Environmental Scan the Impacts, Including Social Benefits, of Accessibility and Social Inclusion for Persons with Disabilities

Final Report

Abbreviated Version

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Executive Summary

Estimation of the Societal Benefits of an Accessible and Inclusive Canada

Understanding the magnitude of the economic benefits, including both social and market/financial dimensions, of an accessible and inclusive society is vital for policymakers attempting to set priorities and implement effective measures in this policy arena. Insights into these benefits can raise awareness of the magnitude of the cost of excluding persons with disabilities from full participation in society and identifying priorities and opportunities for more efficient allocation of resources. Estimating the economic benefits of accessibility and inclusion (or conversely the cost of exclusion) is an essential component of economic evaluation and impact analysis in this area. The total economic benefits and the per case benefits identified in this study are ideal for this purpose.

This study measures the gap between the current situation in Canada in terms of accessibility and inclusivity, and a counterfactual world that would include an implemented Accessible Canada Act (ACA) and, more broadly, an accessible and inclusive Canada. A society that is fully accessible and inclusive is the ideal. In practice, it is likely a continuous process of improvement.

The key question addressed by this study is:

> *What would be the benefits to Canadian society, in reference year 2017, if Canada was accessible and inclusive in all domains relevant to full participation?*

The reference year 2017 was chosen because of the availability of a rich data source for that year, namely the Canadian Survey on Disability (CSD).

We note that only the benefits of an accessible and inclusive society are considered in this project. Invariably, there will be expenses/costs incurred by the public sector in developing and enforcing regulations, as well as in the delivery of goods and services associated with accessibility. For employers, there will be compliance costs and other expenses incurred in creating accessible and inclusive workplaces. Other organizations may also incur expenses/costs associated with the provision of accessible goods and services. These expenses/costs must be estimated as part of a full economic evaluation or impact analysis. Ideally, the benefits outweigh the costs at the individual stakeholder and aggregate level. The costing of regulatory development and enforcement, compliance activities and other expenses of creating accessible workplaces, and costs associated with the provision of accessible goods and services is not part of this project, but rather, will be undertaken as a separate exercise.

Literature that Informs the Model and Methods

Some related, applied work on the economic burden of injury and illness has been done in the occupational health and safety field and in the broader health sciences field. For example, Leigh (2011, 1997) has estimated the economic burden in the United States of work injury and illness across a range of conditions. The economic burden of injury and illness in Canada has been estimated by Health Canada (e.g., EBIC, 1998 and subsequent years). Many disease-specific costs of illness studies are also found in peer reviewed and broader literatures. These studies

estimate the economic burden based on a counterfactual scenario of no injury, illness or disease of the type being investigated. In the case at hand, a cost of exclusion study, one does not consider a counterfactual scenario of the absence of impairment or disability, but rather the absence of barriers to inclusion. Thus, a different conceptual approach needs to be developed to measure the cost of exclusion, or conversely the benefits of inclusion.

Some attempts have been made to estimate the economic benefits of accessibility and inclusiveness in certain domains of society, but the literature in this area is modest. To our knowledge, there is no study that has estimated the social benefits of an accessible and inclusive society in all domains for any country. In fact, to our knowledge, there is no study that draws on domestic and international expertise in order to propose and test a conceptual framework or specific methods for how to do so.

Development of a Conceptual Model

Given the modest literature base, we realized that there is much new terrain to explore in both conceptualizing and executing such a model. To facilitate the process, we took a multi-pronged approach in this project, which included synthesizing various studies that begin to explore components of the cost of exclusion, or conversely the benefits of inclusion. This synthesis informed the creation of our conceptual model.

Additionally, we undertook three parallel sub-studies to produce insights that were directly integrated into the model development. We provide a brief overview of our findings from each sub-study here. In the first sub-study, we undertook a scan of the international policy arena, including interviews with key informants and a review of existing international legislation and policy. In the second sub-study, we undertook a synthesis of Bill C-81 consultations via reports and briefings written by various stakeholder groups in Canada. In the third sub-study, we interviewed key informants from across Canada about their thoughts on the impacts/benefits of achieving the ideal of an accessible and inclusive Canada.

Key informants interviewed in the sub-studies emphasized the importance of including a broad spectrum of domains when considering the benefits of removing barriers to inclusion. Of significance, key informant consistently indicated that an accessible and inclusive Canada could have spillover effects beneficial to all members of society. For instance, increases in labour-force participation of persons with disabilities was cited by many informants as one the most important benefits for people with disabilities as well as for the broader labour market. Many noted that labour productivity of both persons with and without disabilities would be improved. Other areas mentioned as being significant outcomes were higher quality of life (QOL), reduced human rights complaints, lower levels of dependency on social safety net programs, reduced health care expenses, increases in tourism and reduced caregiving burden, to name a few. We have included these areas identified by key informants into our conceptual model.

In our international environmental scan, we were surprised to find that no comprehensive work on the cost of exclusion had been undertaken within industrialized contexts. In fact, several of the individuals we spoke to in senior policy positions in other countries and with international organizations were pleased to hear of the work we were undertaking and were interested in following up with us when the project was complete. They noted the importance of such work

for impact analysis of new legislation, and that our work would be of great value for their efforts in this area.

In summary, gathering field knowledge and stakeholder thoughts on a vision of an accessible and inclusive society has greatly informed the development of our conceptual model. Our search for relevant literature to help with both the development of the conceptual model and its execution was met with the realization that we were exploring substantially new terrain.

Execution of the Conceptual Model

The final version of our conceptual model has 14 domains as follows:

1. Healthcare Expenses;
2. Out-of-Pocket Expenses;
3. Output and Productivity;
4. Quality of Life and Social Role Engagement;
5. Life Expectancy;
6. Informal Caregiving;
7. Children with Disabilities;
8. Human Rights;
9. Transportation;
10. Tourism;
11. General Productivity;
12. Administration of Social Safety Net Programs;
13. Pensions; and
14. Market Multiplier Effects.

These domains are summarized in the body of the core study. We note that the aggregation of benefits into distinct domains is secondary to ensuring that the model is comprehensive and includes all relevant areas that could be impacted.

To execute our model for the Canadian context, we used a bottom-up approach. As noted, our reference year for the benefits was calendar year 2017. We considered all relevant domains of society as identified by key informants and the literature and listed above, rather than estimating only a subset of the benefits. A societal perspective was taken, so that benefits accruing to all stakeholders directly and indirectly were included in the analysis. These benefits were aggregated across all stakeholders to identify the societal benefits in broad domains, in total and per capita. Given the interrelated nature of many of the domains, we sought to minimize overlaps in our estimation and aggregation. We note that the lack of data on key parameters in the conceptual model presented many challenges to its execution, but we borrowed and adapted data from various sources to fill in gaps.

Results of the Model Execution

A summary of the results of our model is presented in the table below. Total benefits were estimated at $337.7 billion, or 17.6% of the Gross Domestic Product (GDP) in 2017, our reference year. In multiple one-way sensitivity analyses the maximum magnitude of benefits range was $252.8 billion to $422.7 billion, or from 13.1% to 22.0% of GDP.

The largest portion of benefits arises from improvements in the QOL and social role function for persons with disabilities, estimated at $132.2 billion (6.9% of the GDP). The second largest benefits are attributed to increases in output and productivity associated with a higher level of labour-force participation and concomitant earnings of persons with disabilities. These benefits were estimated at $62.2 billion (3.2% of the GDP). The spillover effects (i.e., benefits to other stakeholders, a composite of several of the domains listed above) were estimated at $76.7 billion (4.0% of the GDP). The market multiplier effects (i.e., market effects associated with higher levels of disposable income of consumers) were estimated at $47.3 billion (2.5% of the GDP). Averted healthcare expenses associated with improvement in the health of persons with disabilities were estimated at $19.4 billion (1.0% of the GDP). On a per capita basis, total benefits are estimated at $54,006 per person with a disability. The breakdown by component on a per capita basis (in order of magnitude) is $21,156 per person from increases in QOL and social role engagement, $9,957 per person from increases in output and productivity, $12,273 per person for spillover effects, $7,578 per person for market multiplier effects and $3,100 per person for averted healthcare expenses.

Table. Total economic benefits of an accessible and inclusive society

Category	Healthcare expenses	Output and productivity	Quality of life and social role engagement	Spillover effects	Market multiplier effects	Total benefits	Range for Total benefits*
Total	$19.4 B	$62.2 B	$132.2 B	$76.7 B	$47.3 B	$337.7 B	$252.8-$422.7 B
Percent	5.73%	18.42%	39.13%	22.70%	14.02%	100.00%	100.00%
Per person	$3,100	$9,957	$21,156	$12,273	$7,578	$54,066	$40,473-$67,675
Percent of GDP	1.0%	3.2%	6.9%	4.0%	2.5%	17.6%	13.1%-22.0%

*Range based on the widest confidence interval from the sensitivity analysis

We also estimated the benefits that accrue to the public sector, specifically the federal and provincial governments. Total potential increased revenues for the public sector were estimated at $61.0 billion. The largest proportion of increased total revenues is from the output and productivity impacts at $34.9 billion, comprising 57% of total revenues (federal: $17.0 billion, provincial $18.0 billion). This is followed by revenues from tourism and the market multiplier effects at $11.4 billion, comprising 19% of total revenues (federal: $5.4 billion, provincial $6.0 billion). The next is averted costs of social safety net program administration at $10.5 billion (17% of total revenues) (federal: $5.2 billion, provincial $5.2 billion). Then it is averted healthcare expenses at $4.2 billion (7% of total revenues) (federal: $0.3 billion, provincial $3.9 billion). Lastly, averted human rights discrimination complaints costs are $0.04 billion (0.1% of total revenues) (federal: $1 million, provincial $4 million).

Summary and Conclusions

In summary, people with disabilities and all members of society have the potential to significantly benefit from an accessible and inclusive Canada. Drawing from international and domestic insights and published literature we built a complex and multidimensional model to estimate the cost of inclusion. We estimated that removing barriers to inclusion could have contributed over $337.7 billion (with a range of $252.8 to $422.7 billion) to Canada's GDP in our reference year of 2017. This is a sizeable portion of the GDP in that year (17.6%, with a range of 13.1% to 22.0%) and is likely a very conservative estimate of the potential benefits.

Essentially, our study highlights the magnitude of the potential benefits to be supported through implementing the ACA and provides critical inputs needed for economic evaluation and impact analyses in this policy arena.

Glossary of Definitions and Acronyms

Definitions of Key Terms

Convention on the Rights of Persons with Disabilities (CRPD) – An international human rights treaty of the United Nations intended to protect the rights and dignity of persons with disabilities.

Discrimination – Situations in which a person with a disability is treated less favourably than a person without the disability in the same or similar circumstances

Gross Domestic Product – Measure of the market value of all final goods and services produced in a specific time period.

International Classification of Functioning, Disability and Health (ICF) – Biopsychosocial model of disability endorsed by the World Health Organization. Through the framework of the ICF model, *disability* is seen as an umbrella term, covering impairments, activity limitations, and participation restrictions. An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations. ICF also considers personal and environmental factors as being related to disability.

Quality of Life (QOL) – Umbrella term which captures multiple dimensions related to objective and subjective measures of *physical*, *mental*, *emotional*, and *social* functioning within one's life.

Reasonable Accommodations – Necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms.

Universal Design – Design of physical and virtual environments and products that are accessible to all people regardless of age, disability or other personal factors.

