



# Take a Hike Foundation

Social return on investment report



*Image provided by: Take a Hike Foundation*

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We are providing no opinion, attestation or other form of assurance with respect to our work and we did not verify or audit any information provided to us.

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# Executive summary

Take a Hike partners with public school districts to engage vulnerable youth in a full-time mental health and physical and emotional well-being program that is embedded in an alternate education classroom. Take a Hike engages youth in intensive and continuous clinical counselling, adventure, and community. The public school districts engage youth in high quality education. Taken together these activities mean the youth are empowered to change the trajectory of their lives. Over the last 18 years, Take a Hike has been seeking to **understand the impact that the program has on the youth involved and society** more broadly.

In 2019, Take a Hike engaged PwC ('we/us/our') to estimate the social impact arising from an average youth who takes part in the Take a Hike program and to value this impact in monetary terms. Specifically, **the study estimates the social return on investment (SROI)** generated by the program by comparing the financial costs of the program to the monetary value of the impacts it creates. To implement the SROI we applied PwC's Total Impact Measurement & Management (TIMM) framework, which uses economic valuation techniques to measure and value the impacts of an organisation's activities.

The impacts chosen to be included within the scope of this study were:

1. Increased future earnings for the individual due to **improved graduation rates**
2. **Improved mental well-being** of individual leading to
  - a. reduced reliance on medical support services
  - b. reduced problematic substance use
  - c. reduced homelessness
  - d. reduced crime
3. **Improved physical well-being** of individuals, leading to reduced reliance on medical support services

It was not possible to quantify and value all the potential impacts that Take a Hike creates. If more impacts had been included in the study then the SROI value would likely have been higher. We used two approaches to collect Take a Hike specific data for our analysis: a) Graduation rate data from The B.C. Ministry of Education ('the Ministry'), and b) A Take a Hike alumni survey (for which 38 complete responses were received).

Subject to our methodology, a range of assumptions we made for the purposes of this study, and our limitations as noted in this report, we estimate that for every \$1 spent on the Take a Hike program, **between \$5.60 and \$13.40 in social value is generated through Take a Hike.**

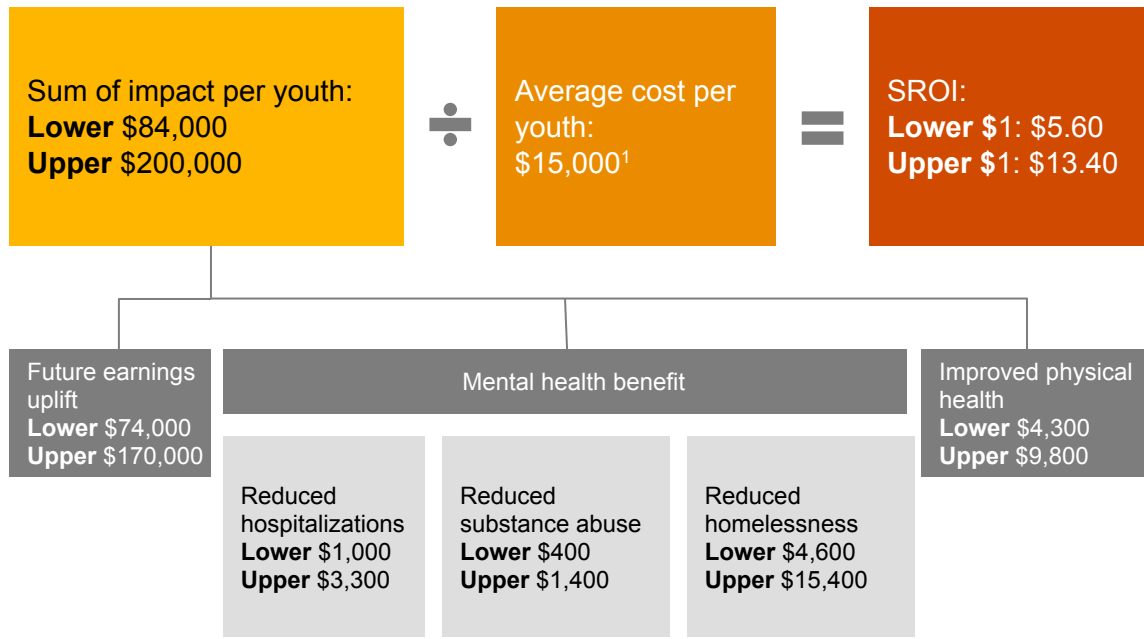
While the estimation of the social value of the Take a Hike program is based on established economic valuation techniques and the best data available at the time of the study, there were a number of uncertainties in the calculation including: the extent to which impacts are attributable to the Take a Hike program and what might have happened in its absence. In addition, it is not certain that the alumni survey results are reflective of the average impact experienced by the youths. To address these and other uncertainties, the results are presented as a range spanning between what we believe reflect reasonable lower and upper bound assumptions. For further information on these assumptions see the 'Our SROI Approach' section and Appendix 4 for a Sensitivity Analysis.



Image provided by: Take a Hike Foundation

# Executive summary

## SROI results



Our analysis found that the largest impact of the Take a Hike program is in helping students graduate with their Dogwood diploma meaning they will likely have increased future earnings over their lifetime. However in the upper bound estimate, even without including education uplift impacts, the total impact per student of just the mental and physical health improvements is \$29,900, giving an SROI of 1: 2.0. This suggests that, beyond supporting educational outcomes, Take a Hike is delivering significant value to society through the focus on mental well-being and physical activity.

Our sensitivity analysis found that the SROI of the program is highly sensitive to the increase in student graduation rate that can be attributed to Take a Hike. Future SROI analysis would benefit from a larger data set from which to estimate graduation likelihoods and over different time periods. For example, the education uplift analysis conducted with the Ministry of Education only looked at six year completion rates, however many Take a Hike students complete after seven or more years, where they may not have graduated at all without the support of Take a Hike.

Another key variable in the SROI analysis is the cost of the program per youth. Data from Take a Hike shows that 25% of the cost of sending a youth to Take a Hike is due to fundraising activities. If the cost per youth were to reduce by 25%, for example if the government were to fund the program in its entirety and supplant the need for the fundraising spend, **the SROI estimate would increase to between \$7.50 to \$17.80.**

<sup>1</sup> Average length for youth participation in the program is 18 months, with an average annual cost of \$10,000. Therefore the cost per youth for participation in the program is estimated to be \$15,000. This will vary based on classroom size and expansion costs of the program.

# Introduction

## Background to Take a Hike

Take a Hike partners with public school districts to engage vulnerable youth in a full-time mental health and physical and emotional well-being program that is embedded in an alternate education classroom. Take a Hike engages youth in intensive and continuous clinical counselling, adventure, and community. The public school districts engage youth in high quality education. Taken together these activities mean the youth are empowered to change the trajectory of their lives. Over the last 18 years, Take a Hike has been seeking to understand the impact that the program has on the youth involved and society more broadly.

## Why this project?

Take a Hike have engaged with PwC to complete a Social Return on Investment (SROI). The objective for this project is to understand and quantify the long-term impacts that Take a Hike programs provide to vulnerable youth and communities.

## What is an SROI?

SROI, or Social Return on Investment, is a method for measuring the monetary value of social and environmental impacts that are not well-represented in conventional reporting. This method is able to show the cost associated with running a program or activity against the benefits derived by society (in the form of a ratio), see Figure 1. Official guidance for undertaking SROI was first produced in 2009 by the UK Cabinet Office, and since has been updated by Social Value International in 2012<sup>3</sup>.

