007-11*

<i>Cause of Death</i>	<i>PYLL</i>	<i>PYLD</i>	<i>DALY</i>	<i>Standardized per 1000 Population</i>
<i>Alcohol-related</i>	2,639	554	3,193	44.74
<i>Medically treatable</i>	831	246	1,077	15.09
<i>Drug induced*</i>	4,177	175	4,352	60.98
<i>Smoking attributable</i>	2,529	392	2,921	40.93
<b><i>Total for causes listed above</i></b>	<b>10,176</b>	<b>1,366</b>	<b>11,542</b>	<b>161.75</b>

*\* Drug-induced does not include death associated with conditions related drug use such as Hepatitis B & C, HIV/AIDS as well as unintentional injury and homicide.*

*Source: PYLD and DALY estimated based on data retrieved from the World Health Organization. Global Burden of Disease (GBD) Database. Disease and injury country mortality estimates, 2000–2012. Retrieved August 8, 2015*

**Step 3. Estimate the reductions in DALYs for individuals employed by the social enterprise.** We apply the difference between actual and expected rates of DALYs derived in Step 2, to the population engaged by the social enterprise. We assume that 50% of the DALYs due to health inequities can be reduced through an individual’s engagement in social enterprises in conjunction with improved community support. The reduction is hypothetical, but as noted in the background section, there is strong evidence that supports how the ‘social determinants of health’ influence health status. These determinants include the ability to meet basic needs (nutritious food, shelter, clothing), having a social support network, a healthy physical environment, fair and decent work, and the timely access to health services. Our calculation does not assume that preventable deaths and disabilities are reduced by half, rather it assumes that death and disability rates are only brought more in line with those experienced in other parts of the city.

**Step 4. Monetization of the DALYs.** The inclusion of DALYs in cost-benefit analysis is widespread. This is done by applying a Value of Life Year Gained (VOLY) to the reduction in DALYs. We apply a

<sup>19</sup> World Health Organization, Health Statistics and Information Systems, Global Burden of Disease <[www.who.int/healthinfo/global\\_burden\\_disease/gbd/en/](http://www.who.int/healthinfo/global_burden_disease/gbd/en/)> Accessed October 1, 2015.

VOLY of \$230,199 based on Zhang et. al (2004).<sup>20</sup> This is slightly lower than other rates, for instance the one recommended by the Treasury Board of Canada (2007).

**II a. Reducing direct health care costs related to new diagnoses of chronic and communicable disease**

**Step 1. Calculate reductions in new diagnosis rates of three chronic and communicable disease that are significantly higher in marginalized populations.** We calculate the relative risk between new diagnosis rates for two community health areas: community health area 2 (CHA2) that represents Vancouver’s inner city and a neighbouring region, and CHA 5 ‘Midtown’, which is associated with better socio-economic conditions (Vancouver Coastal Health, 2013). We assume that the risk is lowered 50% for individuals engaged in social enterprises (Table 9). The reduction is hypothetical, but reflects evidence of the importance of social determinants of health in determining health status, and some evidence that show that social enterprises successfully connect hard-to-reach individuals to community services and support individuals in their decisions to move towards healthier lifestyles. This rate assumes that not all health inequities can be addressed and/or that certain conditions may not respond to changes in lifestyle, better access to medical treatment, etc.

*Table 9. Risk of developing following chronic and communicable disease new diagnosis rates per 100,000 (2010/11)*

Disease	CHA2	CHA5	relative risk (CHA2 to CHA5)	Estimate of new diagnoses in CHA2 per year	New diagnoses if health inequities reduced by 50%
COPD*	417.6	264.8	1.58	30	9
HIV	29.6	8.5	3.47	2	0
Hepatitis C	277.4	37.7	7.36	20	1

\*Chronic obstructive pulmonary disease (COPD), age 45 and older  
Source: Vancouver Coastal Health (2013),

**Step 2. Estimate savings in related health costs for population engaged by the social enterprise.**

The reduction in diagnoses is scaled to the population of the social enterprise. An estimate of treatment cost savings is then applied for each diagnosis (Table 10).

