

## *A Social Return on Investment Analysis of the Healthy Weights Initiative: 12-month Results for 1,401 Participants*

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### **Abstract**

The Healthy Weights Initiative (HWI) is a free, comprehensive obesity-reduction program within two cities in the province of Saskatchewan, Canada. The objective of the study was to conduct a Social Return On Investment (SROI) analysis on the HWI, which estimates the overall economic, social, and environmental value of an intervention. There are six stages to an SROI: 1) identify stakeholders; 2) map intervention changes including inputs, outputs, and outcomes; 3) give outcomes a financial proxy; 4) account for other factors that can explain the outcome and adjust for drop-off; 5) calculate the SROI; and 6) report the results to a wide population. From June 1, 2015 to January 31, 2018, 2,000 participants completed the initial 24-week HWI program. As of December 31, 2018, 1,401 HWI participants (70.0%) agreed to one-year follow-up and the SROI survey. The survey was also completed by 121 of 132 referring physicians (91.7%). Overall, 99.9% of HWI participants believed the observed outcomes were acceptable, 7.1% believed the results were possibly due to another program in the city, 99.8% felt the program was worth the cost, 71.3% indicated they would be willing to pay for such a program themselves, and 99% believed some level of government should finance the program. Among referring physicians, 98.3% believed the observed outcomes were acceptable, 10.7% believed the results were possibly due to another program in the city, 96.7% felt the program was worth the cost, 53.7% indicated they would be willing to pay for such a program themselves, and 82.6% believed some level of government should finance the program. With a value of \$2,984,916 Canadian dollars, and a total program cost of \$1,000,314 Canadian dollars, the one-year SROI was 2.99. For every \$1.00 Canadian dollar invested in the HWI, a social return of investment of \$2.99 Canadian dollars was obtained.

### **Objective**

The Healthy Weights Initiative (HWI) is a free, comprehensive obesity reduction program in the cities of Regina and Moose Jaw in the province of Saskatchewan, Canada [1].

To date, four peer-review publications have documented the clinical outcomes of the HWI with a focus on changes in health and behavioural outcomes like weight, body fat percentage, waist-to-hip ratio, blood pressure, blood cholesterol, blood sugar, self-report health, depressed mood, self-report mental health, quality of life, aerobic fitness, dietary behaviour and health care utilization [1-4].

There are examples of the financial impact of obesity and chronic disease on society. One analysis looked at the cost of obesity to the National Health Service in England and determined direct health care costs to be £3,379 per person per year [5]. A second analysis from Scotland looked at the indirect costs of obesity and concluded the impact to be £1,443 per adult per year [6]. A meta analysis also quantified the financial impact of obesity related chronic diseases including the value of diabetes (59% of an individual's income), heart disease (up to £93,532), orthopedic problems (£7,000), high blood pressure (£8,000) and overall poor health (£300,000) [7]. However, the

outcome with the greatest financial impact on society is depression or anxiety with a monetary value of £44,237 per year [8]. This cost is independent and statistically controls for other health concerns.

There are also economic return on investment (EROI) analyses. A number of studies have been published on employer-led obesity reduction programs. One literature review found that workplace obesity prevention and reduction programs had an EROI of \$3.27 U.S. dollars in medical care cost savings for every dollar invested and \$2.73 in absenteeism cost savings for every dollar invested [9]. Similarly, a study of employee wellness programs found an EROI of \$2.03 for every U.S. dollar invested [10]. However, a limitation of EROI is that they do not include consultations with those actually impacted by the intervention, let alone broad consultation with community stakeholders [11]. This is where SROI can be of benefit. An SROI is an evaluation that estimates the overall economic, social, and environmental value of an intervention – and not just the clinical impact.

Although SROI are becoming common in England, they are not common in North America yet. In a systematic literature review of 40 accepted studies on the SROI of public health interventions, only three were from North America [12]. This

systematic literature review (which included two exercise and two dietary programs) found that for every \$1.00 U.S., the median return on investment was \$14.30 [11]. In another comprehensive review of SROI and wellness initiatives, a single quality adjusted life year due to 30 minutes of new physical activity alone per week has been valued at £231 per year, the benefits of dietary change have been valued at £225 per year, and reduced health care costs to treat depression have been valued at £2,026 per year per beneficiary [12].