This study uses the SROI guidance as well as a variety of internationally recognized protocols and methodologies for social impact measurement, many of which PwC helped to develop. These include the Social and Human Capital Protocol<sup>4</sup>, released by the World Business Council for Sustainable Development (WBCSD), and the Impact Management Project's five dimensions of impact<sup>5</sup>. Figure 2 below shows the five dimensions of impact and the types of questions asked in the SROI assessment to address each dimension.

Figure 1. How social return on investment be used to compare social value creation relative to costs

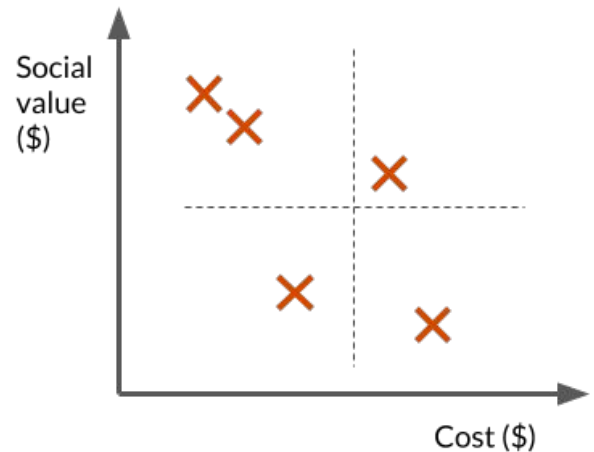


Figure 2. Five dimensions of impact



### 1 | What?

What are the impacts created by Take a Hike and how do they benefit society in the long-term?



### 2 | How much?

How much of a change has been created? What is the depth of impact to the beneficiary and to society?



### 3 | Who?

Who experiences the impact? How are different geographies of youth affected differently?



### 4 | Contribution

To what extent can the impacts felt by the youth be attributed to Take a Hike programs versus external factors?



### 5 | Risk

Are there risks involved that may affect the creation of impact? Are there any unintended negative consequences?

<sup>2</sup> <https://www.takeahikefoundation.org/>

<sup>3</sup> <https://socialvalueint.org/social-value/>

<sup>4</sup> <http://social-human-capital.org/>

<sup>5</sup> <https://impactmanagementproject.com/>

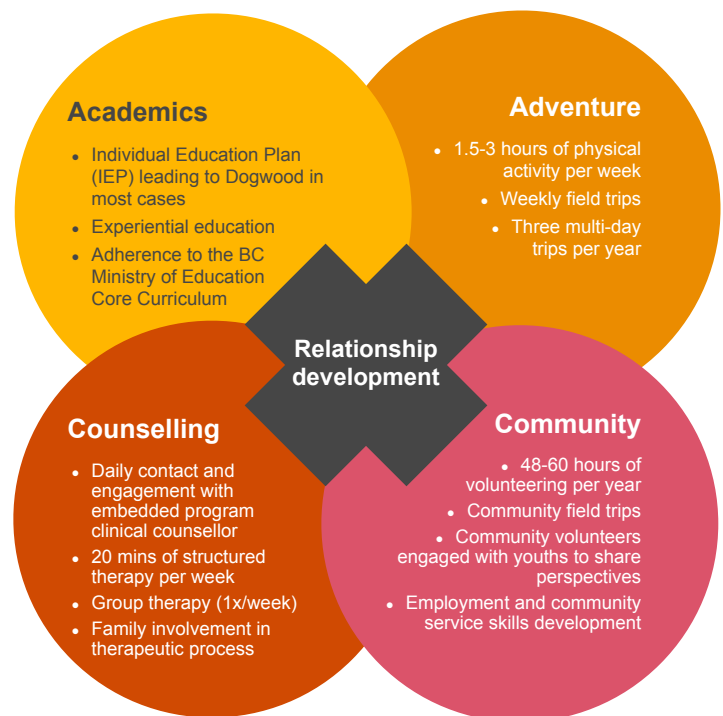


# How Take a Hike creates impact

A logic model, also known as a Theory of Change, is a representation of how an organisation's activities create change. The activities from Take a Hike's logic model are shown in Figure 3. Nine broad societal impacts are hypothesized to result from these activities.

A materiality analysis was performed by Take a Hike experts (including Take a Hike staff, counsellors, teachers, and academics) to identify those impacts that are considered to be the most significant (in terms of magnitude of impact) and most relevant (the importance of the impact to the youth and society). The most material impacts were chosen to be included in the data collection and SROI calculation and the less material impacts are considered out of scope for the purposes of this study.

Figure 3. Take a Hike activities



## Most material impacts (to be included in this study):

1. Increased future earnings for the individual due to improved graduation rates
2. Improved mental well-being of individual leading to
  - a. reduced reliance on medical support services
  - b. reduced problematic substance use
  - c. reduced homelessness
  - d. reduced crime
3. Improved physical well-being of individuals, leading to reduced reliance on medical support services

## Less material Impacts (out of scope for this study):

4. Improved well-being and mental health of family
5. Increased likelihood of family members graduating (spillover effect)
6. Reduced reliance on food banks
7. Increased charitable giving/ volunteering
8. Increased participation in civil activities
9. Increased engagement with conservation or environmental activities



Image provided by: Take a Hike Foundation

# Our SROI approach

We used two approaches to collect Take a Hike specific data for our analysis.

- 1) The B.C. Ministry of Education ('the Ministry') has access to graduation rate data for all students (Take a Hike and non Take a Hike) in the school districts in which Take a Hike operates. These data were used to compare six-year completion rates (rates of graduation with a Dogwood Diploma<sup>6</sup> within six years) for students that went through Take a Hike and those who did not. In conducting this comparison the Ministry selected a sample to control for the socioeconomic background of the youths.
- 2) Take a Hike ran a survey with alumni to understand what has happened to youths once they leave Take a Hike. The survey was sent to approximately 100 alumni and 38 complete responses were received. (See Appendix 2 for information on the demographic of the respondents).

We then estimated the social value generated by the Take a Hike program across each material impact area. Our approach followed the principles of SROI, an important part of which is 'establishing impact' by accounting for factors such as attribution, deadweight, displacement, and drop-off. The following sections details how each of these were addressed:

## Deadweight

Deadweight accounts for the extent to which the individual would have experienced an outcome anyway in the absence of the Take a Hike program. A baseline is needed as the starting point against which changes resulting from the Take a Hike program can be measured and deadweight calculated. Where possible, external data were used to understand the likelihood of an individual of a similar demographic profile to Take a Hike participants experiencing a certain factor. For example, what the likelihood is of any individual with a mental health diagnosis also having a concurrent substance abuse issue. Where no appropriate external data were available, we have used the survey responses from 'Before Take a Hike' as the baseline.

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<sup>6</sup> In BC, a Dogwood Certificate is awarded to students who graduate from a Grade 12 graduation program or an adult graduation program.



## Attribution

Attribution is the degree to which the calculated change can be said to be caused by the activities of Take a Hike, as opposed to other parties or factors. To understand the extent to which student graduation rates could be attributed to participation in Take a Hike, the Ministry conducted a regression analysis. The regression analysis was designed to control for other socioeconomic variables when evaluating the contribution of participation in the activities of Take a Hike (see Appendix 1).