*Table 10. Treatment costs (per person, per remaining lifetime)*

Disease	Cost	Source
Hepatitis C	\$65,958	Myers, et. al. 2014
HIV/AIDS	\$273,601	Kingston-Riechers, 2011
COPD	\$42,368	Chapman et. al., 2003

<sup>20</sup> Zhang reviews Value of Statistical Life (VSL) values used nationally and internationally and recommends a rate of \$4.25 million (2003 Cdn). This is annualized assuming a 3% discount rate and 40 years.

II b. Reducing direct health care costs related to: trauma, injury and poisoning and the toxic effects of drugs, the circulatory system and the respiratory system.

**Step 1. Estimate reduction in hospital admission rates related to Trauma, Injury and Poisoning and the Toxic Effects of Drugs, the Circulatory system and the Respiratory System.** According to Vancouver Coastal Health Community Profile data, hospital admission related to ‘Trauma, Injury and Poisoning and the Toxic Effects of Drugs’, ‘the Circulatory system’ and ‘the Respiratory System’ are significantly higher for CHA2 relative to other parts of the city (Vancouver Coastal Health, 2013). We use a similar method to the previous section to calculate the relative risk of hospital admission between community health areas CHA2 and CHA5. Both CHAs have the same proportion of seniors (the demographic that is most likely to influence hospitalization rates). As per the previous two sections, we assume the risk is lowered 50% for individuals engaged in social enterprises. The reduction is hypothetical, but reflects evidence of the importance of ‘the social determinants of health’ in influencing health status. This rate assumes that not all health inequities can be addressed.

Care is taken not to double count hospital costs between Respiratory System related admissions and hospital costs related to COPD calculated in the previous section.

*Table 11. Acute care hospital admissions per 100,000 based on data for 2007/2008*

	CHA2	CHA5	relative risk (CHA2 to CHA5)	Estimate of acute care hospital admission CHA2	If health inequities reduced, assumed reduction in cases CHA2
<i>Trauma, Injury and Poisoning, and the Toxic Effects of Drugs</i>	689	471	1.46	49	17
<i>Circulatory system</i>	718	598	1.20	51	21
<i>Respiratory System</i>	993	496	2.00	71	18

Source: Vancouver Coastal Health, 2014.

**Step 2. Scale this reduction for the population served by the social enterprise and estimate savings in related health costs.** Hospitalization costs are based on patient cost data and volume of cases from CIHI Patient Cost Estimator, BC specific, Adults 18-59 (Canadian Institute of Health Information, 2015). Other direct health care costs are estimated based on ratio of drug and physician costs relative to hospitalization costs in Table 3, EBIC 2005-2008 (Public Health Agency of Canada, 2013).

II c. Reducing direct health care costs associated with Emergency Department visits.

According to VCH Community Profile data, emergency department visits are significantly higher for residents of CHA2 relative to other parts of the city (Vancouver Coastal Health, 2013). We use a similar method to the previous section to calculate the relative use of emergency departments between community health areas CHA2 and CHA5. As per the previous two sections, we assume the risk is lowered 50% for individuals engaged in social enterprises

The emergency department visit cost is derived from Gaetz (2012). He describes usage of the emergency department by individuals who are homeless as 2.1 visits per person, for an annual cost of \$1,464 per person.

***Key Caveats to Calculating Health Inequities***

Unlike the calculation in the previous section that looked at the link between supportive employment and the costs of mental health treatment, there is no solid empirical evidence to draw upon about the impact of social enterprise on individual health outcomes that are valued in this section. While the reduction we assume is hypothetical (and likely conservative), there is some evidence out there that does support a link. For instance a number of social enterprise-specific evaluations in Canada found that employees were experiencing positive health outcomes since beginning work at the social enterprise (see Box 2, page 8). More generally, there is a body of empirical research that connects low socio-economic status to poor health outcomes (and improved socio-economic status with better outcomes), as well as evidence about the role of social determinants of health (that include employment) in determining health status.