The objective of the current study was to conduct a comprehensive and long-term (12-month follow-up) SROI analysis on the HWI in Saskatchewan, Canada. The assumption was that if participants completed the HWI, and there was increased physical activity, dietary change and a lowering in the prevalence of depressed mood, that these health and behavioural changes would result in a social benefit.

## Methods

There are seven principles of SROI: a) involve stakeholders, b) understand and articulate the changes or outcomes, c) value what matters to stakeholders in financial terms, d) only include what is documented, e) do not overclaim the impact of the intervention, f) be transparent and g) verify the result [12].

There are six stages to an SROI: 1) identify stakeholders including participants, staff, partners and the community; 2) map intervention changes including inputs (i.e., cost of staff and facility), outputs (i.e., number of participants and number of completions) and outcomes (i.e., change in physical activity, dietary behaviour, health outcomes and mental health outcomes); 3) give outcomes a financial or monetary proxy (i.e., the value of increased physical activity rates); 4) establish overall impact which includes accounting for other factors that can potentially explain the outcome (i.e., the outcome would have occurred regardless of the intervention or due to another intervention – sometimes called deadweight) and adjust for drop-off (i.e., ability to sustain outcomes into the future – sometimes called discounting); 5) calculate the SROI (i.e., value less deadweight and drop-off); and 6) report the results in a way that is readable and accessible to a wide population [12].

Although one reference has been provided in detail to discuss principles and stages of SROI [12], these procedures are similar to other approaches [11,13].

An example of the statistical calculations for SROI of behavioural change is as follows [12]. A wellness program with physical activity and dietary advice also had the benefit of mental health improvement. The author concluded that improvements in physical activity (55 participants by 2.5 hours of new activity per week for 52 weeks multiplied by £4.45) resulted in a value of £31,818 in quality adjusted life years. With half of the participants changing their dietary behaviour as well (half of 55 participants, or 27.5 participants, multiplied by £225 per year), the value was £6,188. With 30% of the participants no longer having depressed mood as a result of the intervention, the value was £33,429 (30% of 55 or 16.5 participants multiplied by £2,026 in reduced health care costs per year). With 10% aggravating injuries (10% of 55 participants or 5.5 multiplied by £69 cost for treatment), there was a loss of value of £380 for physical therapy treatment. As such, the total value in one year was £71,055. Attributing 25% of the outcomes to other interventions (deadweight), the corresponding value was £53,291. In the following year, only 50% of the outcomes were maintained so the value is discounted to £26,645. In the third year, the deadweight and discounted value was £15,938. Therefore, the total value was £95,874 (£53,291 plus £26,645 plus £15,938). With a cost of programming of £82,000, the SROI was determined to be 1.17. In other words, for every one English pound spent, there is a social return on investment of £1.17 [12].

The methodology of the HWI has been described in peer reviewed papers previously [1-4]. The HWI is a comprehensive obesity reduction program at no charge to participants. The initial 12 weeks includes 60 supervised group exercise therapy sessions, 12 group dietary education sessions and 12 group cognitive behavior therapy education sessions. The second 12-week session is for maintenance and includes one supervised exercise session every week for 12 weeks. The program also includes social support with a 'buddy' who attends all sessions and a social support contract with three family members or friends. The methodology to collect valid and reliable physical health, mental health and quality of life outcomes has also been described previously [1-4]. In brief summary, blood pressure, blood cholesterol and blood sugar levels were taken by the local health region, the fitness test format followed the Modified Canadian Aerobic Fitness Test, physical measurements adhered to methodology from the Canadian Society for Exercise Physiology, depressed mood was measured with the Beck Depression Inventory II (BDI-II), health related quality of life was evaluated with the SF-36 and general health outcomes were determined with questions from Statistics Canada's annual Canadian Community Health Survey [1-4].

In order to complete an SROI, all family physicians, cardiologists, internists and medical health officers that referred to the program, and former HWI participants themselves, were asked to complete a questionnaire valuing the HWI program. All community stakeholders were given a written summary of the results (adherence, physical health, mental health, and quality of life outcomes) and the cost for the program per participant (\$714 per person – although given at no charge to participants). The stakeholders were then asked if the observed changes were acceptable, if the changes were possibly due to another program offered in the city, if the program was worth the cost, if they would personally pay for such a program, and whether or not government should pay for the program. The survey ended with a request to add any positive or negative observations of the HWI program.