To assess attribution for the other identified material impact areas we used results of the alumni survey where respondents had been asked to compare their attitudes before and after participating in Take a Hike activities. The average score of a set of specific 'before and after' questions was used to estimate the degree of impact that could be attributed to the Take a Hike program as opposed to other external influences. For more information on how attribution was calculated and the limitations of this assumption please see Appendix 3.

## Displacement

Displacement considers if there is a situation where a program might reduce a negative outcome in a certain location or for a certain demographic, but that outcome has actually been displaced to somewhere else and so has not been eliminated from society. In Take a Hike's logic model, the majority of areas had no significant displacement. For example, we assumed that participation in the Take a Hike program did not cause a negative impact on other non-Take a Hike youths. Furthermore, for the employment impact we assume that the job gained by a Dogwood graduate does not prevent another individual obtaining a job, although this magnitude of this effect could be estimated in future<sup>7</sup>.

## Duration and drop-off

Duration and drop-off accounts for the probability that the impact of an activity will only have a certain overall duration, and that initial impact experienced may decrease over time. For alumni survey participants, the average number of years since leaving the Take a Hike program was 7, and the maximum was 15 years. We have assumed for the purposes of this study that impacts last for 7 years after the program in all instances, except for the impact of graduation likelihood on a student's future earnings. We modelled future earnings impacts out to the Canadian retirement age of 65 because there is strong evidence in the literature that this effect persists for the rest of an individual's career<sup>8</sup>.

## Discounting and inflating values

For the areas where impacts were projected for future years a social discount rate was applied to earnings in future years to obtain the present value. A real discount rate of 3% was used, as recommended by the Treasury Board of Canada<sup>9</sup>. When using values from academic literature and databases, we endeavoured to use the latest year of available data, and where necessary we updated values to 2019 prices using Statistics Canada inflation<sup>10</sup> and productivity data.

## Double counting

As many of the impacts of Take a Hike are interrelated, there is a potential for double-counting values when it comes to estimating the return on investment. Where these crossovers were not possible to separate out we have not included the impact. For example, the cost of crime was initially identified as a material impact, but was found to be too difficult to calculate as distinct from the costs of homelessness and substance abuse as both the societal costs estimates for these included police and judicial costs. Therefore the social cost of crime has not been calculated separately.

<sup>7</sup> This can be estimated using supply side substitution effect estimates such as: <https://www.gov.uk/government/publications/the-dwp-social-cost-benefit-analysis-framework-wp86>

<sup>8</sup> OECD human capital approach: <http://www.oecd.org/innovation/research/1825143.pdf>

<sup>9</sup> Canadian Cost-Benefit Analysis Guide <https://www.tbs-sct.gc.ca/rtrap-parfa/analys/analys-eng.pdf>

<sup>10</sup> When inflating goods and services estimates, the Bank of Canada Inflation Calculator was used, this is based on Statistics Canada Consumer Price Index.

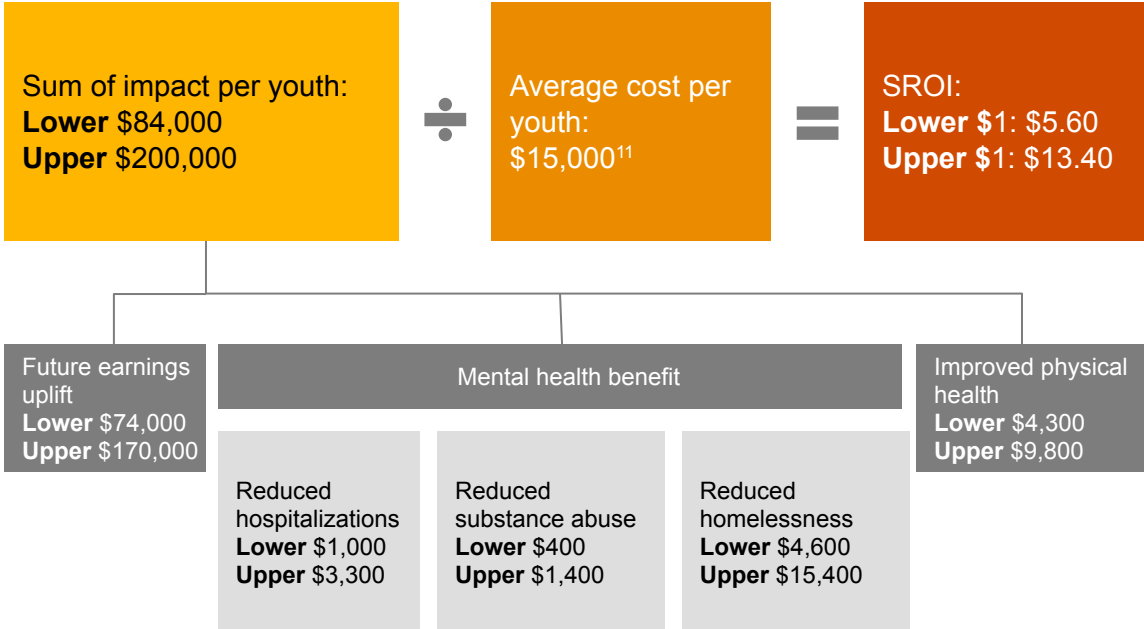


# Results

Image provided by: Take a Hike Foundation

Based on the approach described above, a range of assumptions we made for the purposes of this study, and limitations noted in this report, we estimate that for every \$1 spent on the Take a Hike program a social return on investment of between **\$5.60 and \$13.40** is created. To calculate this ratio we sum the estimated monetary value of the social benefits that will occur over the lifetime of a single youth (discounted back to net present value), this is then divided by the average cost of putting a youth through the Take a Hike program (see Figure 4 below).

Figure 4. The SROI calculation



A more detailed explanation of how this social value breaks down across the different impact areas is provided in the following pages.

<sup>11</sup> The average annual cost of the program for each youth was reported by Take a Hike to be \$10,000. We assumed youth participate in the Take a Hike program an average of 18 months based on the participation rates for the cohort of youths used in the sample for the Ministry of Education analysis. The average cost per youth for participation in the program was therefore estimated to be \$15,000. This is an average and will vary based on classroom size and expansion costs of the program.

## 1. The social return of increased future earnings for the individual due to improved graduation rates

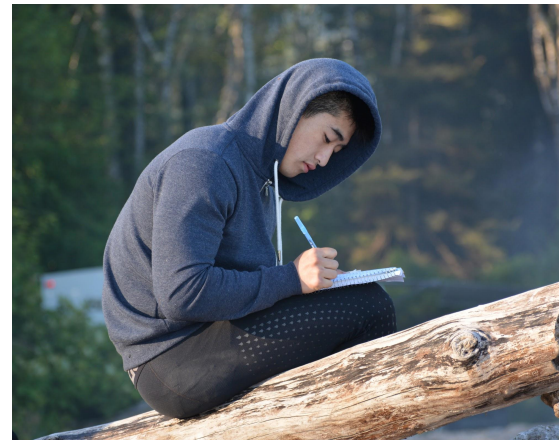
This impact area focuses on how Take a Hike supports youths in attaining a Dogwood Diploma. Research has shown that a higher graduation rate leads to higher earnings and a higher workforce participation rate. The link between graduation rates and the likelihood and scale of increased earnings in the future was measured in a 2016 Statistics Canada study<sup>12</sup>.

From their internal data, Take a Hike reports on average that 90% of their grade 12 students have graduated over the last 5 cohorts (this includes students who take six, seven or greater years to complete their Dogwood Diploma)<sup>13</sup>. However, for our analysis, it is important to understand how many of those students may have graduated regardless of whether they had attended Take a Hike.