Other key caveats to consider in looking at the results include:

- The estimate is likely conservative because we have used data that represents the average in a community health area, rather than individuals who are more marginalized (and more likely to experience poor health) that the social enterprises are typically working with.
- We are using historical data on the rate of diagnoses of chronic diseases, admission to hospital and PYLL. This may not be representative of future data.
- We've assumed all costs are public, though a small portion of total costs are likely to be borne by individuals and/or private insurers (though relatively minor for the marginalized population in question).
- Putting a dollar value on improved length and/or quality of life is highly subjective. The methods used in our calculation follow conventions that are well established in cost-benefit analysis.

## ***B. Crime***

Annually, about 50,000 persons in B.C. are charged with Criminal Code Offences and close to 8,000 persons are charged under the Controlled Drugs and Substances Act.<sup>21</sup> At 65 per 100,000 persons, B.C.'s incarceration rate is the lowest in the country for crimes under provincial jurisdiction (Correctional Services Program, 2015). Poverty has frequently been linked to crime, as people living in poverty are vastly overrepresented in Canada's prison population and are also more likely to be victimized by crime (Ivanova, 2011). Certain populations are over represented in the prison population including young adults (age 18-34), men, and aboriginal adults (Correctional Services Program, 2015). A high proportion of people who use illicit drugs in Vancouver report experiencing incarceration (B.C. Centre for Excellence in HIV/AIDS, 2013).

Involvement in the criminal justice system and employment challenges are intertwined. Nearly half of inmates are unemployed at the time of incarceration (Calverley, 2010). Those with criminal justice involvement face a variety of obstacles to obtaining quality, stable employment (John Howard Society of Ontario, 2009).

The difficulty in obtaining employment is directly linked to the risk of recidivism. Conversely, significant evidence shows that finding a legitimate job and an adequate source of income upon release greatly lowers recidivism. (Visher, 2007, Travis et. al 2001, Johnson and Toch, 1982). For example, one study of men at one year after release from prison found that those who were unemployed had re-offended at a rate of 40% compared to 17% for those who were employed. Notably, ex-prisoners themselves have identified employment as a central factor to their own post release success in several studies (John Howard Society of Ontario, 2009). Social support is important in contributing to employment outcomes for offenders (Gillis and Andrews, 2005).

As noted in the section 2, the calculator models the impact of employment in reducing recidivism – i.e. the relapse of criminal behaviour - and its associated costs. While the impact of employment is important in reducing somebody from turning to crime in the first place, it is more challenging to find evidence about this link to integrate this aspect into the calculator.

### ***i. Calculations: Recidivism***

The calculation involves five steps. The first two steps establish the change in the number of reconvictions due to being employed in a social enterprise, and the remaining steps cost out the benefits of that change including the avoided costs of incarceration, loss of property and the value of reduced pain and suffering due to crime.

**Step 1. Calculate the number of reconvictions that would be likely to occur without employment (BAU).** B.C. Ministry of Justice tracks rates of non-reoffending as a performance measure. It reports a 2-year non-reoffending rate in 2013/14 of 48.7 for custody offences and a 72.2 rate for all offences

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<sup>21</sup> In 2014, 51,676 were charged under the Criminal Code and 7,328 for drug-related offences persons were charged under the CSDA (B.C. Ministry of Justice, 2015).

(custody and community) (B.C. Ministry of Justice, 2015). We adopt the rate of 48.7% to calculate the number of reconvictions that would have occurred ('likely reconvictions') for those individuals who are employed by the social enterprise and who have recently been incarcerated.<sup>22</sup>

**Step 2. Calculate the number of avoided reconvictions due to employment in social enterprise.** We assume that employment reduces the likelihood of re-offence by 30% over 2 years. Evidence to this effect varies and reconviction rates are calculated for different study periods, ranging from 59% in 6 months to 22% over 7 years (Table 12). Our rate is fairly conservative. We multiply the reduction in reconvictions through employment by the number of likely reconvictions determined in Step 1.