List of Acronyms

Accessibility for Ontarians with Disabilities Act (AODA)
Accessible Canada Act (ACA)
Accessible Transportation for Persons with Disabilities Regulations (ATPDR)
Americans with Disabilities Act (ADA)
Canada/Quebec Pension Plan-Disability (CPPD/QPPD)
Centers for Disease Control and Prevention (CDCP)
Canadian Community Health Survey (CCHS)
Canadian Institute for Health Information (CIHI)
Canadian Radio-television and Telecommunications Commission (CRTC)

Canadian Survey on Disability (CSD)
Canadian Transportation Agency (CTA)
Canadian Urban Transit Association (CUTA)
Community Integration Questionnaire (CIQ)
Craig Handicap Assessment and Reporting Technique (CHART)
Employment and Social Development Canada (ESDC)
Employment Insurance (EI)
Evaluation of Quality of Life Instrument (EQLI)
Federal Sector Labour Relations Board (FSLRB)
General Social Survey (GSS)
Gross Domestic Product (GDP)
Health and Medical Services Act (HMSA)
Health Assessment Questionnaire (HAQ)
Health Utilities Index (HUI)
Health-Related Quality of Life (HRQOL)
Human Capital Approach (HCA)
Impact on Participation and Autonomy Questionnaire (IPAQ)
Information Technology (IT)
Institute for Clinical Evaluative Sciences (ICES)
International Classification of Functioning, Disability and Health (ICF)
International Classification of Impairments, Disabilities, and Handicaps (ICIDH)
Life Habits Scale (Life-H)
Multifaceted Life Satisfaction Scale (MLSS)
Marginal Propensity to Consume (MPC)
Marginal Propensity to Import (MPI)
Mental Health Commission of Canada (MHCC)
National Disability Strategy (NDS)
National Health Service (NHS)
National Population Health Survey (NPHS)
Oxford Happiness Questionnaire (OHQ)
Participation and Activity Limitation Survey (PALS)
Patient Reported Outcomes Measurement Information System (PROMIS)
Pemberton Happiness Index (PHI)
Personal Wellbeing Index (PWI)
Pooled Registered Pension Plans (PRPPs)
Quality of Life (QOL)
Quality of Life Interview Schedule (QUOLIS)
Quality of Life Profile (QOL-P)
Quality of Life Questionnaire (QOL-Q)
Quality-Adjusted Life Years (QALY)
Registered Pension Plans (RPPs)
Registered Retirement Income Fund (RRIF)
Registered Retirement Savings Plans (RRSPs)
Restriction of Activities (RAC)
Convention on the Rights of Persons with Disabilities (CRPD)
Royal Canadian Mounted Police (RCMP)

Satisfaction with Life Scale (SWLS)
Social Role Participation Questionnaire (SRPQ)
Social Services Act (SOL)[1]
The Organisation for Economic Co-operation and Development (OECD)
Traumatic Brain Injuries (TBI)
WHO Quality of Life-BREF (WHOQOL)
World Health Organization (WHO)

[1] Initials reflect the original Swedish name

Introduction

Prior to the late 1960s and early 1970s, disability was viewed from a medical perspective and was considered as arising from an impairment which requires medical care, rehabilitation and individual adjustment (Kazou, 2017). However, in the period that followed, a social approach to understanding the nature and consequences of disability emerged, as disability activists and organisations run by persons with lived experiences drew attention to their social and economic exclusion and campaigned for social changes to improve their lives. The previously dominant medical understanding of disability was challenged, with focus placed instead on the impacts of social and environmental barriers and the discrimination and disadvantages experienced by person with impairments. The social approach was further advanced through the advocacy of persons with disabilities, which led to a growing academic discourse on disability, especially within sociology. Although disability was traditionally studied within the sub-field of medical sociology, and particularly the sociology of chronic illness and disability, the new discipline 'disability studies,' that was developed in the 1980s and 1990s began approaching disability from a social perspective (Kazou, 2017).

The social model of disability was first developed in Britain during the 1970s and 1980s. However, the social understanding of disability has been advanced by activists and disability studies scholars in several countries. This understanding proposes that disability is a form of oppression caused by social barriers that exclude persons with impairments from participation in society. Attention is drawn to the role of environment and society in creating barriers. This approach very much underpins the human rights approach to disability.

Over the period that followed, the World Health Organization (WHO) and others integrated the social understanding and medical understanding were integrated into a biopsychosocial framework, known as the disablement process, which is described in the International Classification of Functioning, Disability and Health (ICF) (WHO, 2001) and in earlier work by the WHO (1980). In this framework, a health condition or impairment is a necessary but not sufficient condition for disablement. The social and built environments are seen as key factors that can be enabling or disabling. Earlier work by Nagi (1965, 1991) also took this approach. With this approach, disability is conceptualized as arising out of the complex interaction between a health condition or impairment, barriers in the physical and social environment, and personal factors (Kazou, 2017).

The human rights model of disability looks to societal norms, practices and structures to understand the barriers that persons with disabilities experience. This approach focuses on the social, attitudinal and physical barriers that restrict the life choices and participation of persons with disabilities. Quinn et al. (2002) explain that the human rights paradigm for persons with disabilities is inspired by the values of dignity, autonomy, self-determination and equality. Moreover, the human rights paradigm for persons with disabilities considers that "Each individual is deemed to be of inestimable value, and nobody is insignificant. People are to be valued not just because they are economically or otherwise useful but because of their inherent self-worth" (Quinn and Degener, 2002, p. 14). This means that persons with disabilities have a stake in, and claim on, society regardless of considerations of economic or social utility.

Nonetheless, accessibility and financial affordability are inextricably linked. For example, the *Canadian Human Rights Act* requires accommodation of the needs of persons with disabilities up to the point of undue hardship, considering the cost, sources of available funding and health and safety requirements. However, previous research indicates that, when implemented effectively, accessibility accommodations have substantial benefits for persons with disabilities and others—such as employers—and these benefits may outweigh their costs (Padkapayeva et al., 2016; Jethoa et al., 2018)

The ICF framework suggests that disability is the variation of human functioning caused by one or a combination of the following: loss or functional deficit of a body part (i.e., impairment or health conditions); difficulties an individual may have in executing activities (i.e., activity limitations); and problems an individual may experience in involvement in life situations (i.e., participation restrictions). The three dimensions are co-equals in significance and are different facets of a single emergent phenomenon known as disablement. The framework also emphasizes that variations in human functioning are influenced by contextual factors, including environmental factors or aspects of the external or extrinsic world such as social systems and services, and personal factors such as age, ethnicity, gender, social status, etc. (Imrie, 2004). If these are not inclusive of the full range of abilities in society, then some individuals will be excluded due to a health condition or impairment. Exclusion from social role engagement (i.e., participation restriction) can occur in any number of social roles (e.g., paid work, education, leisure and sports, community and religious activities, and home and family).

In this study we draw on both constructs/models of disability—the social/human rights model and the socio-medical/biopyschosocial model advanced by the WHO and Nagi—to develop a conceptual framework/model for the costs of exclusion (or alternatively, the benefits of inclusion) of persons with disabilities from full participation in society. These two models are inclusive of the meaning of disability as identified in consultations with Canadians held by the federal government in 2015 and 2016 to develop Bill C-81, now the Accessible Canada Act (ACA). At that time, it was emphasized that disability should include a full range of abilities and limitations, including "invisible" disabilities, such as learning disabilities or mental health issues, and episodic disabilities, represented by fluctuating limitations that can occur with conditions such as multiple sclerosis or epilepsy.

Quantification/monetization of the cost of exclusion (or the benefits of inclusion) is, in principle, an economic exercise like the approach taken in the cost of illness/economic burden literature where economic methods are used to quantify and monetize the cost to society of particular injuries and illnesses (e.g., the economic burden of occupational asbestos exposure estimated by Tompa et al., 2017). These studies measure the gap between the current situation in which a health condition exists (e.g., lung cancer) and a counterfactual world in which it does not. Ultimately, the gap, which is the economic burden, is a burden that could be alleviated if the health condition were eliminated through some preventive mechanism. Essentially, it is the benefit that would be realized.

The counterfactual world for this study would be a fully implemented ACA and, more broadly, an accessible and inclusive Canada. Full accessibility and inclusiveness are an ideal, a gold standard. In practice, it is likely a continuous improvement process.

Cost of illness/economic burden information can be extremely useful to governments and industry leaders because it provides invaluable information on the benefits of investing in burden reduction efforts, such as legislation, policies, programs and practices to reduce the burden. Case costing from these studies can also serve as inputs in economic evaluations and impact assessments. In some instances, in which knowledge needs to be developed, information on burdens provides impetus for prioritizing knowledge development efforts. Nevertheless, estimation of the economic burden/cost of exclusion of persons with disabilities has not been undertaken for most countries, including Canada. This is likely due to the challenges associated with such a task. One of the challenges is methodological. There is little standardization of methods and some uncertain conceptual issues (Hays et al., 2002; Rohwerder, 2015; Walton, 2012). Data availability is another challenge. It is difficult to identify sources for the range of data needs.

Economic burden estimates are typically reported for a specific calendar year and are based on costs for all individuals newly diagnosed with and/or living with a health condition. If costs for both newly diagnosed and existing cases are included, the aggregate cost studies are referred to as prevalence cost studies because they encompass costs for individuals across the disease trajectory. If only newly diagnosed cases are included, then the studies are referred to as incidence cost studies. In this study, we take a prevalence cost study approach, since we are interested in costing the exclusion of all persons with disabilities in Canada at a point in time (a specific calendar year), regardless of the time of disability onset.

> *Prevalence study: An economic burden estimate in which the costs/burdens of all individuals experiencing a state and related stakeholders are considered, whether individuals are new to it or have been in that state for a long-time. Costs/burdens are generally estimated for only a one-year reference period.*
>
> *Incidence study: An economic burden estimate, in which the costs/burdens of only individuals newly experiencing a state and related stakeholders are considered. Costs/burdens are generally estimated for the entire lifetime of the individuals and discounted to a reference year.*

Some applied work on the economic burden of injury and illness has been done in the occupational health and safety field, and in the broader health field. For example, Leigh (2011, 1997) has estimated the economic burden in the United States of work injury and illness across a range of conditions. The economic burden of injury and illness in Canada has been estimated by Health Canada (e.g., EBIC, 1998 and subsequent years). Disease-specific cost of illness studies are found in the literature. These types of studies generally focus on three broad categories of costs: 1) direct costs (i.e., healthcare expenses), 2) indirect costs (i.e., labour-market output and productivity costs), and 3) intangible costs. In a cost of exclusion study, one does not consider a counterfactual scenario of the absence of impairment or disability, but rather the absence of barriers to inclusion.

In summary, the economic framework of cost-benefit/economic burden analysis has various tools that can be adapted to address the objectives of this study, but much work is needed to identify

the relevant domains of impact. Thus, we need to develop an understanding of the full range of relevant domains to consider in an economic burden/cost of exclusion study, how they might be measured (qualitatively, quantitatively and ideally monetarily), and how to aggregate them into a summary without double counting. The latter issue (i.e., double counting) is particularly a concern because of the interrelated nature of many of the domains.

Given the modest literature base, we realized that there was much new terrain to explore in both conceptualizing and executing such a model. To facilitate the process, we took a multi-pronged approach. Specifically, we undertook three parallel sub-studies to produce insights that were directly integrated into the model development. In the first sub-study, we undertook a scan of the international policy arena, including interviews with key informants and a review of existing international legislation and policy. In the second sub-study, we undertook a synthesis of Bill C-81 consultations via reports and briefings written by various stakeholder groups in Canada. In the third sub-study, we interviewed key informants from across Canada about their thoughts on the impacts/benefits of achieving the ideal of an accessible and inclusive Canada.

In this core study we synthesize the findings from the three sub-studies and review various studies that begin to explore components of the cost of exclusion to create the template for our model. We then execute the model using data from multiple sources.

Key Research Question

The key research question addressed by this study is as follows:

> *What would be the benefits to Canadian society, in reference year 2017, if Canada was accessible and inclusive in all domains relevant to full participation?*

As noted in the question, the reference year we use is 2017, which is the year in which the Canadian Survey on Disability (CSD) was completed. We draw on this survey for baseline information on key measures such as incidence of disability in the Canadian population. Specifically, the prevalence of disability, demographics, employment and income profiles of Canadians with disabilities have been extracted from the CSD (Morris et al., 2018). Population size and other key statistics are also drawn from 2017 data. We adjust all values (including monetary measures) to calendar year 2017.

A societal perspective is taken, so the benefits accruing to all stakeholders directly and indirectly impacted by an accessible and inclusive society are included in the analysis. These benefits are aggregated across all stakeholders to identify the societal benefits by broad category, in total and per capita.

We note that only the benefits of an accessible and inclusive society are considered in this project. Invariably, there will be expenses/costs incurred by the public sector in developing and enforcing regulations, as well as in the delivery of goods and services associated with accessibility. For employers, there will be compliance costs and other expenses incurred in creating accessible and inclusive workplaces. Other organizations may also incur expenses/costs associated with the provision of accessible goods and services. These expenses/costs must be estimated as part of a full economic evaluation or impact analysis. Ideally, the benefits outweigh

the costs at the individual stakeholder and aggregate level. The costing of regulatory development and enforcement, compliance activities and other expenses of creating accessible workplaces, and costs associated with the provision of accessible goods and services is not part of this project, but rather, will be undertaken as a separate exercise. In this project we focus exclusively on estimating the total benefits to society.