The B.C. Ministry of Education has been working with Take a Hike to collect data to help understand the results of the Take a Hike program. The Ministry analysed recent data for school districts in which Take a Hike operates (see Appendix 1 for a description of the analysis and limitations of the data). The analysis focused on whether students completed their Dogwood Diploma within six years. Limiting the analysis to only six-year completion rates excludes those students who complete their diploma in seven or eight years, however these were the best available data at the time of our study.

There are many factors that influence whether a student completes their Dogwood diploma within the six year window, these include characteristics of the student (e.g. learners with complex needs (complex behavioural or mental health concerns), English language learner<sup>14</sup>, nationality, gender) and external factors influencing the student (e.g. household location, household income, support of parents, support of family). The sheer number of potential factors, some of which we can obtain data on and some of which we cannot, makes any analysis of attribution towards graduation rate complex. An effective analysis of these types of factors requires a large sample size, but in practice this is not often available, therefore any results estimated in the below analysis are subject to significant uncertainty and limitations. In this study the Ministry's data sample included 235 youths who have been in Take a Hike (treatment group) and 345 who had not participated in Take a Hike but were matched (as far as possible) with the demographic of the Take a Hike student population to be a control group.

The analysis found that students attending Take a Hike had, on average, a 9% (percentage point) increase in likelihood of graduating in six years compared to a scenario in which they did not attend Take a Hike i.e. the model uses a binary variable of either a youth attends Take a Hike or does not. This value was used as the lower bound estimate of Take a Hike's attribution for the total societal impact of a student graduating within six years.



*Images provided by: Take a Hike Foundation*

<sup>12</sup> <https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016024/98-200-x2016024-eng.cfm>

<sup>13</sup> Take a Hike internal data

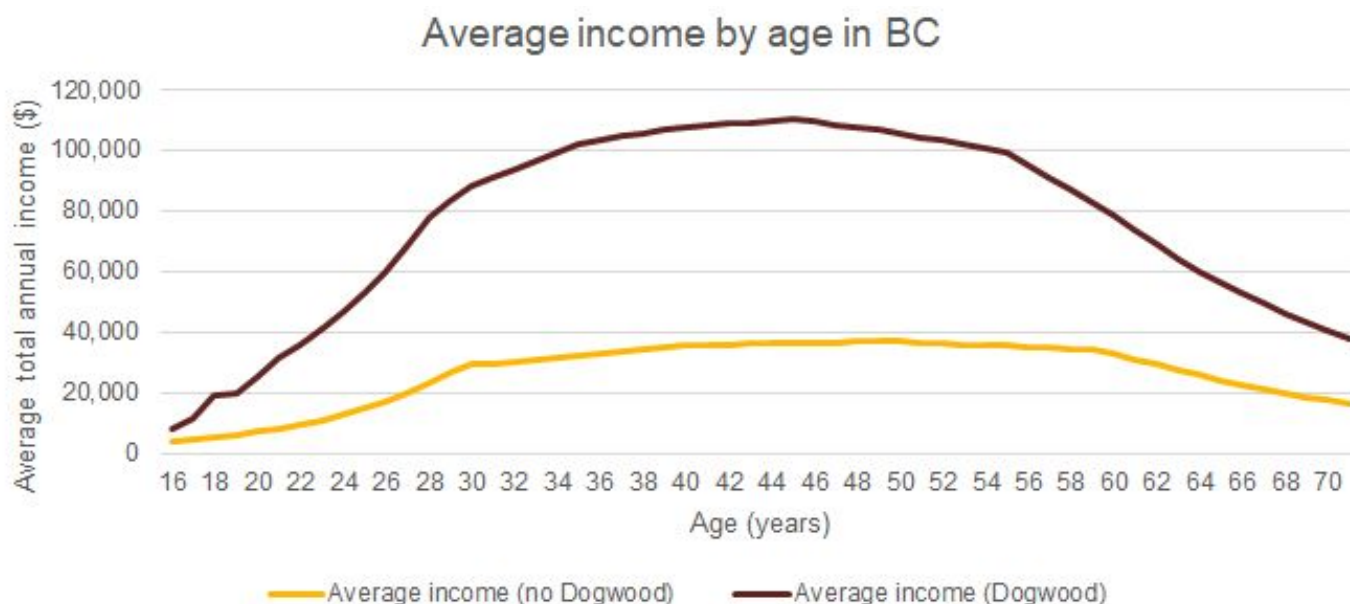
<sup>14</sup> An English Language Learning (ELL) student is defined as a student enrolled in a B.C. school who needs additional English language development support in order to access the provincially prescribed curriculum and succeed in the academic environment. <https://www2.gov.bc.ca/gov/content/education-training/k-12/teach/teaching-tools/english-language-learning>

For every student that graduates with a Dogwood diploma, versus one who does not, we calculated the future increase in lifetime earnings to be approximately \$850,000 in net present value based on data sourced from Statistics Canada (see Figure 5 below)<sup>15</sup>. This means that if 100% of the future lifetime earnings benefit of a student's graduation were to be attributed to Take A Hike, the SROI per student would be 1:57 (\$850,000 divided by a cost per student of participation in Take a Hike of \$15,000). However, using the 9% attribution the net present value of the per student impact is **\$74,000** giving an SROI of 1:4.9.

Additional research is required to further refine the attribution assumption that describes to what extent the Take a Hike program increases six year completion rates. Analyses with larger datasets for other alternative education programs have calculated higher rates of contribution to a student's graduation. One study of an alternative education program with access to a larger dataset calculated an average of a 23% increase in graduation rates across Canadian study sites in 2016-2017<sup>16</sup>. If we use an assumption that 20 percentage points of increase in likelihood to graduate can be attributed to Take a Hike, then the impact would rise to **\$170,000** per student giving an SROI of 1:11.

The Take a Hike alumni survey found that 71% of respondents had gone on to pursue higher education after leaving Take a Hike (see Appendix 2). Data on higher education outcomes for individuals who complete Dogwood in BC is not currently available as a baseline from which to measure Take a Hike's attribution and therefore it has not been possible to estimate this impact in the SROI. However, according to the Statistics Canada data<sup>15</sup>, individuals who achieve a certificate, diploma or degree beyond secondary (high) school are likely to experience greater lifetime earnings and therefore the SROI may be larger if higher education impacts were included.

Figure 5. Average total income by age in BC depending on highest certificate obtained (PwC analysis of Statistics Canada data)



<sup>15</sup> Data is 'Total - Work activity during the reference year'. This includes part time and full time employment- commensurate with the Take a Hike sample size. Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016261. (Data adjusted to 2019 CAD). Data is based on the highest certificate obtained, in this case individuals who achieve a secondary (high) school diploma or equivalency certificate versus individuals who have no certificate, diploma or degree.

<sup>16</sup> <https://www.pathwaystoeducation.ca/the-impact/> and <https://www.canada.ca/en/employment-social-development/corporate/reports/evaluations/pathways-education-report.html#h5.3>

## 2. The social return of mental well-being

The social return of mental well-being relates to improved youth mental health and resilience due to Take a Hike's incorporation of a dedicated clinical counsellor per classroom. As many of the vulnerable youth in this program have been identified as having complex needs designations<sup>17</sup>, this is vital to the success of the youths. The results of the alumni surveyed found that 81% of alumni believed they have a mental illness, and 61% of the alumni had been diagnosed with a mental illness at some point in their lives. Of the 61% diagnosed with a mental illness, 56% of those alumni were diagnosed with more than one mental illness. For the lower bound of our estimates relating to mental health, we have used the assumption that 61% of a cohort have a mental illness.