*Table 12. The influence of employment on reconviction rates, Canadian-specific research findings*

<i>Source</i>	<i>Findings</i>	<i>Study period</i>
<i>Gillis, Motiuk, &amp; Belcourt (1998)</i>	Offenders who were employed were convicted at less than half the rate of unemployed offenders (17% versus 41%).	six month
<i>Taylor et al. (2008)</i>	2.89 times more likely to be readmitted within one year of release compared to those who were employed.	1 year
<i>Gillis and Nafekh (2005)</i>	At the end of the study period 70% of the employed group remained out of prison, compared to just 55% of the unemployed group.	7 years

**Step 3. Estimate the avoided cost of incarceration.** To calculate this, we first estimate the average number of days that would likely be served for an offence based on the probability of a custodial sentence being imposed for a new conviction and the length of jail sentences imposed by offence (based on data in Table 31 in Easton et.al. (2014), and the distribution of charges by offence in B.C. (B.C. Ministry of Justice, 2013). This is assumed to be 42 days.

We then estimate the share of sentences that would be imposed in a federal prison versus a provincial prison. Federal prison is more expensive to operate. Based on the distribution of sentences (offenders serve in federal prisons for sentences that are greater than 2 years less a day), we estimate that 56% of new offences would be imposed in federal prison.

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<sup>22</sup> Most persons who are going to be reconvicted are reconvicted within three years (Blanden, Hansen & Machin, 2010; Farrington & Davies, 2007). The B.C. rate is similar to other rates in Canada. An inquiry by Statistics Canada found a 44% rate of reconviction in the first year after release; 50% of ex-prisoners were also found to reconvict upon completion of their full sentence, time in prison plus parole (Bonta et.al., 2003).



*Societal Cost Impact Calculator Method*

*Table 13. Daily incarceration cost assumptions and data sources*

	<i>Daily incarceration cost (\$2015)</i>	<i>Source</i>
<i>Average (Federal)</i>	\$332	<i>Department of Public Safety (2014), p.25</i>
<i>Average (Provincial)</i>	\$208	<i>B.C. Ministry of Justice (2013), p.4</i>
<i>Weighted average cost</i>	\$277	

Based on an average sentence of 42 days and an incarceration cost of \$277/day, we assume an avoided cost of \$11,676 per new offence. These costs represent facility operating costs only. In the calculator this is multiplied by the number of offences avoided through employment with the social enterprise.

**Step 4. Estimate the value of avoided loss of property due to reduced level of crime.** This is calculated by relating the reduction in the number of reconvictions to the number of crime incidences, and then multiplying that by the average value of property lost per victim for each type of crime.

Stolen Property:

$$\left( \begin{array}{l} \# \text{ of avoided} \\ \text{convictions} \\ \text{(determined} \\ \text{in Step 1)} \end{array} \right) \times \begin{array}{l} \text{Ratio of} \\ \text{convictions to} \\ \text{incidence of} \\ \text{crime (reported} \\ \text{offences)} \end{array} \times \begin{array}{l} \text{Share of} \\ \text{reported} \\ \text{offences in BC} \\ \text{that involve} \\ \text{property loss} \end{array} \times \begin{array}{l} \text{Average cost of} \\ \text{property loss} \\ \text{per victim} \end{array} \right) +$$

Property Loss during Violent Crime:

$$\left( \begin{array}{l} \# \text{ of avoided} \\ \text{convictions} \\ \text{(determined} \\ \text{in Step 1)} \end{array} \right) \times \begin{array}{l} \text{Ratio of} \\ \text{convictions to} \\ \text{incidence of} \\ \text{crime (reported} \\ \text{offences)} \end{array} \times \begin{array}{l} \text{Share of} \\ \text{reported} \\ \text{offences that} \\ \text{involve} \\ \text{violence} \end{array} \times \begin{array}{l} \text{Average cost of} \\ \text{damage to} \\ \text{property during} \\ \text{violent crime} \\ \text{(per victim)} \end{array} \right)$$

The average property loss per victim is calculated to be \$2112 per person based on the total value of stolen property in Canada in 2009, and the number of people who experience stolen property in the same year (Easton et. al, 2011). From the same source we also calculate the average damage to property during violent crime (per victim) as \$682.10.