Definitions

The definition of *disability* that we use in the study is as follows:

> *disability means any impairment, including a physical, mental, intellectual, cognitive, learning, communication or sensory impairment — or a functional limitation — whether permanent, temporary or episodic in nature, or evident or not, that, in interaction with a barrier, hinders a person's full and equal participation in society.*

The definition of barrier that we use in the study is as follows:

> *barrier means anything—including anything physical, architectural, technological or attitudinal, anything that is based on information or communications or anything that is the result of a policy or a practice—that hinders the full and equal participation in society of persons with an impairment, including a physical, mental, intellectual, cognitive, learning, communication or sensory impairment or a functional limitation.*

These definitions are used in ACA (House of Commons of Canada, November 27, 2018) and are a summary of the social model of disability upon which the CSD (2017) is based. They are also consistent with our key question, noted above, that is focused on the benefits of an accessible and inclusive society.

Conceptual Framework

In Figure 1, we identify various domains drawn from the literature on disability-inclusive legislation and policy, as well as the knowledge gathered from the three sub-studies of this project. The figure identifies key domains that could be impacted. An attempt has been made to identify domains that are reasonably distinct, though invariable there are connections across domains. These are depicted with the two-way arrows linking adjacent domains. These arrows are meant to be representational. Though the arrows point to adjacent domains, in reality there are connections across many domains in the model. The model also includes the seven priority areas of the ACA, which received royal assent in the spring of 2019. These priority areas are as follows:

1. Employment;
2. Built Environment;
3. Information and Communication Technologies;
4. Communication Other than Information Communication Technologies;
5. Procurement of Goods, Services and Facilities;
6. Design and Delivery of Programs and Services; and

7. Transportation.

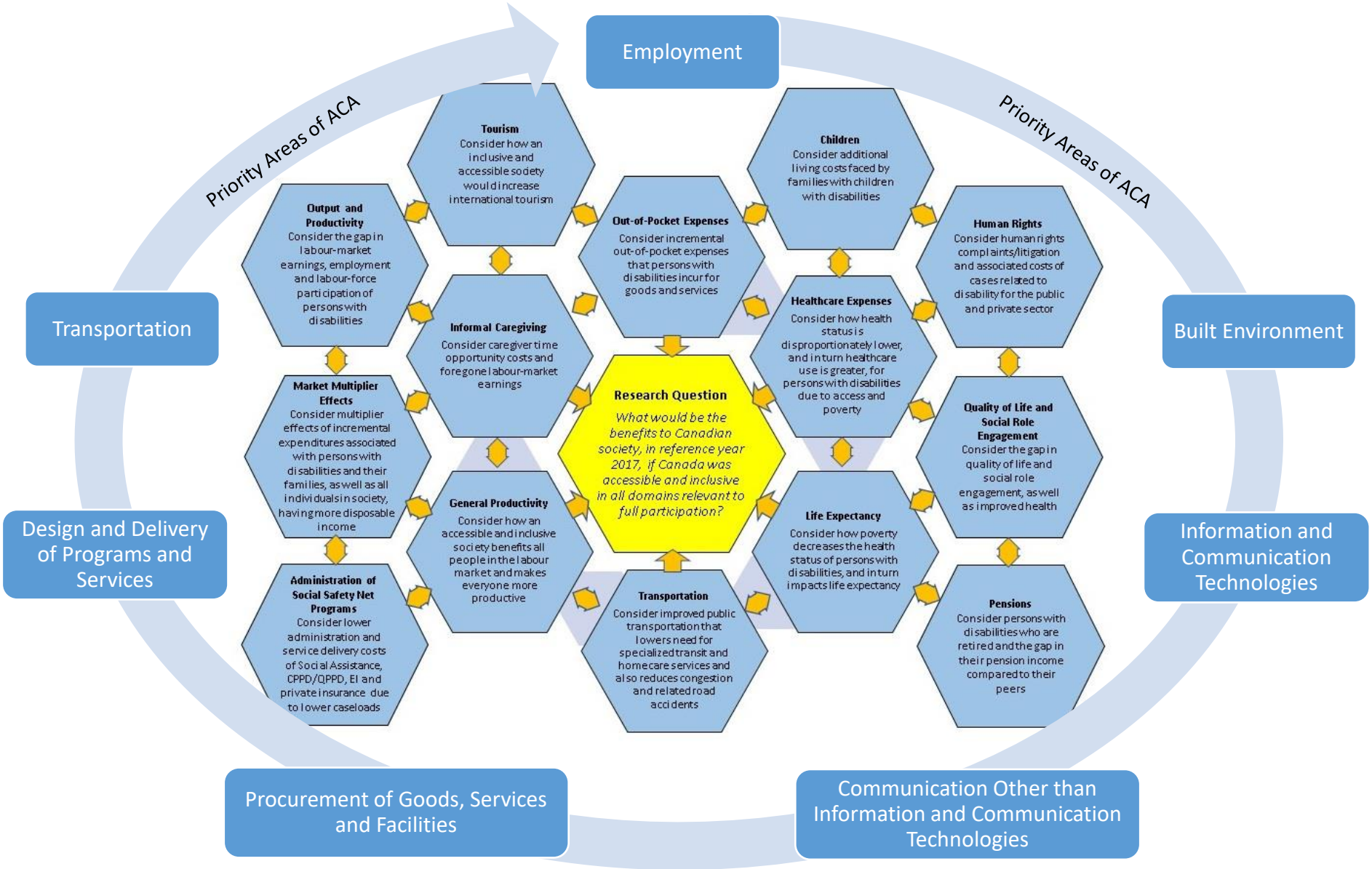
The priority areas support accessibility and inclusion in all the domains identified. Essentially, they are the structural underpinnings that facilitate the objective of making Canada accessible and inclusive in all facets of society. Hence, we have presented them as encircling the domains of our conceptual model.

The details and references for our methodology are presented in the following sections, organized by domain. Specifically, each section unpacks the details of the domains presented in Figure 1. There are 14 domains in total:

1. Healthcare Expenses;
2. Out-of-Pocket Expenses
3. Output and Productivity;
4. Quality of Life and Social Role Engagement;
5. Life Expectancy;
6. Informal Caregiving;
7. Children with Disabilities;
8. Human Rights;
9. Transportation;
10. Tourism;
11. General Productivity;
12. Administration of Social Safety Net Programs;
13. Pensions; and
14. Market Multiplier Effects.

These domains are summarized in the body of this core study.

Figure 1. Domains in the cost of exclusion



Methodology

We use primarily a bottom-up approach to estimate the economic benefits of an accessible and inclusive society, i.e., the forgone benefits in the current situation or cost of exclusion. The method has been synthesized from a number of studies, the key ones being: 1) The Price of Exclusion: The Economic Consequences of Excluding Persons with Disabilities from the World of Work (Buckup, 2009); 2) The Economic Benefits of Disability-Inclusive Development (Walton et al., 2012); and 3) Releasing Constraints: Projecting the Economic Impacts of Increased Accessibility in Ontario (Kemper et al., 2016). We also draw heavily on the literature reviewed and key informants interviewed in our three sub-studies. In particular, the key informants provided rich insights into the various domain where benefits might be realized from a more inclusive and accessible society.

We advance the methods drawn from previous studies in several ways. In particular, we consider all relevant domains in our study, rather than estimating only a subset of the benefits. Given the interrelated nature of many of the domains, we make the effort to minimize overlaps in our estimation and aggregation. Below we summarize the conceptualization of each of the domains and the computations undertaken in them.

Some of the benefits in the domains we include in our model may be considered direct benefits in that they accrue to persons with disabilities directly or are directly related to their experiences. The domains that fit into the direct category are healthcare expenses; out-of-pocket expenses; output and productivity; QOL and social role engagement; and life expectancy. Note that we include intangible benefits of QOL and social role engagement under the direct benefit category for simplicity, even if they are not readily monetizable. Other domains may be considered indirect benefits in that they accrue to persons without disabilities and other entities in society. Given this fact, they are sometimes described as spillover effects. The domains that fit into the indirect/spillover category are: informal caregiving; children with disabilities (which is focused on incremental costs incurred by families who have children with disabilities); human rights; transportation; tourism; general productivity; administration of social safety net programs; and pensions (which focuses on the impacts on the economy of increased spending of retired persons with disabilities). Note that the distinction between direct benefits and indirect benefits/spillover effects is not crisp, in that many of the domains are multifaceted with impacts on persons with disabilities, as well as others in society. More important than the distinguishing between direct and indirect is ensuring that the model is as comprehensive as possible, and that the benefits estimated within domains are distinct from those in others to minimize double counting (i.e., counting the same benefit twice). In general, we attempt to be conservative in our estimation of the magnitude of the benefits associated with each domain.

As a separate exercise, we also estimate the benefits that accrue to the public sector, specifically the federal and provincial/territorial governments. These are comprised of increased tax revenue and reduced expenditures on social safety net programs. Some elements of public sector benefits are simply reduced transfer payment arising from the fact that higher labour-force participation of persons with disabilities results in lower levels of dependency on social safety net programs and other such transfers. Even though they are included here, changes in transfer payment are not included in the societal perspective, since they do not reflect a loss or gain to society, but simply a transfer of purchasing power from one entity to another.

Domain of Healthcare Expenses

In this domain, we consider how health status is disproportionately lower, and in turn, healthcare use is greater for persons with disabilities due to access and poverty. More broadly, they have lower levels of income compared to persons without disabilities. In general, persons with disabilities are more likely to report greater healthcare use compared to their peers without disabilities (Drum et al., 2008; Cott et al., 1999), but we focus solely on poor health and associated increased healthcare use due to higher levels of poverty and reduced access compared to persons without disabilities. Much of these healthcare expenses could be averted if poverty levels and healthcare access of persons with disabilities were similar to persons without disabilities.

We begin with an estimate of the incremental healthcare expenses associated with poverty of approximately 20 percent, based on figures generated by the Health Council of Canada (Alliance for Healthier Communities, 2010) and the Public Health Agency of Canada (2004). Total healthcare expenses in Canada in 2018 were $242 billion (11.3% of GDP), or $6,604 per person (CIHI, 2018). Based on this information, we estimate the total healthcare expenses associated with poverty at $48.4 billion (20% of $242 billion).

We also estimate that 3.74 million people live below the official poverty line in Canada, according to the 2017 census (Statistics Canada, 2017a). Having the total healthcare expenses associated with poverty, and the number of people living below the official poverty line, we estimate healthcare cost associated with poverty at approximately $13,000 per case, as indicated in Table 1 in Annex 1 of this study. We use per case healthcare expenses associated with poverty to estimate the total healthcare expenses of persons with disabilities that are associated with poverty.

Given that there are no available studies on healthcare expenses for persons with disabilities in an accessible and inclusive society to draw on for precedence, we use *what if* scenarios to consider a range of possibilities for sensitivity analysis. The difference in poverty rates between persons with and without disabilities serves as a basis for estimating the healthcare expenses associated with access and poverty. In the baseline scenario, we assume no difference in poverty among persons with and without disabilities, and hence no difference in healthcare expenses associated with poverty. We define two other scenarios to estimate lower and upper bounds around this baseline value. To do so, we draw on studies by Anderson et al. (2011), and the Centers for Disease Control and Prevention (CDCP)(2019), who estimated the US national healthcare expenses associated with disability at $397.9 billion in 2006 for the adult population (representing 26.7 percent of the US national health expense). Assuming the US percentage regarding additional healthcare expenses for persons with disabilities compared to persons without disabilities, healthcare expenses associated with disability in Canada are estimated to be approximately $64.61billion. This estimate represents the “additional” healthcare expenses associated with disability over and above healthcare expenses of persons without disabilities. In the lower and upper bound scenarios, we assume that 5 and 20% of healthcare expenses associated with disability could be averted.

Domain of Out-of-Pocket Expenses

In this domain, we consider incremental out-of-pocket expenses that persons with disabilities incur for goods and services.[1] Some may be associated with healthcare needs, and others with expenses such as the provision of basic and instrumental activities of daily living or engaging in various social roles. Some expenses may be incurred for specialized aids and devices. In an accessible and inclusive society, the cost of living for persons with disabilities would be similar to their peers without disabilities. This would arise due to lower levels of need because of increased accessibility and inclusiveness, as well as the provision of needed services through social safety net programs.