It is important to note that many of the alumni from the Take a Hike cohort would not personally identify with having a mental illness, but Take a Hike counsellors would identify that they do. The reluctance to self identify a mental illness is common amongst Canadians. In fact, an external survey found that stigma prevents 40% of Canadians from seeking help for anxiety and depression<sup>18</sup>. Our upper bound for the mental health impacts uses an assumption that 90% of a youth cohort have a mental illness, as clinical counsellors from the Take a Hike classrooms have indicated this is a more accurate representation of the cohorts.

The other key assumption for the mental health related impacts described below is the proportion of the change reported in the survey that can be attributed to Take a Hike as opposed to other factors. To this end, we have assumed for the lower bound estimate that 44% of the impact can be attributed to Take a Hike and for the upper bound we have assumed a 100% attribution of impact. For information on these assumptions see the 'Our SROI Approach' section.

To calculate the SROI of improved mental well-being of Take a Hike youths we focussed on deriving monetary values for the following impacts:

- a. reduced reliance on medical support services
- b. reduced problematic substance use
- c. reduced homelessness
- d. reduced crime

These are just a subset of the potential impacts that were selected by experts as likely the most significant and relevant from the materiality assessment. If more impacts were included then the total SROI of the mental health benefits Take a Hike creates could be higher.

### a. Reduced reliance on medical support services

There are many factors that reduce hospitalizations for mental health related illnesses, including community support programs, therapy, and peer support groups. The introduction of this support in communities has been known to reduce "revolving door" syndrome for mental health patients and the number of stays in hospital<sup>19</sup>. It was hypothesised that the support and resilience that Take a Hike teaches individuals may help to reduce the number of psychiatric hospital visits that an individual requires.

From the survey, it was found that prior to Take a Hike, 43% of alumni diagnosed with a mental illness had been hospitalized for a mental health related issue. After the program, the number of hospitalizations decreased by 17% (percentage points) in the surveyed cohort. In BC, the cost for a standard psychiatric hospital stay is \$15,200 CAD over 17 days<sup>20</sup>, and 13% of mental health patients had at least three stays throughout the year<sup>21</sup>. Therefore the cost saving associated with the reduction of hospitalizations and repeat hospitalizations was found to be between **\$1,000** (lower bound) to **\$3,300** (upper bound) per youth, assuming the avoidance of a hospitalization only occurs once in the individual's life time.

<sup>17</sup> Complex needs means behavioural or mental health concerns and includes BC Government R and H designations. R designated students are described as students who require behavioural support or who have mental illness. H designated students are described as students requiring intensive behaviour intervention or students with serious mental illness. Inclusive Education: Special Needs Designations and Categories in BC. *British Columbia Teachers' Federation*. <https://bctf.ca/publications/BriefSection.aspx?id=46986>.

<sup>18</sup> Mental Illness and Addiction: Facts and Statistics. *Centre for Addiction and Mental Health*. <https://www.camh.ca/en/driving-change/the-crisis-is-real/mental-health-statistics>

<sup>19</sup> Repeat Hospital Stays for Mental Illness. *Canadian Institute for Health Information (adjusted to 2019 CAD)*. [https://yourhealthsystem.cihi.ca/hsp/inbrief?lang=en#/indicators/007/repeat-hospital-stays-for-mental-illness/:mapC1:mapLevel2:overview:provinceC9001:trend\(C1.C9001\):/](https://yourhealthsystem.cihi.ca/hsp/inbrief?lang=en#/indicators/007/repeat-hospital-stays-for-mental-illness/:mapC1:mapLevel2:overview:provinceC9001:trend(C1.C9001):/)

<sup>20</sup> Based on analysis carried out by Angela Ly, based on Based on Table 2 of Stephen W. Hwang et al. (2011), "Hospital costs and length of stay among homeless patients admitted to medical, surgical and psychiatric services", *Medical Care* 49, 350-354.

<sup>21</sup> Repeat Hospital Stays for Mental Illness. *Canadian Institute for Health Information*. [https://yourhealthsystem.cihi.ca/hsp/inbrief?lang=en#/indicators/007/repeat-hospital-stays-for-mental-illness/:mapC1:mapLevel2:overview:provinceC9001:trend\(C1.C9001\):/](https://yourhealthsystem.cihi.ca/hsp/inbrief?lang=en#/indicators/007/repeat-hospital-stays-for-mental-illness/:mapC1:mapLevel2:overview:provinceC9001:trend(C1.C9001):/)

### b. Reduced problematic substance use

This impact area relates to a youth's improvement in mental health leading to a reduction in problematic substance use. The link between improved mental health and reduction in substance abuse has been identified in academic research<sup>22</sup>. Therefore improvement in mental well-being is hypothesised to reduce problematic substance use, and the consequent costs of problematic substance abuse for society. In Canada, the average likelihood of someone having a co-occurring substance use issue with a mental illness is 20%<sup>23</sup> and other studies have found that this can be up to 40% for youth<sup>24</sup>. From alumni survey data, it was identified that before joining the Take a Hike program, the co-occurrence of problematic substance use and a mental health issue within the surveyed population was 35%. After completing the Take a Hike program, the co-occurrence of these issues within the surveyed population dropped down to 13%, which is lower than the Canadian average.

The cost of substance use per year per affected individual in Canada including healthcare, lost productivity, and criminal justice costs is estimated to be \$1,140<sup>25</sup>. Using the lower and upper bound set of assumptions on attribution to Take a Hike and proportion of youths with mental health issues, the cost saved associated with the reduction in substance abuse was found to be between **\$400** (lower bound) to **\$1,400** (upper bound) per youth.

### c. Reduced homelessness

This impact area relates to a youth's improvement in mental health leading to a reduction in homelessness. The link between mental health issues and homelessness was found to be significant in the 2018 Report on Homeless Counts in B.C, where they found that 56% of respondents reported problematic substance use and 40% reported having a mental illness<sup>26</sup>. Therefore improvement in mental well-being due to the Take a Hike program may help to reduce homelessness, and the consequent costs of homelessness including shelter services, health services, and crime-related costs for society. It was found that, of the alumni surveyed, 30% had both a mental health diagnosis and had experienced homelessness before the program. After completing the program, the number of alumni with mental illness who had also experienced homelessness was reduced to 13% of the cohort, making the reduction of homelessness related to Take a Hike to be 17% (percentage points).

The cost of homelessness in Vancouver is \$56,000 dollars per year for someone with a mental illness, this figure included costs associated with shelters, social assistance, crime, and health<sup>27</sup>. To avoid overlap where possible, we included only the costs associated for shelters, supportive housing, incarcerations, and police, combining to a total of \$15,300 CAD/year for a homeless person with a mental illness. Using the lower and upper bound set of assumptions on attribution to Take a Hike and proportion of youths with mental health issues, the cost saved associated with the reduction of homelessness was found to be between **\$4,600** (lower bound) to **\$15,400** (upper bound) per youth.

### d. Crime reduction

As many of the impacts of Take a Hike are interrelated, there is a potential for double-counting values when it comes to estimating the social return on investment. The cost of crime was an impact that was initially identified as a material impact, but was found to be too difficult to value as distinct from the costs of homelessness and costs of substance abuse, therefore it has not been calculated separately but is included in these values.