## Societal Cost Impact Calculator Method

*Table 14. Assumptions used in calculated the value of avoided loss of property*

<i>Item</i>	<i>Value</i>	<i>Source / Assumptions</i>
<i>Share of reported offences in BC that involve violence</i>	16%	<i>Calculated from crime statistics in B.C. Ministry of Justice, 2015.</i>
<i>Share of reported offences in BC that involve property loss</i>	41%	<i>Calculated from crime statistics in B.C. Ministry of Justice, 2015.</i>
<i>Ratio of convictions to incidence of crime (reported)</i>	10.98	<i>This is based on the ratio of reported offences to estimated convictions based on Table 31 in (2), and data by offence in B.C. (B.C. Ministry of Justice, 2015)</i>
<i>Average property loss per victim of property crime</i>	\$2,088	<i>Calculated based on the total value of stolen property in Canada in 2009, and the number of people who experience stolen property in the same year (Easton et. al, 2014).</i>
<i>Average damage to property during violent crime (per victim)</i>	\$674.56	<i>Easton et. al, 2014.</i>

**Step 5. Value reductions in pain and suffering.** The value of reduced pain and suffering is based on Easton et. al.'s (2014) method of monetizing the intangible cost of pain and suffering. This involves using court-based awards for pain and suffering for Assault 1, and scaling this value according to variations in sentencing by offence. Drug possession, prostitution and administrative offences were not included. Estimates of the nature of convictions is based on B.C. wide data by offence.<sup>23</sup>

$$\begin{array}{ccccccc}
 \text{\# of avoided} & & \text{Estimate of \#} & & \text{Ratio of} & & \text{Average value of} \\
 \text{convictions,} & & \text{convictions, by} & & \text{convictions to} & & \text{pain and suffering} \\
 \text{(determined in} & \times & \text{offence} & & \text{incidence of crime} & \times & \text{per offence (as} \\
 \text{Step 1)} & & & & \text{(reported offences)} & & \text{scaled to Assault 1)}
 \end{array}$$

### **Key Caveats**

Important caveats in interpreting the results include:

- The costs of incarceration, policing and administering justice are influenced by many factors besides the crime rate and sentencing.<sup>24</sup> Reductions in crime will not necessarily translate to lower systems costs in the short term.

<sup>23</sup> Statistics Canada. Police-Reported Criminal Code and Drug Offences in Canada, 2013. Accessed at: <http://www.statcan.gc.ca/pub/85-002-x/2014001/article/14040-eng.htm>

<sup>24</sup> For instance, between 2002 to 2012 the crime rate has fallen by roughly 27% while the cost of dealing with crime by the justice system has risen by 35% (Easton et.al., 2014).

### *Societal Cost Impact Calculator Method*

- In the calculator, we do not incorporate changes in the fear of crime (costs for personal security), private security, and medical costs associated with traumatic crime, loss of productivity for victims of crime, in store retail losses, crime prevention time costs, and probation costs.
- We are only including custody offences (not community offences) because most research focuses on reconviction rates as a measurement of recidivism.
- In calculating avoided property loss, we assume that reduction in reconvictions proportionately reduces the number of offences committed (that are reported). Reported offences underestimate total number of offences committed.
- Incarceration costs are based on adult institutions. They do not take into account youth correctional facilities.
- The cost of incarceration does not include capital costs and only reflect operating costs. If these were included, incarceration costs would be approximately 1.5 greater.
- Reconviction rates and the effects of employment on reconviction reflect adult prison population averages. These would differ by sub-population. For instance, women offenders are reconvicted at much lower rates than men. Aboriginal offenders at a higher rate than non-Aboriginal (Bonta et.al, 2003).