To estimate the out-of-pocket expense for persons with disabilities, we use several reports that have been published in Canada. We start with the CSD (2012) and estimate out-of-pocket expense for assistance with activities of daily living under nine categories: preparing meals; everyday housework; heavy household chores; getting to appointments/errands; personal finances; personal care; basic medical care at home; moving around in the house; and childcare. For estimation of the weighted average of out-of-pocket expenses, we estimated 288,800 out of 3,775,920 of persons with disabilities are wheel-mobility devices users (Giesbrecht et al., 2017). We estimated the average out-of-pocket expense of wheel-mobility devices users at $1,649, and for non-users at $3,142 (CSD, 2012). We applied these average values to estimate the average out-of-pocket expense for the total population of persons with disabilities in 2017.

To estimate other types of out-of-pocket expense, we use a survey of the out-of-pocket expenses of families with children with disabilities undertaken by Employment and Social Development Canada (Roy et al., 2016). Different types of out-of-pocket expenses are presented in Table 2 through Table 5 in Annex 1. Nevertheless, it is important to note that the survey on which these tables are based includes a particular age ranges, specifically children, and as such is not representative of a comprehensive picture of out-of-pocket expense for adults with disabilities.

Given that there are no available studies on out-of-pocket expenses for persons with disabilities in an accessible and inclusive society on which to draw for precedence, we use *what if* scenarios to consider a range for sensitivity analysis. As a baseline scenario, we assume 50% of out-of-pocket expenses would not be incurred by persons with disabilities and their families if these services were provided through public sector programs. We also consider lower and higher scenarios of 20% and 80%, respectively.

Domain of Output and Productivity

Studies consistently indicate that persons with disabilities experience challenges participating in the labour market. The Statistics Canada's CSD indicate that persons with disabilities are less likely to be employed when compared to those without disabilities (59% vs. 80%) (Statistics Canada, 2018a). Commonly reported disabling health conditions (e.g., arthritis, depression,

[1] Some costs for devices, healthcare, medication, therapies, etc. may be covered by private insurance. Such expenses may be incurred out-of-pocket at the front end, but subsequently reimbursed to varying degrees. Our intent is to capture net out-of-pocket expenses that result in a higher cost of living for persons with disabilities. In an accessible and inclusive society, the cost of living for persons with disabilities would be similar to their peers without disabilities.

hypertension back pain) are associated with not participating in the labour market (Jetha et al., 2017).

In our approach, as baseline, we assume that the earnings potential of persons with disabilities is equal to their peers without disabilities in the same age bracket with similar education and skills if society were accessible and inclusive (i.e., full leveling up).[1] We also consider a lower bound scenario (i.e., partial leveling up), in which the labour-market income of persons with severe disabilities is that of persons with milder disabilities and milder disabilities is that of person without disabilities.

We draw on the methodology developed by Buckup et al. (2009), but modify it based on more recent data from the CSD (2017), building on previous analyses of the CSD data by Morris et al. (2018). Buckup et al. (2009) estimated the gap in output and productivity losses due to disability in three categories: 1) persons with disabilities who are employed but not able to use their human capital to the maximum; 2) persons with disabilities who do not find jobs (unemployed) because of their physical or mental impairment; and 3) persons with disabilities who have left the active labour force.[2]

To estimate the gap in output and productivity of persons with disabilities who are employed but not able to fully use their human capital, we compare the average earnings of persons with different severities of disabilities with persons without disabilities in the same age and sex group. We extracted median labour-market income profiles of Canadians with and without disabilities from the CSD (2017) (Data retrieved from Statistics Canada) (Table 6).

To estimate the gap in output and productivity of persons with disabilities who do not find jobs because of their physical or mental impairment, we compare the average employment rate of persons with different severities of disabilities with persons without disabilities in the same age and sex group. We extracted labour-market employment profiles of Canadians with and without disabilities from the CSD (2017). Table 7 in Annex 1 presents the numbers of employed persons in the Canadian population aged 15 to 64 years by disability status and severity. Table 8 in Annex 1 displays the numbers of the unemployed Canadian population aged 15 to 64 years by disability status and severity. The information is grouped by age group (appearing as row headers), persons without disabilities, persons with disabilities, with milder disabilities, with more severe disabilities, women, and men (appearing as column headers). Note that we did not estimate the labour productivity losses for those aged 65+, due to data limitation.

To estimate the gap in output and productivity of persons with disabilities who have left the active labour force, we modify the Buckup methods. Buckup assumed that there are higher economic inactivity rates among persons with disabilities compared to those reporting no disability. He compared the economic inactivity rates among persons with disabilities to those

[1] Two stages of leveling-up labour-market earnings of persons with disabilities to that of persons without disabilities could be considered in a more detailed analysis. The first stage would consider existing levels of educational attainment of persons with disabilities, and the leveling-up of earnings with their peers without disabilities. The second stage would leveling-up educational attainment and related labour-market earnings.

[2] Participation rate measures the percentage of people who are in the labor force, while the unemployment rate measures the percentage of people not employed but seeking work.

reporting no disability, and then monetized this gap using the average earnings of persons at a given disability level. However, we monetized this gap by considering the average earnings of persons without disabilities, as we want to be consistent with our underlying assumptions that in an accessible and inclusive labour market all people are able to participate equally, regardless of disability status.
We extracted the economic inactivity rates (labour participation) among persons with disabilities from the CSD (2017). Table 9 in Annex 1 indicates the numbers of persons in the Canadian population aged 15 to 64 years who are not in the labour force, by disability status and severity.

The underlying assumption in this section is that an accessible and inclusive labour market would allow all people to participate equally and earnings would be leveled-up, regardless of disability status. Another assumption inherent in this leveling-up is that persons with disabilities have the same level of human capital as their peers. This would imply similar levels of educational attainment and skills, which may not currently be the case due to barriers for persons with disabilities accessing education.

Domain of Quality of Life and Social Role Engagement

In this domain, we consider the gap in QOL and social role engagement, as well as improved health of persons with disabilities in an accessible and inclusive society. We provide a brief overview of the concept and the measurement issues concerned. In Appendix 5 we provide an extended overview of the literature on the conceptualization and measurement of QOL.

QOL for persons with disabilities is affected by many factors that may often interact in subtle ways. A key factor is the levels of engagement in various social roles. Other factors can include the type and degree of disability, the ability to accomplish everyday tasks or activities, satisfaction with social support, presence of a spouse or partner, attitude, coping skills, and level of self-esteem. Because of the adverse consequences of being marginalized in various social roles, there is likely to be a substantial improvement in the QOL of persons with disabilities within an accessible and inclusive society.

Hays et al. reported that the task of evaluating the QOL of persons with disabilities is particularly complex, as disability is not equated solely with a physical or functional impairment, but rather is a result of the social, attitudinal and physical aspects of society that create barriers to full participation (Hays et al., 2002). They evaluated the appropriateness of existing approaches for assessing the QOL of persons with disabilities (particularly the metric of health-related quality of life (HRQOL[1]) and quality-adjusted life years (QALY)). They note the growing acceptance of the social model of disablement and the minority group paradigm, suggesting that disability cannot be equated solely with a physical or functional impairment. Disability entails many additional dimensions, most notably, the problems of stigma and discrimination. The use of HRQOL measures, and particularly QALYs, is consequently less than optimal, as these measures are not designed to capture the full extent of QOL impacts, focusing instead and exclusively on HRQOL.

[1] HRQOL (Health Related Quality of Life) scale was developed by the United States Centers for Disease Control and Prevent as a measure of the impact of health outcomes (physical and mental) on a person's overall feelings of well-being. It is calculated through a series of questions (Healthy Days Measures) that ask respondents about their physical and mental health during the past 30 days. https://www.cdc.gov/hrqol/methods.htm

Due to the absence of a comprehensive approach to estimating all aspects of QOL, we use a HRQOL measure, specifically QALYs as estimated with the Health Utilities Index (HUI), to approximate QOL gains from progressing to an accessible and inclusive society. The estimation of loss of QOL is approximated by comparing the HRQOL for a person with and without disability in the current context.

To estimate the difference of HRQOL for persons with and without disabilities we drew on data from the Canadian Community Health Survey (CCHS). CCHS (2014) incudes disability data in the Restriction of Activities (RAC) module. The survey identifies persons with participation and activity limitations with the categories of sometimes, often, never/not applicable, and not stated. Respondents are classified according to the frequency with which they experience activity limitations imposed on them by a condition(s) or by long-term physical and/or mental health problems that have lasted or are expected to last 6 months or more. From the survey we also extracted the Health Utilities Index (HUI) of each group, (under categories of sometimes, often, never, not applicable, and not stated). The HUI provides a description of an individual's overall functional health based on eight attributes: vision, hearing, speech, ambulation (ability to get around), dexterity (use of hands and fingers), emotion (feelings), cognition (memory and thinking) and pain, and can take 1.00 (perfect health) through 0.00 (health status equal to death) to -0.36 (health status worse than death). Table 10 in Annex 1 presents HUI by disability category (i.e., sometimes, often, never, not stated).

To estimate the difference in HUI score for persons with and without disabilities, we use the HUI difference between persons with participation and activity limitations in CCHS and persons without limitations. We first collapse two categories of "sometimes" and "often" (as indicated Table 10) into one category and associated it with "persons with disabilities". Then we compare the HUI score for this group with that of the category "Never/Not applicable," which we associated with persons without disabilities. We do not consider "Not stated" in our calculation. We use difference in HUI score as identified above to estimate and approximate the difference in HUI score between persons with and without disabilities in the CSD (2017), under the assumption that the difference is the same for respondents in both surveys.

Table 11 in Annex 1 provides details of the number of persons with and without disabilities that are identified in CCHS (2014). As is apparent in the table, the number of persons with disabilities is more than what is identified in the CSD (2017) (i.e., 6,246,640 persons with disabilities in the CSD 2017). This is likely due to the difference in the definition of disability used in the surveys. Table 12 in Annex 1 also indicates the difference of the prevalence of disability across two data set by age and sex. As it indicates, the CCHS reported higher prevalence of disability in all age groups. The issue of comparability of different health measures has been extensively discussed in a report by Grondin (2016) in Statistics Canada. Although these definitions are not exactly the same, they could provide a ballpark estimate to the difference of the HUI for persons with and without disabilities.

Given that there is no study to draw on for the HRQOL for persons with disabilities in an accessible and inclusive society, we use *what if* scenarios to consider a range for sensitivity analysis. We define two scenarios for enhancements to HRQOL for persons with disabilities. In

the baseline scenario, we assume that in an accessible and inclusive society there is no difference in HUI of persons with and without disabilities. For a lower bound scenario, we assume that a 10% gap in HUI between persons with and without disabilities will continue to exist in an accessible and inclusive society. Table 13 in Annex 1 provides details on the difference in HUI for persons (15 years of age and older) with and without disabilities by age and sex, based on the CCHS (2014).

We translated HRQOL into monetary terms, drawing on frequently used values in the health economics field. The health policy and contingent-valuation literatures offer a range of monetary values for a QALY (e.g., Mackenbach et al, 2011; Hirth et al., 2000). We use $100,000, which is in the mid-range of the values identified in these literatures. We also undertake sensitivity analysis on the value of a QALY by using $50,000 and $150,000 as price weights. The former value was commonly used in the Canadian health technology assessment field in the 1990s (Tompa et al., 2017). It is still a reference threshold but has not been revised since 1992 when it was first proposed.

Domain of Life Expectancy

Within the Canadian context and globally, a modest body of research has estimated the life expectancy of persons with disabilities. These studies indicate that current generations of persons living with disabilities report longer life expectancies when compared to previous generations. However, when compared to those not reporting a disability, studies consistently indicate that a disability is related to a lower life expectancy (Lang et al., 2018; Thomas et al., 2010; Thornton, 2019). For instance, hospital discharge data was reviewed in a 5-year study of Nordic countries. Those reporting a mental health disorder had two to three times higher mortality than those without a disability (Wahlbeck et al., 2011).

It is important to note that the impact of disability on life expectancy can by direct (i.e., associated directly with the health impairment), as well through social pathways (e.g., poverty decreases the health status of persons with disabilities, and in turn impacts life expectancy).

Drawing on available research, we estimate the paid-labour-market output and productivity losses and HRQOL losses of persons with learning disabilities that are associated with premature mortality. We assume 14 years of losses due to shorter life expectancy for person with learning disabilities based on Thornton et al., (2019) and Learning Disability Today (2016). For sensitivity analysis we use 10 and 18 years. Following the approach taken by Tompa et al. (2017), we estimate the sum of working life years lost due to premature mortality and estimate the monetary value of lost earnings using the average wage of the general population for each age and sex category, discounting future lost earnings to the reference year 2017. We also estimate the sum of HRQOL years lost because of premature mortality and monetize QALY lost, using the values noted above.