Although the social cost of crime estimate has been incorporated into other material impacts, there were some interesting findings from Take a Hike's alumni survey. It was found that 11% of the alumni surveyed had committed a crime prior to joining the Take a Hike program. Of those alumni who had committed a crime, 75% have been diagnosed with a mental illness, and 50% had been previously homeless at some point. However, since the program, no alumni surveyed had reoffended. Furthermore, all alumni who had committed a crime before the program have since completed 1 or more diplomas, ranging from completion of Dogwood diploma to undergraduate level of education.

<sup>22</sup> <https://www.camh.ca/en/driving-change/the-crisis-is-real/mental-health-statistics>

<sup>23</sup> Mental Illness and Addiction: Facts and Statistics. *Centre for Addiction and Mental Health*. <https://www.camh.ca/en/driving-change/the-crisis-is-real/mental-health-statistics>

<sup>24</sup> <http://www.bcchildrens.ca/our-services/mental-health-services/youth-concurrent-disorders>

<sup>25</sup> Canadian Substance Use Costs and Harms: <https://www.ccsa.ca/canadian-substance-use-costs-and-harms-2007-2014-report> (adjusted to 2019 CAD).

<sup>26</sup> The Homelessness Services Association of BC, Urban Matters, and BC Non-Profit Housing Association (2018). *2018 Report on Homeless Counts in B.C.* Prepared for BC Housing. Burnaby, BC: Metro Vancouver.

<sup>27</sup> Latimer, E. A. et al. (2017). Costs of services for homeless people with mental illness in 5 Canadian cities: a large prospective follow-up study. *CMAJ Open*, 5(3), 576-585. doi: 10.9778/cmajo.20170018 (adjusted to 2019 CAD).



Image provided by: Take a Hike Foundation

### The social return of improved physical health

This impact relates to a youth's improvement in physical health and exercise habits through the introduction of adventure-based learning throughout the Take a Hike program. This includes: 1.5-3 hours of physical activity per week; weekly field trips doing activities all year round such as canoeing/kayaking, hiking, snowshoeing, etc; and three multi-day trips taken per year. Studies have shown that regular exercise can positively impact long term health, including cardiovascular health<sup>28</sup>. Therefore improvement in physical health and well-being is hypothesised to reduce cardiovascular disease, and the consequent costs of cardiovascular disease for society.

In Canada, the cost of heart disease is approximately 28 billion dollars per year<sup>29</sup>. In 2013, 68,000 people died of major cardiovascular diseases in Canada; 14% of those deaths were from people in British Columbia<sup>30</sup>. From this research, it was determined that the per year societal cost for each person who has cardiovascular disease in BC is on average \$406,000.

Research has shown that with moderate exercise three times per week, risk of cardiovascular disease is reduced by 19%<sup>31</sup>. This percent reduction was combined with data on the overall likelihood of dying of cardiovascular disease in BC<sup>32</sup> to calculate a percentage point reduction of 5% due to increased exercise. From the alumni survey, it was found that 34% of alumni had experienced improved physical activity habits, reporting they exercise 3 or more times per week after the program when they had been inactive before the program. The benefits of this increased exercise will only be realised in the future for these youths as the average onset of cardiovascular disease is 70 years. Therefore we have estimated the impact to begin at the age of 70 and discounted the costs saved back to net present value.

Using the lower and upper bound set of assumptions on attribution to Take a Hike, the cost saved associated with an improvement in physical health was found to be between **\$4,300** (lower bound) to **\$9,800** (upper bound) per youth.

Research also shows that improved physical health leads to improved mental health<sup>33</sup>, we have not included this co-benefit in our analysis as it would not be possible to quantify and value it as distinct from the other mental health impacts captured elsewhere in the SROI calculation.

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<sup>28</sup> Wen, C.P, et al. (2011). Minimum amount of physical activity for reduced mortality and extended life expectancy: a prospective cohort study. *The Lancet*. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(11\)60749-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(11)60749-6/fulltext)

<sup>29</sup> Canadian Journal of Cardiology. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2722492/#lpo=25.0002>. Including direct and indirect costs and adjusted to 2019 values.

<sup>30</sup> Statistics Canada. *Deaths and mortality rates (age standardizing using 1991 population, by selected grouped causes)*. <https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1310039301>

<sup>31</sup> Wen, C.P, et al. (2011). Minimum amount of physical activity for reduced mortality and extended life expectancy: a prospective cohort study. *The Lancet*. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(11\)60749-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(11)60749-6/fulltext)

<sup>32</sup> Statistics Canada. *Deaths and mortality rates (age standardizing using 1991 population, by selected grouped causes)*. <https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1310039301>

<sup>33</sup> Fox KR (1999). The influence of physical activity on mental well-being. *Public Health Nutrition* <https://www.ncbi.nlm.nih.gov/pubmed/10610081>

## Conclusion and lessons learned

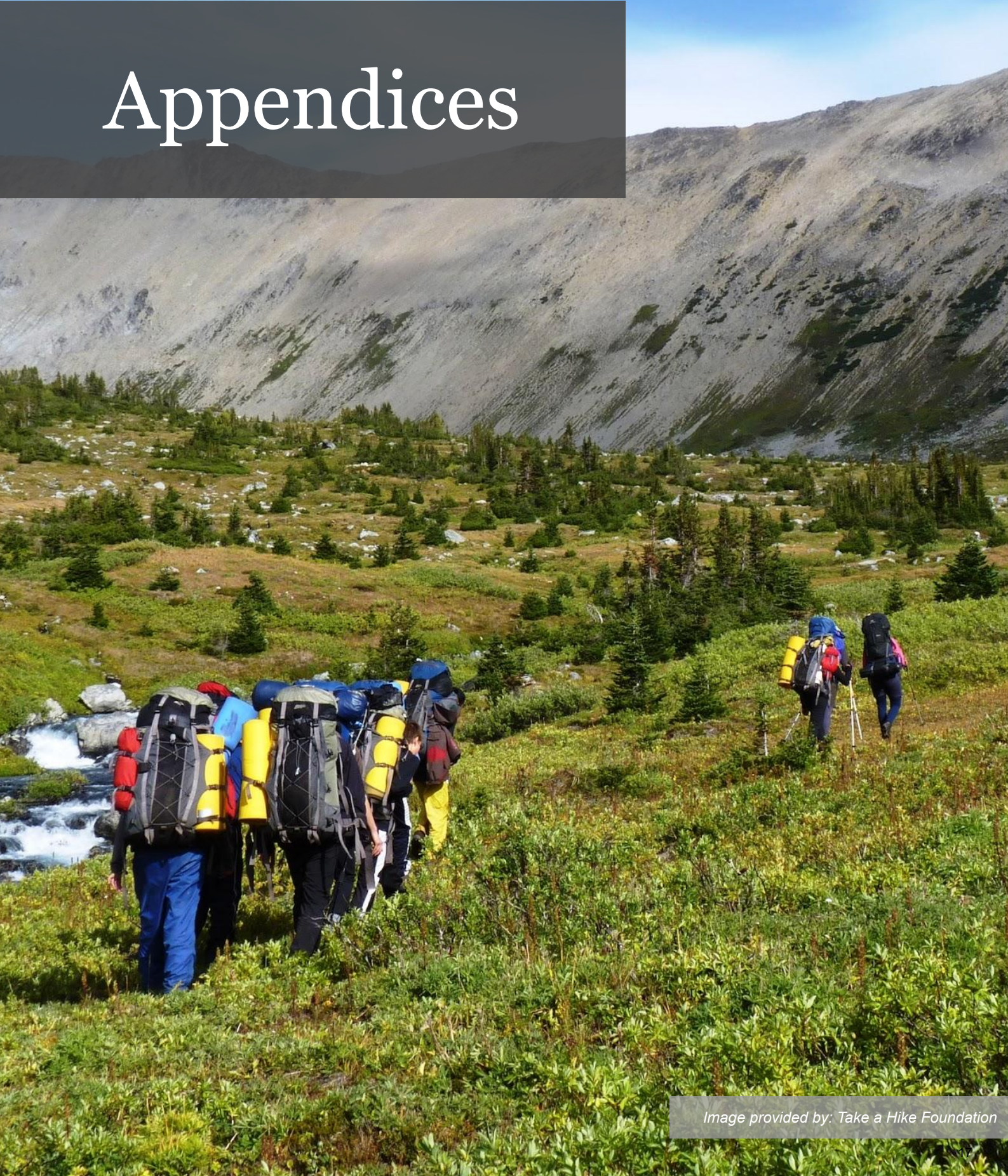
Subject to our methodology, a range of assumptions we made for the purposes of this study, and our limitations as noted in this report, our analysis estimates that the Take a Hike program generates between **\$5.60 and \$13.40 for every \$1** spent. The points below summarize some of the key findings from this analysis.