### *C. Economic Impact*

When somebody is not participating in the economy, there are costs borne personally from the loss of earnings over time, and to society as a whole. Conversely, when somebody participates in the economic system, there are both personal and social benefits. Social enterprises provide wages and/or the proceeds of sales as a direct personal financial benefit. Because the work involved is mostly casual, part time, and in entry level roles, the financial benefits are modest. The circumstances and constraints of many people's lives make full-time workforce participation a challenge and individuals work casually or part-time. Some social enterprises such as Megaphone and the Binner's Project offer non-committal labour that builds on the informal economy, while other offer more formal, on-going employment. Individuals who have some form of government income assistance are risk averse to losing this assistance and fear losing other benefits like subsidized housing, childcare and transportation that may accompany income assistance (Fairholm Mader & Turnbull, 2014).<sup>25</sup>

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<sup>25</sup> In B.C. these limits (on average) are 14 hours/week for a 'Persons With Disabilities' (PWD); 9 hours/week for a 'Person With Persistent Multiple Barriers' (PPMB); 3.5 hours/week standard social assistance. Earning limits are \$9600/year PWD, \$500/month PPMB, \$200/year – other.

Nevertheless, even modest gains in income can be very important for people who are marginalized and can contribute to significant gains in well-being and living standards.<sup>26</sup> In addition to providing a source of income, social enterprises typically provide resources that support people to be successful in their work (e.g. uniforms, tool and equipment, meals, bus tickets). They also strive to provide competitive wages and extended benefits that meet or exceed those offered by comparable businesses.

Canadian research suggests that being involved in social enterprises supports individuals to cover their basic needs, save money and reduce their levels of debt. For instance, a longitudinal survey of 187 individuals involved in work integrations social enterprises (WISE) in Toronto found that almost two thirds reported said they had enough to cover their basic needs and that more individuals are able to pay their bills and save money (Speer, 2014). A survey of individuals involved in three social enterprises in Ottawa found that 42% reported an increase in savings, and 33% of employees reported reduced levels of debt. (Langford, 2011) This impact may be more modest in Vancouver, given the higher cost of living here and it would also depend on the nature of the work opportunity.

Job tenure and labour force attachment appear to be very strong for social enterprises that offer on-going employment. For instance, Lanctot, Carbiere and Durand (2012) found job tenure for individuals with psychiatric disabilities to last longer than 2 years on average for a social enterprise in Quebec, while job tenure rarely exceeded one year in competitive employment.<sup>27</sup> Another social enterprise cited in that study found job tenure to be over 6 years on average. The Cleaning Solution, a Vancouver-based social enterprise has found average job tenure to be 4 years.

Social enterprises also have an important role in connecting individuals to other jobs and educational opportunities that can improve their economic prospects. This may be particularly important in working with youth, for example in helping them to complete high-school (or an equivalency). Improved career prospects have a profound long-term impact. For instance by gaining high-school equivalency, an individual will typically gain an additional \$45,579 to \$ 104,222 from age 20 to 54 (Hankivsky, 2008).

By successfully connecting individuals to the work, social enterprises also provide benefits from a 'tax payer' perspective, enabling the government to increase tax revenue, as well as in reducing any government expenditures that may be related to publicly funded supports and health and justice expenditures. From a societal perspective, benefits relate to increasing productivity and changes to health status (if quantified). Taxes and other wealth transfers (like changes in income assistance) would not be included as this is not a 'real' resource cost.

Beyond generating income for individuals who are marginalized, social enterprises produce a greater regional impact associated with its economic activity. This includes:

- direct impact from expenditures related to all labour, materials, supplies and capital;

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<sup>26</sup> Economic research has investigated the role of income and well-being and has found that at low levels of income, there are significant gains to utility (well-being) that comes with the addition of income. This levels off and then declines at higher levels of income (Easterlin, 1974).

<sup>27</sup> A survey of social enterprises (called social firms in the UK) with a similar target employee group found job tenure to also be over 2 years (Gilbert et. al., 2013).

- indirect impact from income and employment generated from the procurement of supplies and services, materials and equipment;
- induced impacts which occur as a result of re-spending on goods and services by those directly employed by the social enterprise.

This is commonly estimated using economic impact multipliers that estimate indirect and induced impacts based on direct impacts.