Domain of Informal Caregiving

Emerging attention has been placed on public health and economic costs associated with informal caregiving (Talley et al., 2007). Informal caregivers refer to those who offer ongoing care and assistance, without pay, for family members and friends in need of support due to physical, cognitive, or mental conditions (Walton, 2012; Canadian Caregiver Coalition, 2001;

Petch et al., 2012). In Canada, caregivers tend to be over 45 years of age and have the potential to have interruptions in their labour-market activity during prime working years. In 2001, this represented approximately 2.7 million people (Canadian Caregiver Coalition, 2001). More recent estimates suggest that 8.1 million Canadian adults provide care to a friend or family member with a disability, chronic disease or needs due to aging (Sinha, 2013). Research also indicates that women are more likely to provide care to a friend or family member when compared to men (Sinha, 2013).

To estimate the value of caregiving services, we use the Hollander et al. study (2009). They estimated the replacement cost of unpaid care in Canada at $24.2 billion in 2007 dollars. However, in this study only caregivers aged 45 years old and older were included. They used homemakers' cost at the hourly market rate to monetize the value of caregivers' time. For extrapolation of this cost for the year of 2017, we use the average population growth rate of Canada (Statistics Canada, 2018b). Using the above information, we estimated the value of caregiving services at $31.6 Billion for 2017. Given that there is no study to draw on for the value of caregiving services provided by informal caregivers in an accessible and inclusive society, we use *what if* scenarios to consider a range for sensitivity analysis. For the baseline, we assume a reduction of 50% of the value of unpaid caregiving services, as in an accessible and inclusive society there would be less demand for caregiving services and some provision of caregiving services through publicly funded programs. For lower and upper bound scenarios, we assume a reduction of 30 and 100% of the value, respectively.

We use the Vanier Institute of the Family study (Battmas et al., 2017) to estimate the productivity losses due to caregiving-related absenteeism. They reported that employers across Canada incur an estimated $5.5 billion annually (2015 Canadian dollars) in terms of productivity loss due to caregiving-related absenteeism. This value is estimated from a study in the US about the double duty caregivers in the workplace. In the study, a survey reveals that caregiver are estimated to miss, on average, 10 days of work each year to handle care responsibilities in 2015 (CERIDIAN, 2015). Three-quarters of family caregivers (6.1M) were employed at the time, accounting for 35% of all employed Canadians. Of the employed caregivers, 44% reported having missed an average of 8–9 days of work in the past 12 months because of their care responsibilities. More than one-third of young caregivers (36%) arrived to work late, left early or took time off due to their caregiving responsibilities. Based on the caregiver absenteeism cost of $5.5 billion and a count of 6.1 million caregivers, we estimate the average per case productivity losses due to caregiving-related absenteeism at $902 per year (2015 Canadian dollars). We assume all persons with disability need a caregiver in the current situation, and that in an accessible and inclusive society there would be no productivity losses due to caregiving-related absenteeism.

Due to the absence of a comprehensive study regarding the well-being of informal caregivers of persons with disabilities in Canada, we developed our own estimate based on the HRQOL measure. To do so, we extracted the HUI for the general population from the CCHS (2010) for each age and sex group. We estimated the average annual HUI of informal caregivers, using their age and sex distribution based on the data from the Canadian Portrait of Caregivers Report 2012 (Table 14 in Annex 1) (Sinha, 2013). They reported the variance in each of the eight SF-36 scales ranged, from 14% for physical role functioning to 29% for vitality (Hughes et al, 1999). We draw

on this study and, as a conservative assumption, assume informal caregivers HUI is 14% lower than the socity's average. Then we use *what if* scenarios to consider a range for sensitivity analysis of loss of HRQOL of informal caregivers. For the baseline, we assume a reduction of 50% loss of QOL for caregivers. For lower and upper bound scenarios, we assume a reduction of 30 and 100% of the value, respectively. Lastly, we estimate the monetary value of QALY losses of caregivers, based on the approach taken by Tompa et al. (2017), as described under the domain title "Quality of Life and Social Role Engagement."

Domain of Children with Disabilities

In this domain we focus on the incremental expenses that families with children with disabilities incur compared to families with children without disabilities. Data and evidence are drawn from several sources. The most significant hurdle is to estimate the number of children younger than 15 with disabilities in our reference year.

It is important to note that the impacts on families with children with disabilities is not limited to out-of-pocket expenses. There are also work-related impacts on the parents of children with disabilities. For example, families who have a child with a more severe disability are more likely not to have a job, quit work, refuse a job or work shorter hours compared to families with a child with a less severe disability. Some of these impacts are identified in Table 15 (Roy et al., 2016) in Annex 1.

We recognize there are limitations and data gaps when it comes to measuring the number of children with disabilities in Canada for our reference year 2017. While there is no standardized method to estimate the number of children with disabilities, we attempt to do so by drawing on several data sources. We start with an estimate of the number of persons aged 0-14 from the 2016 Census (Statistics Canada, 2019a). We then estimate the prevalence of children with disabilities using data from the Participation and Activity Limitation Survey (PALS) 2006 (Statistics Canada, 2006). We assume that the prevalence of disability among children has remained the same since 2006 (i.e., children with disabilities as a proportion of all children has remained the same). Table 16 in Annex 1 provides details of the computations. For sensitivity analysis, we define two scenarios. A lower bound estimate is based on the PALS 2001 (Statistics Canada, 2001). A higher bond estimate is based on the trend in prevalence of children with disabilities observed between 2001 and 2006, with the assumption that the trend continued to 2017. It is important to note that the questions used to identify disability in the PALS are not the same as in the CSD (2017), so our estimate of prevalence of disability for children less than 15 in reference year 2017 is biased by the change in the disability screening approach.

To estimate the additional living costs faced by families with children with disabilities, we drew on the Roy study (Roy et al., 2016). They use the microdata file of the Statistics Canada's PALS (2006) to gather background information on families with children with disabilities as well as data on additional living costs and work-related issues for those families. Table 17 in Annex 1 identifies expected out-of-pocket expense of families with children with disabilities under five categories: 1) prescription and non-prescription drugs, 2) purchase and maintenance of aids and specialized equipment, 3) healthcare and social services, 4) transportation, and 5) help with everyday housework. We assume that in an accessible and inclusive society 50% of out-of-pocket expenses would be averted. This would arise due to lower levels of need because of

increased accessibility and inclusiveness, as well as the provision of needed services through social safety net programs. For sensitivity analysis, we consider two scenarios of 20% and 80% for lower and upper bounds of out-of-pocket expense averted (note, these percentages are the same as the ones used in the out-of-pocket expenses domain).

Domain of Human Rights

In this domain, we consider disability-related human rights complaints/litigation costs for the public and private sector. We focus on complaints that are received by the Canadian Human Rights Commission and their provincial/territorial counterparts. Between 2011 and 2017, disability-related complaints represented just over half of all the discrimination complaints received by the Canadian Human Rights Commission (Figure 3 in Annex 1) (Canadian Human Right Commission, 2017).

Registered complaints might be considered the "tip of the iceberg" of human rights related issues that may arise in society. Essentially, many such issues that arise in workplaces and elsewhere do not get taken to the commission level. They nonetheless result in expenses for the individuals and organizations involved. Even for cases that are registered, many get settled out of court so most of the costs incurred are by private entities rather than the public sector. For cases where there are out-of-pocket costs to the parties involved, there are output and productivity losses that impacts the employer and worker, lost revenue associated with an organization's tarnished reputation and intangible costs in terms of QOL.

Some cases are not heard by a Human Rights Commission, but rather by entities focused on specific sectors such as the Canadian Transportation Agency (CTA), the Canadian Radio-television and Telecommunications Commission (CRTC) and the Federal Sector Labour Relations Board (FSLRB). There are provincial counterparts to the FSLRB that hear cases for workers associated with provincial government collective agreements. There are other labour unions that deal with violations of collective agreements for their members. Civil society dedicates resources to support claimants, e.g., legal aid agencies which help people navigate the system and support cases that are systemic. There are also workers' compensation cases and appeals which are dealt with in the workers' compensation systems. Social assistance has its own entities and processes for addressing such cases. All in all, our estimates of cases and related costs will be substantially underestimated due to data limitations. We focus exclusively on human rights cases presented to the tribunals at the federal, provincial and territorial levels, and assume that in an accessible and inclusive society there are no disability-related discrimination complaint costs.

The assumption in our counterfactual scenario is that there is equal opportunity and treatment of all persons regardless of ability and, as a result, there are no human rights issue related to discrimination against persons with disabilities. Therefore, expenses incurred by stakeholders to consider these cases at the Human Rights Tribunal would not exist. We assume that cases found in favour of the complainant would also not exist in an accessible and inclusive society.

We extract the number of new cases of disability-related discrimination complaints at the provincial/territorial and federal levels as indicated in Table 18 in Annex 1. Given that there is no study available on disability-related discrimination complaint costs, we draw on the British

Columbia average human rights tribunal operating costs as a starting point to estimate the disability-related discrimination complaints case costs (BCHRT Annual Report 2017/2018). They estimated the total tribunal operating costs at $2,997,161 and the total number of the new complaint cases at 2,273 in 2017. We consider two times of average per case tribunal operating costs (i.e., $4,623) as a baseline scenario for the cost of disability-related discrimination complaint. The doubling of the administration costs is to account for the out-of-pocket costs incurred by complainants and defendants. For sensitivity analysis, we assume a range of one and five times the average per case tribunal operating costs for the lower and upper bound scenarios, respectively.

Domain of Transportation

Persons with disabilities consistently report that barriers to transportation represent a significant contextual factor that can hinder or facilitate participation in employment and educational activities (Belgrave et al., 1991; Vogel et al. 1998; Magill-Evans et al., 2008; Jongbloed, 2003). In the Canadian context, many persons with disabilities rely on specialized transit (e.g., Wheel-Trans, accessible publicly funded taxis) as a primary means of transportation. In 2011, the average cost per passenger for specialized transit services was $25.75, as compared to a cost per passenger of $3.31 for conventional transit in the same year (CUTA, 2013). Between 2003-2011, estimates also suggest that the kilometers traveled on specialized transit services in Canada has increased by 56% (Seider, 2013). At the same time, unaccompanied trips increased by 27% in the same time period. Literature on public transit points to many potential accommodations that can be made to improve accessibility and decrease the usage of specialized transport. Low floor buses equipped with kneeling capability and ramps on existing transit routes are key accessible transit features allowing mobility restricted persons and those using mobility aids (e.g., wheelchairs, walkers, etc.) to access conventional transit systems (Seider, 2013).

We estimate accessible and inclusive public transportation-related benefit in three separate parts. In the first part, we assume accessible and inclusive public transportation lowers the need for specialized transit and homecare services, and consequently the congestion and related road collisions. In the second part, we consider how accessible and inclusive public transportation lowers the transit operating costs. Finally, in the third part, we consider how accessible and inclusive public transportation lowers anxiety for Canadians commuters and helps save time savings. In the following paragraphs, we describe the underlying mechanics of each part in more detail.

The Canadian Urban Transit Association (CUTA) estimated $800 million of the economic cost of motor vehicle collisions involving senior drivers with mobility disabilities (Seider, 2013). They assumed that accessible and inclusive transit annually could reduce 1% reduction in in economic and social costs of motor vehicle collisions. This study only considered the costs and potential savings related to motor vehicle collisions by seniors with mobility restrictions. We draw on this study, as a starting point, to estimate the benefit of accessible and inclusive transportation for Canadian society. In our model, we considered the total annual economic and social costs of motor vehicle collisions at $25.0 billion, based on CUTA (Seider, 2013), and then assumed that accessible and inclusive transit annually could reduce 5% in economic and social costs of motor vehicle collisions. For sensitivity analysis, we assume accessible and inclusive transit could reduces 1 and 10% of the costs (i.e., as lower and higher bound scenarios).

CUTA reported making conventional transit more accessible could reduce the demand for expensive specialized transit service. The incremental net cost of serving one passenger on specialized transit rather than conventional transit is about $22 and Canadian specialized transit systems carry about 17.5 million passengers each year. The total incremental operating cost of specialized transit services is therefore about $385 million. Shifting 1% of specialized transit demand (about 175,000 trips) to conventional transit would save about $4 million in incremental operating costs; a 10% shift in demand (about 1.75 million trips) would save about $40 million. CUTA study considered the potential savings related to reduced specialized transit operating costs of about $385 million. We assume in an accessible and inclusive society that specialized transit demand is reduced by 10%.