- The impacts of Take A Hike are broad; data collected for this study showed that youths benefit from improved mental well-being and consequently have a reduced reliance on medical support services, reduced problematic substance abuse, reduced homelessness, reduced participation in crime. Our research also found that youths have an increased level of physical well-being after Take a Hike and therefore may be healthier in the future. The analysis also estimates that Take a Hike students have greater future earnings potential due to an increased likelihood of graduation.
- However it was not possible to quantify and value all the potential impacts that Take a Hike creates. If more impacts had been included in the study then the SROI value would likely have been higher. Additional potential impacts include: improved well-being and mental health of family, increased likelihood of family members graduating (spillover effect), reduced reliance on food banks, increased charitable giving/ volunteering, increased participation in civil activities, increased engagement with conservation or environmental activities. Research that includes more impacts has indicated that the ROI of social and emotional learning programs can have an ROI as high as 1:86 and that it had the highest return on investment of the 15 interventions chosen for the study<sup>34</sup>.
- Our analysis found that the largest impact of the Take a Hike program is in helping students graduate with their Dogwood diploma meaning they will likely have increased future earnings over their lifetime. However in the upper bound estimate, even without including education uplift impacts, the total impact per youth of just the mental and physical health improvements is \$29,900, giving an SROI of 1: 2.0. This suggests that Take a Hike is delivering significant value to society through the focus on mental well-being and physical activity.
- The study has highlighted that the SROI of the program is highly sensitive to the increase in student graduation rate that can be attributed to Take a Hike. Future SROI analysis would benefit from a larger data set from which to estimate graduation likelihoods and over different time periods. For example, the education uplift analysis conducted with the Ministry of Education only looked at six year completion rates, however many Take a Hike students complete after seven or more years, where they may not have graduated at all without the support of Take a Hike.
- Another key variable in the SROI analysis is the cost of the program per youth. Data from Take a Hike shows that 25% of the cost of sending a youth to Take a Hike is due to fundraising activities. If the cost per youth were to reduce by 25%, for example if the government were to fund the program in its entirety and supplant the need for the fundraising spend, the SROI estimate would increase to between \$7.50 to \$17.80.

<sup>34</sup> Roberts, G., & Grimes, K. (2011). Return on investment: Mental health promotion and mental illness prevention. Canadian Policy Network at the University of Western Ontario and the Canadian Institute for Health Information. Retrieved from [https://secure.cihi.ca/free\\_products/roi\\_mental\\_health\\_report\\_en.pdf](https://secure.cihi.ca/free_products/roi_mental_health_report_en.pdf).



# Appendices



# Appendix 1

## Six-year completion rate statistical analysis

### Introduction

The questions undertaken to be answered with this research are: does the Take a Hike program make a difference in the likelihood of a student graduating? What is the impact of one month attendance in the program on graduation rates. Propensity score matching was combined with multiple regression methods to determine the impact of the Take a Hike program on student's graduation outcomes.

### Sample selection methodology

#### *Treatment group selection*

The Ministry had data from 235 students participating in Take a Hike program across 3 school districts. Of this group, 115 students had full 6-year on-time high school completion information, and therefore formed the 'treatment group'. The average duration of student participation in the Take a Hike program was 18 months. 65.5% students remained in a Take a Hike program for a duration of more than 12 months.

#### *Control group selection*

The 'control group' was created through the following steps:

1. Calculate the propensity scores of participation in Take a Hike.
2. Construct control group by choosing students who have the same propensity scores as the students in the Take a Hike.
3. Choose 345 students from Ministry of Education records as control group. 3 students in control match 1 in treatment.

This process attempts to make sure that the two groups are balanced in terms of students, schools, and neighborhood characteristics.

### Results from regression

The difference in the probability of graduating on time could be influenced by Take a Hike or other factors such as children in care, special needs, indigenous status, and English language learners. Multiple regression provides a way of adjusting for (or accounting for) potentially confounding factors.

$$y_i = \beta_0 + \tau_0 \times \text{Take a Hike}_i + \beta_j \times x_{ij} + u_i$$

$y_i$  is the probability for student  $i$  to graduate on time.

$\text{Take a Hike}_i$  is an indicator that takes a value 1 if student participates Take a Hike.

$x_{ij}$  is a student, school, or neighborhood factor such as gender, median family income.

The main finding is that the average treatment effect of Take a Hike participation is an 8.67% increase in probability for a student to graduate on time. However, there is some uncertainty in this figure, because the 95% confidence interval ranges from -54% (indicating a negative relationship between Take a Hike and graduation performance) and 71% (a positive relationship between attending Take a Hike and graduating on time). The sample size is small and therefore, combined with the large 95% confidence interval, we cannot say with certainty what effect Take a Hike has on graduation rate.

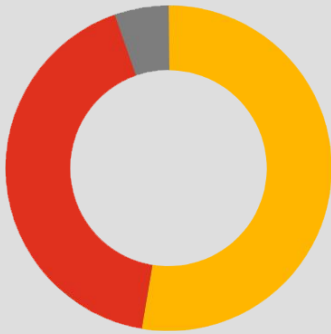
# Appendix 2

## Characteristics of alumni survey respondents

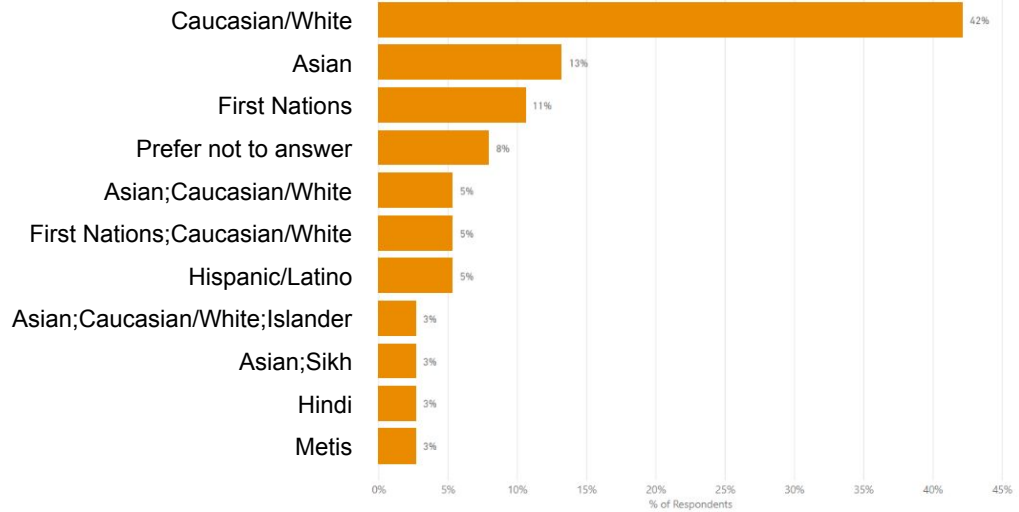
The survey was sent to approximately 100 alumni and 38 complete responses were received. The graphs below give a breakdown of the characteristics of the survey respondents