All survey participants provided written informed consent for the SROI evaluation. Ethics approval was obtained by the University of Liverpool Ethics Committee (L.O.R.E.C.).

## Results

From June 1, 2015 to January 31, 2018, 2,000 participants completed the initial 24-week HWI program. As of December 21, 2018, 1,401 HWI participants (61.0%) agreed to one-year follow-up and the SROI survey. The demographic data is presented in Table 1. The physical activity, dietary, physical health, mental health, depressed mood, and quality of life results from baseline to completion, and then one-year follow-up for 1,401 HWI participants who also agreed to complete the SROI survey.

## Conclusion

As mentioned previously, there are six stages to an SROI. In our study, a broad array of stakeholders was identified before, during, and after the program including family doctors, cardiologists, internists, medical health officers, politicians, community leaders, staff members, and former participants. Second, inputs, outputs, and outcomes were obtained and evaluated. Inputs included determining the total cost of the program (\$714 per participant), while outputs included determining that there were 1,401 who completed the one-year follow-up and SROI survey. Outcomes included a wide variety of measures including changes in physical activity, dietary behavior, physical health, mental health, and quality of life. Third, financial proxies were given to physical activity, dietary and mental health changes based on the results of another publication. Fourth, the analysis adjusted for other factors including deadweight (outcome would have occurred regardless

of the intervention or due to another intervention – 25% as determined by referring physicians) and dropoff (i.e., ability to sustain outcomes into the future – 31% drop-off in depressed mood). Fifth, the SROI was calculated. Sixth, the clinical results were widely disseminated to the local community for stakeholders to help calculate the SROI.

The seven principles of SROI were also adhered to. Stakeholders were involved before, during, and after the program to ensure broad community consultation and transparency. Each stakeholder was given a copy of the final results upon program completion prior to valuing the program. Perhaps unique to SROI, referring physicians and former participants were then asked to value the program with a survey.

In regards to the principle of not over-claiming the impact of the intervention, very conservative estimates were used. For example, one study found the total financial impact on society of depression to have a monetary value of £44,237 per year [8]. The current analysis used a much more conservative estimate of £2,026 per year per beneficiary in reduced health care costs to treat depression. Similarly, in order to be conservative, and to not over-claim the estimate, this analysis does not suggest that complex chronic diseases like cardiovascular disease or diabetes were prevented. Lastly, in order to be conservative, a discounting rate of 25% was applied to this analysis – instead of an average of 3.5% discounting applied to papers in a systematic literature review on SROI.

There are a number of benefits to the current analysis. First, actual values (primary data) were used to determine outcomes instead of publicly available data (secondary data). Second, actual values were used to determine discounting for drop-off and expert physician opinion was used to determine deadweight instead of using a standard value. In order to address the limitation of EROI, this SROI included a wide consultation with former participants and referring physicians. In a systematic literature review on SROI of public health interventions, only 23% of studies interviewed a range of stakeholders from participants to promoters to implementers. Perhaps most importantly, this appears to be the first SROI on population-based obesity reduction program. In a 2015 systematic literature review on SROI of public health interventions, the authors only found two evaluations of community-based walking programs and two evaluations of community-based meal provision to seniors. No studies were documented on population-based obesity reduction.

There are also a number of limitations to the current analysis. Most importantly, the study is not a randomized controlled trial and does not include a control group. As such, only associations can be determined and not causation.

In the end, the study found that with a social value of \$2,984,916 Canadian dollars, and a cost of \$1,000,314 Canadian dollars, the Social Return on Investment was 2.99. This conclusion is consistent with other similar, but not identical, studies. For example, one literature review found that workplace obesity prevention and reduction programs had a financial return of \$3.27 American dollars in medical care cost savings for every dollar invested and \$2.73 in absenteeism cost savings for every dollar invested.

The Healthy Weights Initiative is a comprehensive obesity-reduction program conducted in Saskatchewan, Canada at no cost to participants. It appears that the program had social benefit, social value and that the costs were justified. For every \$1 Canadian dollar invested, a conservative social return of investment of \$5.06 Canadian dollars was obtained.

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