The Canadian Transportation Agency estimated the benefits to Canadian passengers arising from the proposed Accessible Transportation for Persons with Disabilities Regulations (ATPDR) at $574.73 million (in 2012 Canadian dollars) over a 10-year period following implementation of the regulations related to ACA (Canadian Transportation Agency, 2019). Table 19 in Annex 1 indicates the monetized benefits from the Canadian Transportation Agency study. They also listed the non-monetized benefits to an accessible and inclusive transportation network include reduced anxiety, increased comfort, reduced stigmatic harm, wider access to desired destinations, increased employment opportunity, and greater independence for persons with disabilities. They also mentioned that all Canadians would benefit from time savings and the increased safety inherent in the accessible features of the national transportation network. Additionally, improvement in accessibility is expected to reduce the number of individual vehicles on the road, since public transport would be more convenient and affordable for persons with disabilities and others who would rely less on their personal vehicles. This reduction in the use of personal motor vehicles would also be expected to reduce carbon emission, decrease congestion, and lead to a reduction in the probability of accidents.

Domain of Tourism

In this domain, we consider how an accessible and inclusive society would increase international tourism to Canada. Accessible and inclusive tourism provides not only an important market opportunity, but also helps ensure that all people are able to participate in tourism and enjoy unforgettable travel experiences. In 2017, tourism in Canada generated $41.2 billion in gross domestic product (GDP), up 6.3% from the previous year. Tourism captured a 2.06% share of the total GDP, representing a gain of 0.02 percentage points over 2016 based on the National Tourism Indicators 2017 Highlights (Destination Canada, 2018).

Given that there are few studies available on accessible tourism in Canada on which to draw for precedence, we use *what if* scenarios to consider a range for sensitivity analysis. To estimate the potential benefits of accessible and inclusive tourism, we first extracted the gross domestic product of tourism in Canada as indicated in Table 20 in Annex 1 (Destination Canada, 2017). It is important to note that, in order to avoid double counting with other domains (e.g., the domain of output and productivity), we only consider the economic contribution of international tourism to the total benefit.

To estimate the current and future economic contribution of accessible tourism in Canada, we drew on the accessible tourism study from the EU, described above, specifically Table 21 in Annex 1 (European Commission, 2014). This table compares the direct economic contribution of accessible tourism by persons with access needs in EU 27 countries and 11 key international inbound markets.[1] We assume that the international tourism sector in Canada could benefit from further contribution by persons with access needs under similar scenarios of minimum (14.5%), medium (28.9%), and extensive (57.8%) improvements compared to the current scenario. Medium improvements category serves as the baseline, and we define that based on the minimum value of the EU 27 studies (Table 21 in Annex 1). The minimum and extensive improvements categories, which serve as the range for sensitivity analysis, are defined as $\pm 50\%$ around the baseline.

In addition to the direct contribution of increased revenues associated with accessible and inclusive tourism, there are indirect and induced effects to the broader economy, that we estimate through a multiplier effect. This spillover benefit is estimated similarly to that described in the domain titled "Markets Multiplier Effects."

Domain of General Productivity

Studies indicate that an accessible and inclusive labour market can positively impacts the productivity of all workers. While few empirical studies exist, literature in the field of industrial and organizational psychology highlights the potential benefits of making accommodations available to all employees (Solovieva et al., 2013). For instance, an online survey of 194 small and large workplaces conducted by the US-based Job Accommodation Network examined the benefits of providing accommodations to employees with disabilities. Some of the more frequently cited benefits included staff retention, increased overall productivity, lower training costs, improved co-worker interaction, and increased morale (Schur, 2002; Solovieva et al., 2011; Solovieva et al., 2013). Another survey of 5,000 managers and employees indicated that the provision of accommodations to employees with disabilities can have a spillover effects that positively impacts the attitudes and behaviours of co-workers without disabilities and increases the likelihood those without disabilities will also request an accommodation (Schur et al., 2014).

To estimate the benefits of increases in productivity and output of the broader labour market, we consider *what if* scenarios for sensitivity analysis, where the counterfactual is a percentage increase in output of the Canadian labour market, based on the national statistics on aggregate labour-market earnings. The baseline value is considered 0.75%, and 0.5% and 1% are considered as lower and higher bond. This counterfactual range is defined based on the Canadian labour productivity trend between 1980 to 2017, as indicated in Table 22 in Annex 1 (Statistics Canada, 2019b)

[1] Given that we do not have data on key inbound markets for Canada and that there is a need for tans-Atlantic/Pacific travel for most international tourists looking to visit Canada, we use more conservative values for the impact of inclusive and accessible tourism in our study than in the EU study.

Domain of Administration of Social Safety Net Programs

In this domain we consider lower administration and service delivery costs of Social Assistance, Canada/Quebec Pension Plan-Disability (CPPD/QPPD), Employment Insurance (EI) and private insurance due to lower dependency and lower caseloads.

Social safety net program administration/overhead costs incurred by the public sector and private insurers are estimated as a percentage of the costs of benefit expenditure for persons with disabilities. To estimate this cost, we draw on data retrieved from the annual accounts of national expenditure data on the major federal, provincial, and third sector programs that provide income support to persons with disabilities for calendar year 2013. The programs covered include social assistance, Canada/Quebec Pension Plans (CPPD and QPPD) disability benefits, Employment Insurance sickness benefits (EI Sickness), veterans' disability benefits and awards, workers' compensation benefits, private short and long-term disability benefits, and federal tax credits for persons with disabilities.[1] The percentage we use is different for the public and private sectors, as identified in Table 23 in Annex 1. Specifically, 15% is used for all programs except 20% for Veterans disability and pension awards and 25% for workers' compensation. These percentages are drawn from previous research that considered the administrative costs of private insurance and workers' compensation (Tompa et al., 2009). Various levels of reduction in administrative costs are considered in the model for sensitivity analysis.

Income benefits are not considered in our model as they are simply transfers of purchasing power. Expenses incurred by programs to provide services to beneficiaries, such as administrative costs, would be saved in the counterfactual scenario, as many of these costs would not be incurred within an accessible and inclusive society because persons with disabilities would not be dependent on transfer programs. As a baseline scenario, we assume 50% of administrative costs could be averted in an accessible and inclusive society. For sensitivity analysis, we also consider lower and upper bound scenarios of 20% and 80%, respectively.

Domain of Pensions

In this domain we consider persons with disabilities who are retired and the gap in their pension income compared to their peers. Pension income reflects lifetime contributions to private and public pension plans, as well as private retirement savings plans. To our knowledge, little research has examined the impact of a disability on contributions to pension plans over the life course.

We begin with an estimate of the before-tax median total income of persons age 65+ with and without disabilities in the CSD (2017), as indicated in Table 24 in Annex 1. This income estimate draws on data from the census-linked tax files (2015 reference year) and includes pension income.

We estimate the difference in total income of seniors with long-standing disabilities to that of their peers. We then consider two *what if* scenarios for sensitivity analysis, comprised of full and partial leveling-up of income between the two groups. In the full leveling-up scenario, it is

[1] It is worth noting that eligibility requirements for this tax credit apply only to those with very severe disabilities and some who qualify may not bother applying because the application process is quite onerous and only benefits those who have sufficient income to offset.

assumed before-tax median total income of persons age 65+ with disabilities is the same as persons without disabilities. In the partial leveling-up scenario, it is assumed that before-tax median total income of persons with severe disabilities will become equivalent to a persons with milder disabilities, and the income of those with milder disabilities will become equivalent to that of persons without disabilities. Note that in our model we only considered the multiplier effects of increased pension income for persons with disabilities and not the increased income itself, since that increase is realized in earlier years.

Domain of Market Multiplier Effects

This domain is about the expansion of markets from increased expenditures. In this domain we consider the multiplier effects of incremental expenses associated with persons with disabilities and their families, as well as all individuals in society, having more disposable income. Powers (2008) argues that increasing employment levels among persons with disabilities increases both the amount of goods and services produced in the economy and the demand for goods and services. This expansion is sometimes described as a multiplier effects, wherein each extra monetary unit spent in the market results in a magnitude of expansion of the market that is a multiple of the extra monetary unit spent. The multiplier effects are an economic concept which refers to the increase in final income arising from any new injection of spending. Every time there is an injection of new demand into the circular flow of income there is likely to be a multiplier effects, as injection of extra income leads to more spending and consequently creates more income. This is the philosophical basis of fiscal policy and tax reduction policy, which are often called on to stimulate the economy.

In the current context, the initial expenditure arises from several sources: 1) increased employment, output, productivity and related earnings of persons with disabilities; 2) increased labour-market earnings due to increases in life expectancy of persons with learning disabilities; 3) increased tourism expenditures; 4) increased output and productivity and related earnings of all labour-force participants; and 5) increased pensions of retired persons with disabilities. Since the expenditure sources are not public sector, tax-financed stimuli, many of the issues discussed in the literature on multiplier effects of macroeconomic fiscal stimuli are less relevant (e.g., issues of crowding out).

The size of the multiplier depends on several factors. Key ones are a household's marginal propensity to consume (MPC), marginal propensity to save, and marginal tax rate.[1] Also relevant is the leakage to markets in other countries, identified as the marginal propensity to import (MPI). Marginal propensities show the proportion of extra income allocated to particular activities. For example, if 80% of all new income in a given period of time is spent in the market of goods and services, the marginal propensity to consume would be 80/100, which is 0.8. Any incremental income will be taxed at the prevailing marginal tax rate, and the government will realize incremental tax revenue. For simplicity, we assume that all incremental tax revenue is spent on the provision of goods and services, such that the incremental tax revenue is also subject to multiplier effects. We assume the tax revenue that is spent has the same multiplier impact as private expenditures. Therefore, we collapse it into multiplier estimate by simply not

[1] The literature on multipliers associated with public sector fiscal stimuli note factors such as the unemployment rate, interest rate, state of the economy (i.e., business cycle), and the type of government spending.

including the marginal propensity to tax in our multiplier calculations. The following general formula is used to calculate a multiplier:

$$Multiplier = \frac{1}{1 - MPC + MPI} \qquad \textbf{Equation 1}$$

Statistics Canada indicated that 66.5% of household income earned by Canadians is spent on consumption (Destination Canada, 2018). We use a value of 0.3 for the MPI for Canadian consumption.[1] Hence, if consumers spend 0.665 and save 0.305 of every $1 of extra income, the multiplier would be:

$$Multiplier = 1/ (1-(0.665-0.3)) = 1.57 \qquad \textbf{Equation 2}$$

The multiplier value of 1.57 means that every $1.00 of new income generates $1.57 in GDP. For sensitivity analysis we use ±10%. Since the initial $1 was counted in the other domains of our conceptual model, the increment from the multiplier effects is $0.57 for every $1.00, or 57%. This is the value used to estimate the magnitude of the multiplier effects.

The Public Sector Perspective

For the public sector perspective, we considered all domains in our conceptual model that could have impacts on government revenues These revenues include: 1) income tax revenue from increases in output and productivity of persons with disabilities, 2) federal tax revenue on increases in payroll benefits, 3) income tax revenue from increases in general productivity, 3) various types of tax revenues (including sales tax, income tax, and corporate tax) from increases in tourism, 4) reductions in healthcare expenses, 5) reductions in social safety net program costs, and 6) reductions in human rights costs.

Table 25 in Annex 1 provides the values used to estimate the impacts on public sector revenues. To estimate income tax revenues, we begin with an income tax rate of 35.9% (OECD, 2019). We also consider lower and upper bounds scenarios of income taxes rates of 35% and 37.7%, respectively, based on the minimum and maximum income tax rates since 2007. To estimate the share of federal and provincial government revenues, we used the ratio of federal/provincial taxes (Statistics Canada, 2017c). We also considered 2.08% payroll tax for federal government revenues, with a lower and upper bound of 2.0% and 2.1% for sensitivity analysis purposes.

Figure 2 provides a schema of the approach taken to estimate the tax revenue from increased tourism and the market multiplier effects. We consider three types of tax: sales tax, income tax, and corporate tax. For sales taxes, we use a rate of 13% (11%-15% considered for sensitivity analysis). For income taxes, we use a rate of 35.9% (35%-37.7% considered for sensitivity analysis). To estimate the share of the federal and provincial tax revenues, we use the ratio described in the previous paragraph.

[1] We *were* unable to find a reliable reference for this value, but an internet example suggested that 0.3 was a good approximation (*alonso.stfx.ca/mgerriet/econ100/macro/multiplier.doc*, accessed March 10, 2019).