### Gender

Female  
**53%**  
Male  
**42%**  
Other  
**5%**



### Ethnicity distribution



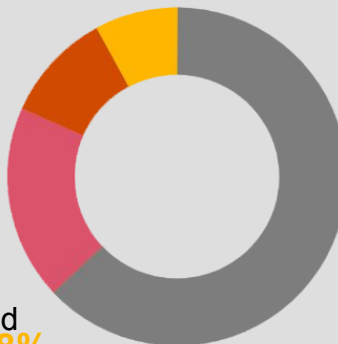
### Time spent in program

About 2 years  
**55%**  
About 3 years  
**34%**  
1 year or less  
**11%**



### Graduated with:

Dogwood diploma **63%**  
I don't know  
**18%**  
I didn't graduate  
**11%**  
Adult grad diploma **8%**



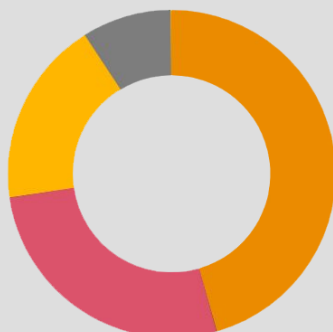
### Pursued higher education

Yes  
**71%**  
No  
**29%**



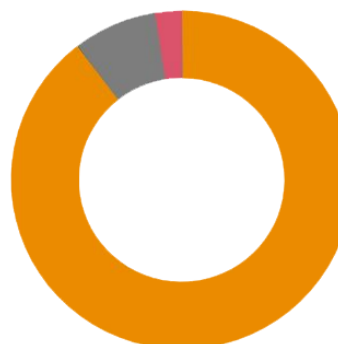
### Degree attained

Certificate  
**45%**  
Diploma  
**27%**  
Undergrad  
**18%**  
Certificate diploma  
**9%**



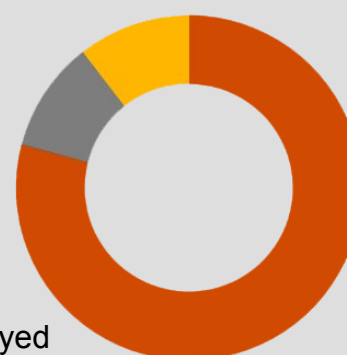
### Charged and found guilty of crime

No  
**89%**  
Yes, prior to Take a Hike  
**8%**  
I don't know  
**3%**  
Yes, after Take a Hike  
**0%**



### Employment status

Full time  
**79%**  
Part time  
**11%**  
Unemployed  
**11%**



# Appendix 3

## Attribution estimation

Within the alumni survey there were several questions that asked respondents to compare their attitudes before Take a Hike and after completing the program. Answers to these questions can be used as a proxy for the degree of change that Take a Hike has created in the impact areas in this study, as opposed to other factors. However, this is only a proxy and further surveys would help to further refine this relationship. For example, the additional data collected by Take a Hike from youth cohorts pre-program, mid-program and post-program would further help determine attribution. Data from the Take a Hike surveys were not available at the time of this report. Therefore, a lower and upper bound of attribution was calculated using the difference between the 'before Take a Hike' and 'after Take a Hike' responses for the questions listed below:

### Calculation Method:

Alumni survey respondents were asked to answer the questions below on a 1-5 scale. The questions were asked twice, firstly asking the alumni to reflect on their opinion before Take a Hike and secondly asking the alumni to reflect on their time at Take a Hike and their opinion after the program. The change in score given before and after the program was used to understand the difference experienced by the respondent as a result of the program.

### Questions used to determine lower bound of attribution:

1. 'Therapy has been a positive experience for me'  
Average response was 41% positive change.
2. 'Therapy has had a positive impact on my mental health'  
Average response was 38% positive change.
3. 'I feel equipped with tools and skills to manage my mental health'  
Average response was 51% positive change.
4. 'I understand what mental health services are available to me'  
Average response was 42% positive change.
5. 'I seek out mental health support when I need it'  
Average response was 46% positive change.

The responses to the questions on the left give us an average attribution percentage of 44%, this has been used as the most conservative end of the range in the SROI.

The upper range of the results uses an attribution of 100%, it is estimated that the actual SROI is within this range. Support for Take a Hike having a high attribution to the impacts calculated in this study came from other survey questions. For example in the table below, 100% of alumni gave at least one area in which they had experienced benefits, no youths selected the 'none' option. 60% of respondents said that they had experienced all of the benefits listed as options.

*Looking back, did you experience any of the following benefits from the Take a Hike program? ( select all that apply)*

a. Improved physical health	37 people - 97%
b. Improved mental health	36 people - 95%
c. Improved academic grades	32 people - 84%
d. An improved ability to express myself	32 people - 84%
e. A greater appreciation for spending time in the outdoors and in nature	36 people - 95%
f. A greater appreciation for the environment	33 people - 87%
g. A greater appreciation for my community	30 people - 79%
h. Other	3 people - 8%
i. None	0 people

# Appendix 4

## Sensitivity analysis

The table below compares how the results change as some key assumptions change.

<i>Impact and Variable</i>	<i>Lower bound value</i>	<i>Upper bound value</i>	<i>%change of upper compared to lower</i>	<i>% change on total results</i>	<i>SROI with lower bound</i>	<i>SROI with upperbound (holding all other variables at lower bound)</i>
<b>Education uplift</b> Attribution of impact	8.7%	20%	11.3%	+139%	1:5.6	1: 12.1
<b>Mental and physical health impacts</b> Attribution of impact	44%	100%	56%	+16%	1:5.6	1:6.5
<b>% Cohort with mental health issue</b> Baseline data	61%	90%	29%	+4%	1:5.6	1:5.8
<b>Cost of the program per youth</b> Input data	\$15,000	\$11,250	25%	+25%	1:5.6	1:7.5

The results of the sensitivity analysis show that the results are highly sensitive to the education uplift variable. Future SROI analysis would benefit from using a larger dataset of students from which to estimate Take a Hike's contribution to the changes in likelihood of a student graduating with their Dogwood Diploma.

The results are also sensitive to the cost of putting a youth through the program. Take a Hike estimates that it costs \$10,000 per year to put a youth through the program, youths stay on average for 18 months so a value of \$15,000 has been used in the SROI calculation.

However, Take a Hike estimates that 25% of the cost of putting a youth through the program is due to fundraising activities. Removing these fundraising costs e.g. through government funding the program in its entirety, would increase the overall SROI estimate to between \$7.50 to \$17.80.



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