Independent small businesses, including social enterprise, tend to create greater local economic impacts. This occurs because wholly local companies hire more local labour and buy more goods and services from local suppliers (Pringle, 2013). Research conducted by Civic Economics and CUPE-BC (2013) suggests that local business creates significantly more spin-off effects that double the local economic impact of comparable chain competitors.

### ***i. Calculations: Personal Income and Tax Revenue***

This calculation is fairly straightforward and involves projecting current income, taxes, employment insurance and CPP premiums over time. We do this in two ways: first to estimate earnings over 5 years, and secondly, over an individual's remaining working life. This second estimate is useful for learning about the long-term change in earning potential.

**1. Calculate the work-related income, taxes, EI and CPP over a five year period for the number of individuals who are marginalized engaged by the social enterprise.** This is applied in the five year forecast with no changes - assumes that economic participation / employment at 2014 level is maintained for the five years. If this is expected to differ significantly, it is possible to provide an alternative five year forecast.

If social enterprises do not have aggregate data available specifically on earnings, a tool is provided to help estimate these.

**2. Same as step 1, but calculated over the remaining lifetime of those engaged in the social enterprise.** Cumulative future earnings are calculated as the sum of annual earnings to age 65. 'Future earning multipliers' are applied to personal earnings and taxes to reflect changes in the degree of labour force attachment and additional educational certifications. The educational attainment multipliers are derived based on data on median earning by level of educational attainment for the City of Vancouver from the 2005 Census.<sup>28</sup> The multipliers used are calculated based on the average base hours per employee and assumptions about future educational upgrading and participation in the labour force. An example of these multipliers is shown in Table 15.

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<sup>28</sup> Median(1) 2005 earnings for full-year, full-time earners by education, both sexes, total - age group 25 to 64, for Canada and census subdivisions (municipalities) with 5,000-plus population - 20% sample data. [www12.statcan.ca/census-recensement/2006/dp-pd/hlt/97-563/T803-eng.cfm?Lang=E&T=803&GH=3&GF=0&G5=1&SC=1&RPP=100&SR=601&SO=0&O=A&D1=1] Accessed October 1, 2015.

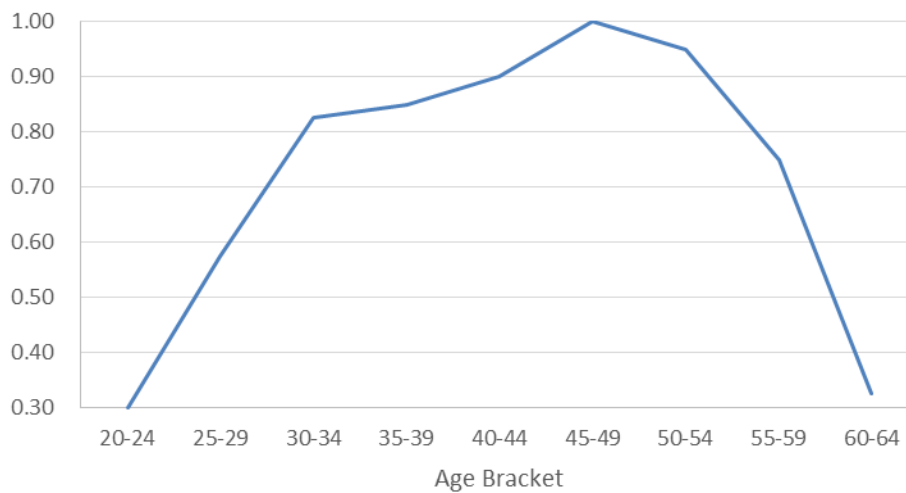
Table 15 Employment earning multipliers assumed in the calculator

	<i>Future Earning Multipliers</i>
<i>Stay at current earnings</i>	1.00
<i>Increase earnings to maximum allowable currently with disability</i>	1.65
<i>Achieve average earnings in Vancouver, (18 hours/wk*) in Vancouver</i>	3.25
<i>Achieve average full-time earnings (41 hours a week) in Vancouver</i>	7.02
<i>Attain additional educational certifications, based on SE input assumptions</i>	1.01

\*This is the average for part-time work in Canada

Earnings are also adjusted according to earning potential by age, based on a profile of income potential relative to maximum by age in Luong and Hébert (2009)

Figure 4 Earning potential over time: ratio of income at a specific age relative to the maximum



**Key Caveats:**

These calculations will not predict actual future earnings and associated taxes/premiums with complete accuracy. Limitations include assumptions that:

- Individual earnings will not fluctuate year over year.
- Individuals stay engaged with the workforce.
- There are no changes to future tax or premium rates.