We assume 25% of the gross sales revenues (i.e., after-sales tax revenue) is payroll expenses. A company's payroll expense will vary by sector. For instance, service industries usually have higher payroll costs. For sensitivity analysis, we consider upper and lower bounds of 15% and 30% of the gross sales revenues, respectively. To estimate the revenue from corporate taxes we use a rate of 26.7% (comprised of 15% federal and 11.7% provincial tax), with upper and lower bound values of 25% and 31% for sensitivity analysis. These values are assumed an average of all industries (Department of Finance, 2018; Trading Economics, 2017). To estimate the average gross benefit at the corporate level, we divide aggregated net profit over operating revenue across all industrial sectors (Statistics Canada, 2017d). The average gross benefit is estimated at 8.9% in 2017. We consider an upper and lower bound of 7.8% and 9.6% for sensitivity analysis. To keep the estimates manageable, we do not consider tax revenues related to income and expenditure impacts in other domains.

Figure 2. Tax revenue estimation for tourism and market multiplier effects

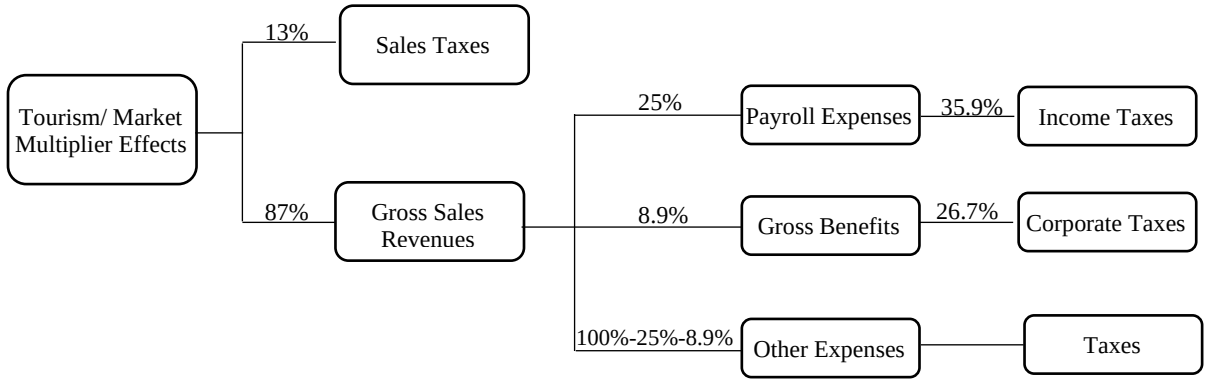


Table 25 in Annex 1 also provides the values used to estimate the impacts on public healthcare expense at the federal and provincial/territorial levels. We assume that 5% of total healthcare expenses in 2017 come from the federal government, municipal governments and social security funds (CIHI, 2017). The bulk of healthcare expenses are assumed to be provincial/territorial government spending, at 65% of total healthcare expenses in 2017. The remaining 30% comes from private sources. We assume the federal and provincial/territorial government spending on social safety net programs is 31% of total expenditures (Metcalf Foundation, 2015). The remainder is from other sources. Federal and provincial/territorial government spending on human rights discrimination complaints is estimated based on the number and cost of complaints as described in the domain title “Human Rights.”

Results of the Execution of the Conceptual Model

Total Economic Benefits

The results of our estimate of the societal benefits of an accessible and inclusive Canada are presented in several permutations. We begin with the total economic benefits clustered into five high-level categories:

1) Averted Healthcare and Related Out-of-Pocket Expenses;
2) Increased Output and Productivity of Persons with Disabilities in the Labour Force;
3) Increased Quality of Life and Social Role Engagement of Persons with Disabilities;
4) Spillover Effects; and
5) Market Multiplier Effects.

The first three might be viewed as impacts directly associated with persons with disabilities, followed by spillover effects (comprised of informal caregiving impacts, expenses incurred by families with children with disabilities, averted human rights discrimination complaints, transportation related benefits, and general productivity growth), and market multiplier effects (from various source of market activity). We profile the findings of the total economic benefits below, followed by details on the five high-level categories.

Details on the total economic benefits clustered by the high-level categories described above and also stratified by sex are provided in Annex 2 to this study in Table 26. The total benefits are estimated at $337.7 billion (with a range of $252.8 to $422.7 billion), or 17.6% (with a range of 13.1% to 22.0%) of the GDP in 2017, estimated at $1,922.8 billion in December. The largest portion of the benefits is from increases in QOL and social role engagement estimated at $132.2 billion (6.9% of the GDP). This is followed by increases in output and productivity at $62.2 billion (3.2% of the GDP), with a spillover effects at $76.7 billion (4.0% of the GDP), market multiplier effects at $47.3 billion (2.5% of the GDP), and averted healthcare expenses at $19.4 billion (1.0% of the GDP). The per case benefit is estimated at $54,066 (with a range of $40,473 to $67,675). In order of magnitude from largest to smallest, this is comprised of increases in QOL and social role engagement at $21,156/case, increases in output and productivity at $9,957/case, a spillover effects at $12,273/case, a market multiplier effects at $7,578/case, and averted healthcare expenses at $3,100/case.

Total economic benefits by the 14 domains described in the methodology are provided in Figure 4 in Annex 2, sorted by magnitude of benefit from smallest to largest. The largest benefit magnitude is from QOL and social role engagement, which comprises 39.1% of the total benefits. This is followed by output and productivity at 17.6% of the total benefits, then the informal caregiving at 17.5%, market multiplier effects at 14.0%, general productivity at 3.8%, out-of-pocket expenses at 3.7%, healthcare expenses at 2.0%, and lastly six other domains that each comprise less than 1% (tourism, administrative costs of social safety net programs, transportation, life expectancy, children with disabilities and human rights). Note that the domain of pensions is not considered separately, as the impact of this domain is included in the market multiplier effects.

Averted Healthcare and Related Out-of-Pocket Expenses

Table 27 in Annex 2 details the impacts on healthcare expenses. Averted public sector healthcare expenses are estimated at $19.4 billion, or 1.0% of GDP in 2017. The largest portion is averted out-of-pocket expenses at $12.6 billion, comprising 65% of the total. The second largest portion of these averted expenses is from the reduction in poverty and the related reduction in poor health. This amount is $6.0 billion and comprises 31% of total averted healthcare expenses. The smallest portion is averted healthcare program administrative expenses at $0.7 billion, comprising 4% of the total. On a per person with a disability basis, the averted healthcare expenses are $3,100, comprised of averted out-of-pocket expenses ($2,024), averted healthcare expenses associated with poor health ($958), and averted healthcare program administrative expenses ($119).

Increases in Output and Productivity of Persons with Disabilities in the Labour Force

Table 28 in Annex 2 details the output and productivity impacts. These impacts are estimated at $62.2 billion, or 3.2% of the GDP. The largest portion of the impacts is from output and productivity associated with increases in labour-force participation and related earnings of persons with disabilities. These increases are estimated to amount to $52.0 billion and comprise 84% of total output and productivity impacts. The second largest portion is increases in fringe/payroll benefits at $7.3 billion, comprising 12% of total output and productivity impacts. Averted costs in the administration of social safety net programs are $2.9 billion, comprising 5% of total output and productivity impacts. Output and productivity impacts associated with longer life expectancies of persons with disabilities is the smallest portion at $0.04 billion (< 0.1% of total output and productivity benefits). On a per person with a disability basis, output and productivity impacts are $9,957, comprised of increases in labour-force participation of persons with disabilities ($8,325), increases in fringe/payroll benefit ($1,166), averted costs in the administration of social safety net programs ($461), and output and productivity impacts associated with longer life expectancies ($6).

Increases in Quality of Life and Social Role Engagement of Persons with Disabilities

Table 29 in Annex 2 details the increases in QOL and social role engagement. The total number of QALYs gained is estimated at 1,321,565, equal to $132.2 billion (6.9% of the GDP) based on a value of $100K per QALY. The QALY benefits from increased QOL and social role engagement are estimated at 1,320,493 QALYs, equal to $132.0 billion, which is almost 100% of the benefits from this category. The QALYs gained from longer life expectancy are estimated at 1,072 QALYs, equal to $0.1 billion. On a per person with a disability basis, QALYs gained are 0.21, equivalent to $21,156.

Spillover Effects

Table 30 in Annex 2 details the spillover effects. These effects are estimated at $76.7 billion, or 4.0% of the GDP. The largest portion is from benefits to informal caregivers at $59.2 billion, or approximately 77% of the total spillover effects. This is followed by the impacts on general productivity at $12.8 billion (17% of the total spillover effects), then tourism at $2.5 billion (3%), transportation at $1.9 billion (3%), reduction in expenses of parents with children with disabilities at $0.12 billion (0.2%), and reduction in human rights cases at $0.08 billion (0.1%). On a per person with a disability basis, the spillover effects are $12,273, comprised of benefits to

informal caregivers ($9,484), impacts on general productivity ($2,043), tourism ($404), transportation ($309), reduction in expenses of parents with children with disabilities ($20) and averted human rights discrimination complaints ($13).

Market Multiplier Effects

Table 31 in Annex 2 details the market multiplier effects. Note that the net benefit of the market multiplier effects is estimated as the difference between the total market multiplier effects and the core impacts. The net market multiplier effects are estimated at $47.3 billion, or 2.5% of the GDP. The largest portion is from the output and productivity impacts associated with increases in labour-market earnings of persons with disabilities at $34.1 billion (72.0% of the net effects). This is followed by the general productivity impacts associated with increases in labour-market earnings at $7.3 billion (15.5% of the net effects), increases in pensions of persons with disabilities at $4.5 billion (9.4%), increases in international tourism at $1.5 billion (3.1%), and increases in life expectancy of persons with disabilities and related labour-market earnings at $0.01 billion (<1%).

Sensitivity Analysis

Table 32 in Annex 2 details the range of parameters considered for sensitivity analysis. Given the number of data elements required for the model and variety of assumptions needed to proxy for the various components, it is important to consider the sensitivity of the findings to different possible values of key parameters. Therefore, we estimated the sensitivity of the total benefits magnitude to different point estimates of the key parameters.[1] The parameters and ranges to be considered were based on our knowledge of what data elements and assumptions were most at issue. We also turned to the literature to see what sensitivity analysis considerations were made in other studies.

Figure 5 in Annex 2 presents a tornado diagram detailing how key parameters affect the total benefit in terms of percentage of GDP. The Figure has been sorted from the lowest to highest magnitude domain. The percentage ranges identified reflect changes from the baseline total benefits estimate of $337.7 billion (17.6% of the GDP). The domain with the largest impact on the total benefit is QOL and social role engagement and the smallest is tourism. The percentage of GDP ranges from 13.1% to 22.0% around the baseline value (with a range of $252.8 to $422.7 billion) for different values of QOL and social role engagement, whereas it ranges almost imperceptibly for tourism.

Public Sector Perspective

Table 33 in Annex 2 details the public sector perspective. Total potential increased revenues for the public sector are estimated at $61.0 billion. The largest proportion of increased total revenues is from the output and productivity impacts at $34.9 billion, comprising 57% of total revenues (federal: $17.0 billion, provincial $18.0 billion). This is followed by revenues from tourism and the market multiplier effects at $11.4 billion, comprising 19% of total revenues (federal: $5.4

[1] Note that probabilistic sensitive analysis was not possible as distributional information on point estimates for much of the input data was not available. It is common practice in the peer-reviewed and high-end grey literature to undertake single variable sensitivity analysis in cost-of-illness/economic burden studies undertaken at the country level. This is the case with Leigh (2011) and Tompa et al. (2017), to name just two of many.

billion, provincial $6.0 billion). The next is averted costs of social safety net program administration at $10.5 billion (17% of total revenues) (federal: $5.2 billion, provincial $5.2 billion). Then it is averted healthcare expenses at $4.2 billion (7% of total revenues) (federal: $0.3 billion, provincial $3.9 billion). Lastly, averted human rights discrimination complaints costs are $0.04 billion (0.1% of total revenues) (federal: $1 million, provincial $4 million).

Table 34 in Annex 2 presents the sensitivity analysis results for key parameters used to estimate government revenues. The lower and upper bound values are based on the minimum and maximum values over the last 10 years identified in the literature. Figure 6 presents the results of the sensitivity of public sector revenues to key parameters. Tax revenues from the output and productivity impacts can range from $31 to $40 billion, tax revenues from tourism and the market multiplier effects can range from $6 to $17 billion, averted healthcare expenses can range from $4 to $17 billion, averted costs of social safety net program administration can range from $2 to $9 billion, and averted costs associated with human rights discrimination complaints can range from $0.04 to $0.08 billion.