**ii. Calculations: Changes in supports**

If a social enterprises chooses to track changes in the use of social supports by individuals engaged in the enterprise, this can be incorporated into the calculator. In some case, an individual who is highly marginalized and homeless or at-risk of homelessness may access benefits for the first time, whereas other individuals may access fewer supports as they become more independent and stable. Changes in support costs are incorporated in by multiplying the change in the use of support by the monthly costs of that support. This is calculated over 5 years using the cost assumptions in Table 16.

*Table 16. Monthly cost of supports assumed in the calculator*

Item	Monthly cost	Source
<i>Income assistance</i>	\$610 / \$906	Described in MacLeod (2015) stnd./disab.
<i>Shelter use to assisted (social) housing</i>	\$1,782	Based on Gaetz (2012)
<i>Assisted housing to non assisted</i>	\$205	Based on Gaetz (2012)

**iii. Calculations: Local Economic Impact**

The annual local economic benefit is calculated by multiplying an estimate of social enterprise revenues over five years by a multiplier of 1.49. This includes direct, indirect and induced impacts. This multiplier was developed by Davis (1986) and is specific to Greater Vancouver. For revenues, we use both business sale revenues and grant revenues. While it can be argued that a share of grant revenue would technically be a private or public transfer of wealth within Greater Vancouver (and would not be included in the calculation), there are also strong arguments to include this. For instance, Brent (2004) argues that any transfers that improve mental health can have productivity effects, and thus a real resource effect.

**Key Caveats:**

This calculation provides a rough estimate of local impacts. A few points to consider in interpreting these results:

- The impact will fluctuate year over year depending on social enterprise revenues. Our calculation assumes that revenues stays constant.
- The multiplier is specific to Greater Vancouver. It cannot provide an estimate of impact that is more specific to the City of Vancouver, or inner city neighbourhoods.
- The multiplier was developed in 1986. The structure of the economy used to calculate this multiplier may have changed since then resulting in changes to the multiplier.

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#### **4. Recommendations to Improve the Calculator**

This calculator is purely illustrative in nature. It will help us understand and show how the social enterprises are connected with greater community objectives of social integration and poverty reduction. In building the calculator, we leveraged a wide range of research and modelling, such as recidivism models and economic input-output models. The calculator can be improved in the future by updating parameters with stronger empirical evidence, for instance, from more evidence that is specific to Vancouver as well as parameters that are based on meta-analysis (review of a large body of available evidence to derive parameters). Other ways to build on this work include:

- The calculator produces cost outcomes based on averages. Costs will actually vary for different populations, for instance by gender, age, ethnicity and other factors. In the future, the calculator could be tailored to show results based on unique parameters for these populations.
- Developing calculators for other regions or other employment-related programs.

In order to incorporate these cost estimates into SROI or CBA calculations, additional assumptions are needed. This calculator estimates a variety of public and private costs and does not make any assumptions around attribution and deadweight. The ability to establish the degree to which cost savings can be attributed to the social enterprise varies by outcome. In some calculations – reductions in the use of health services for mental health, and reductions in recidivism - the research that was drawn on to support the model's parameters use quasi-experimental research design methods, which suggests we can infer that cost savings could be attributed to the employment by the social enterprise. In other cases (health inequities), we cannot infer attribution, and we consider that the social enterprise is contributing to reductions along with other community interventions. This perspective coincides with the role that social enterprise have in working with other community services, often serving to navigate the individuals they work with directly to these services.



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## *Societal Cost Impact Calculator Method*

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