Summary and Conclusions

In summary, people with disabilities and all members of society have the potential to significantly benefit from an accessible and inclusive Canada. Drawing from international and domestic insights and published literature we build a complex and multidimensional model to estimate the cost of inclusion. We estimate that removing barriers to inclusion can contribute over $337.7 billion (with a range of $252.8 to $422.7 billion) to Canada's GDP in our reference year of 2017. This is a sizeable portion of the GDP in that year 17.6% (with a range of 13.1% to 22.0%) and is likely a very conservative estimate of the potential benefits. Essentially, our study highlights the magnitude of the potential benefits to be supported through implementing the ACA and provides critical inputs needed for cost-benefit and impact analyses in this policy arena.

Annex 1: Methodology Tables

Table 1. Healthcare expenses associated with poverty, 2017

Parameter	Value
Total healthcare expenses in Canada[1]	$242 Billion
Percent of healthcare expenses associated with poverty[2],[3]	20%
Expected healthcare expenses associated with poverty	$48.4 Billion
Number of people living below the official poverty line[4]	3,739,000
Expected healthcare expenses associated with poverty (per case)	$12,945
Canadians with disabilities living below Canada's official poverty line[5]	1,044,602

[1] CIHI, 2017. Available at: https://www.cihi.ca/en/how-much-does-canada-spend-on-health-care-2017
[2] Health Council of Canada, 2010. Available at: https://www.allianceon.org/poverty
[3] Public Health Agency of Canada, 2004. Available at: http://www.phac-aspc.gc.ca/ph-sp/disparities/pdf06/disparities_recommended_policy.pdf
[4] Statistics Canada, 2017a. *Persons living below Canada's official poverty line. Available at: https://www150.statcan.gc.ca/n1/daily-quotidien/190226/t002b-eng.htm*
[5] CSD, 2017

Table 2. Out-of-pocket expenses for prescription and non-prescription drugs (2006 Canadian dollars) (Roy et al., 2016)

Range	Less severe	More severe
No, out-of-pocket expenses	*65.7%*	*58.6%*
*Yes, out-of-pocket expenses**	*34.3%*	*41.4%*
Less than $100	32.0%	19.6%
$100 to less than $200	23.2%	19.2%
$200 to less than $500	17.5%	27.8%
$500 to less than $1,000	16.2%	11.4%
$1,000 to less than $2,000	8.1%	12.3%
$2,000 or more	3.0%	9.7%

**Includes amounts not covered by insurance such as exclusions, deductibles, and expenses over limits. Excludes payments for which the person has been or will be reimbursed by any insurance or government program.*

Table 3. Out-of-pocket for the purchase and maintenance of aids and specialized equipment (2006 Canadian dollars) (Roy et al., 2016)

Range	Less severe	More severe
No, out-of-pocket expenses	*90.4%*	*76.5%*
Yes, out-of-pocket expenses	*9.6%*	*23.5%*
Less than $200	31.9%	20.1%
$200 to less than $500	26.2%	24.8%
$500 to less than $1,000	13.7%	24.9%
$1,000 to less than $2,000	7.4%	16.4%
$2,000 or more	20.9%	13.8%

Table 4. Out-of-pocket expenses for healthcare and social services (2006 Canadian dollars) (Roy et al., 2016)

Range	Less severe	More severe
No, out-of-pocket expenses	*80.1%*	*71.8%*
Yes, out-of-pocket expenses	*19.9%*	*28.2%*
Less than $200	30.1%	13.3%
$200 to less than $500	26.6%	24.4%
$500 to less than $1,000	25.5%	25.7%
$1,000 to less than $2,000	12.0%	13.1%
$2,000 or more	10.8%	23.6%

**Includes amounts not covered by insurance such as exclusions, deductibles, and expenses over limits. Excludes payments for which you have been or will be reimbursed by any insurance or government program.*

Table 5. Out-of-pocket expenses for transportation (2006 Canadian dollars) (Roy et al., 2016)

Range	Less severe	More severe
No, out-of-pocket expenses	*81.6%*	*61.8%*
*Yes, out-of-pocket expenses**	*18.4%*	*38.2%*
Less than $100	39.3%	28.5%
$100 to less than $200	21.2%	23.1%
$200 to less than $500	26.1%	25.7%
$500 to less than $1,000	7.4%	10.9%
$1,000 to less than $2,000	4.5%	6.0%
$2,000 or more	1.6%	5.7%

**For example, travel to and from treatment, therapy or other medical or rehabilitation services; or extra expenses due to the need for more expensive transportation. Include amounts not covered by insurance such as exclusions, deductibles, and expenses over limits. Exclude payments for which you have been or will be reimbursed by any insurance or government program (Roy et al., 2016).*

Table 6. Median pre-tax personal income of Canadian population aged 25 years and over, by disability status, severity, age group, and sex, 2017 (CSD, 2017)

	Persons without disabilities		Persons with disabilities			
	Men	Women		Men		Women
Age			Milder	More severe	Milder	More severe
15-24	$11,097	$8,891	$8,553	$5,605	$7,945	$6,038
25-34	$42,985	$31,151	$39,013	$23,689	$29,636	$24,513
35-44	$57,514	$40,934	$54,997	$34,257	$36,548	$30,707
45-54	$62,374	$42,147	$54,386	$35,868	$38,494	$23,922
55-64	$48,865	$36,582	$41,050	$23,877	$33,761	$19,427

Table 7. Employment of Canadian population aged 15 to 64 years, by disability status, age group, severity, and sex, 2017 (CSD, 2017)

	Persons without disabilities		Persons with disabilities			
	Men	Women	Men		Women	
Age			Milder	More severe	Milder	More severe
15-24	1,021,610	920,340	64,870	17,220	129,760	29,390
25-34	1,701,890	1,464,390	131,590	30,340	220,620	65,720
35-44	1,650,280	1,515,070	172,950	56,870	207,820	81,230
45-54	1,673,870	1,614,650	248,830	78,410	239,610	99,660
55-64	1,226,990	1,100,720	224,330	88,590	162,540	103,390

Table 8. Unemployment of the Canadian population aged 15 to 64 years, by disability status, age group, severity, and sex, 2017 (CSD, 2017)

	Persons without disabilities		Persons with disabilities			
	Men	Women	Men		Women	
Age			Milder	More severe	Milder	More severe
15-24	191,050	147,720	17,200	6,560	27,710	8,850
25-34	121,100	105,680	18,430	6,930	13,010	8,040
35-44	92,070	69,080	15,920	8,260	9,860	10,970
45-54	102,400	70,580	14,150	10,270	12,540	11,440
55-64	84,500	49,750	24,800	11,390	10,100	13,540

Table 9. Canadian population aged 15 to 64 years who are not in the labour force, by disability status and severity, 2017 (CSD, 2017)

	Persons without disabilities		Persons with disabilities			
	Men	Women	Men		Women	
Age			Milder	More severe	Milder	More severe
15-24	687,870	640,440	72,390	52,240	71,330	48,890
25-34	155,620	324,160	29,060	29,120	35,610	37,190
35-44	101,400	271,410	21,770	42,920	51,930	62,010
45-54	139,480	270,370	35,760	101,330	65,820	129,070
55-64	395,550	607,300	96,580	171,240	149,880	256,400

Table 10. Health Utilities Index (HUI) for persons (15 years and over) with and without disabilities (CCHS 2014)

Participation and Activity Limitations[1]	Frequency	Mean weighted HUI
Sometimes	19.19%	0.82
Often	13.27%	0.57
Sometimes + Often	*32.50%*	*0.72*
Never/Not applicable	67.17%	0.93
Not stated	0.37%	0.67

[1] Variable RACDPAL denotes participation and activity limitations. For more detail regarding the method of calculation readers are referred to the Canadian Community Health Survey (CCHS), Annual Component – Public Use Microdata File, 2010. Derived Variable (DV) Specifications. pp.138.

Table 11. Number of persons (15 years and over) with and without disabilities (CCHS 2014)

Age group	Persons with disabilities	Persons without disabilities	Total population
15-24	970,462	3,585,365	4,561,457
25-44	2,246,956	7,140,748	9,399,108
45-64	3,699,734	6,082,283	9,825,500
65-74	1,441,497	1,780,916	3,243,348
+75	1,232,333	807,122	2,065,222
Total	**9,590,983**	**19,396,433**	**29,094,635**

Note. The number for persons with and without disabilities does not adds-up to the total, as some respondents did not respond to the question on participation and activity limitations.

Table 12. Comparison of the prevalence of persons (15 years and over) with and without disabilities (CCHS 2014; CSD 2017)

Age group	CCHS 2014[1]		CSD 2017[2]	
	Women	Men	Women	Men
15-24	16.3%	15.1%	15.6%	10.8%
25-44	19.9%	19.5%	17.7%	12.9%
45-64	35.7%	32.3%	25.2%	23.4%
65-74	44.8%	41.2%	33.3%	30.5%
+75	63.0%	58.1%	49.2%	45.0%
Total	**30.7%**	**27.5%**	**24.3%**	**20.2%**

[1] Including both groups of sometimes and often.
[2] Including both milder and sever groups.

Table 13. Health Utilities Index (HUI) for persons with and without disabilities (15 years and over) (CCHS 2014)

Age group	Women			Men		
	All person	Persons with disabilities[1]	Persons without disabilities	All person	Persons with disabilities[1]	Persons without disabilities
15-24	0.879	0.755	0.920	0.888	0.755	0.916
25-44	0.890	0.747	0.936	0.899	0.762	0.940
45-64	0.848	0.720	0.931	0.852	0.706	0.930
65-74	0.836	0.722	0.931	0.851	0.738	0.932
+75	0.724	0.606	0.907	0.763	0.655	0.901
Total	**0.856**	**0.715**	**0.930**	**0.869**	**0.724**	**0.930**

[1] identified through variable RACDPAL in CCHS 2014, includes both groups of sometimes and often. We did not consider " Not stated" in our calculation.

Table 14. Age and sex distribution of Canadian caregivers (Sinha, 2013)

	Number	Percent
Age		
15 to 24	1,250,536	15.5%
24 to 34	1,157,651	14.3%
35 to 44	1,143,473	14.1%
45 to 54	1,945,545	24.1%
55 to 64	1,620,403	20.0%
65 to 74	682,641	8.4%
+ 75	283,814	3.5%
Sex		
Male	3,716,645	46%
Female	4,367,418	54%

Table 15. Work-related impacts on parents of children with disabilities (Roy et al., 2016)

Work-related consequences	Percent
Not taking a job in order to take care of the child	26.4%
Quit working	21.6%
Lost a job	6.2%
Turned down a promotion or a better job	19.7%
Changed work hours to different times of day or night	36.5%
Worked fewer hours	38.4%
Financial problems because of child condition or health problem	17.9%

Table 16. Estimated number of the children 0-14 years old with a disability

Parameter	Value
Total number of the children (in 2017)[1]	5,913,180
Prevalence of disability among children (PALS 2006)[2]	3.7%
Prevalence of disability among children (PALS 2001)[3]	3.3%
Scenarios	
Baseline[4]	218,690
Lower[5]	192,908
Upper[6]	274,963

[1] https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501
[2] Statistics Canada, Participation and Activity Limitation Survey. 2006. Available at: https://www150.statcan.gc.ca/n1/pub/89-628-x/2007003/t/4125025-eng.htm
[3] Statistics Canada, Participation and Activity Limitation Survey. 2001. Available at: https://www150.statcan.gc.ca/n1/pub/89-628-x/2007003/t/4125024-eng.htm (Note: The Canada total excludes the Yukon, Northwest Territories and Nunavut).
[4] Estimated using Participation and Activity Limitation Survey (PALS), 2006
[5] Estimated using Participation and Activity Limitation Survey (PALS), 2001
[6] Estimated by assuming linear increase in the rate of disability among children based on the 2001-2006 trend (assuming the 2017 rate of disability among children at 4.7%).

Table 17. Expected out-of-pocket expense for families with children with disabilities (Roy et al., 2016)

Type[1]	Weighted average[2]
Prescription and non-prescription drugs	$513
Purchase and maintenance of aids and specialized equipment	$818
Healthcare and social services	$837
Transportation	$389
Help with everyday housework	$1,101

[1] Includes amounts not covered by insurance such as exclusions, deductibles and expenses over limits. Excludes payments for which the respondent has been or will be reimbursed by any insurance or government program.
[2] Values are in 2006 Canadian dollars.

Figure 3. The proportion of complaints received by the ground of discrimination in 2017 (Canadian Human Right Commission, 2017)

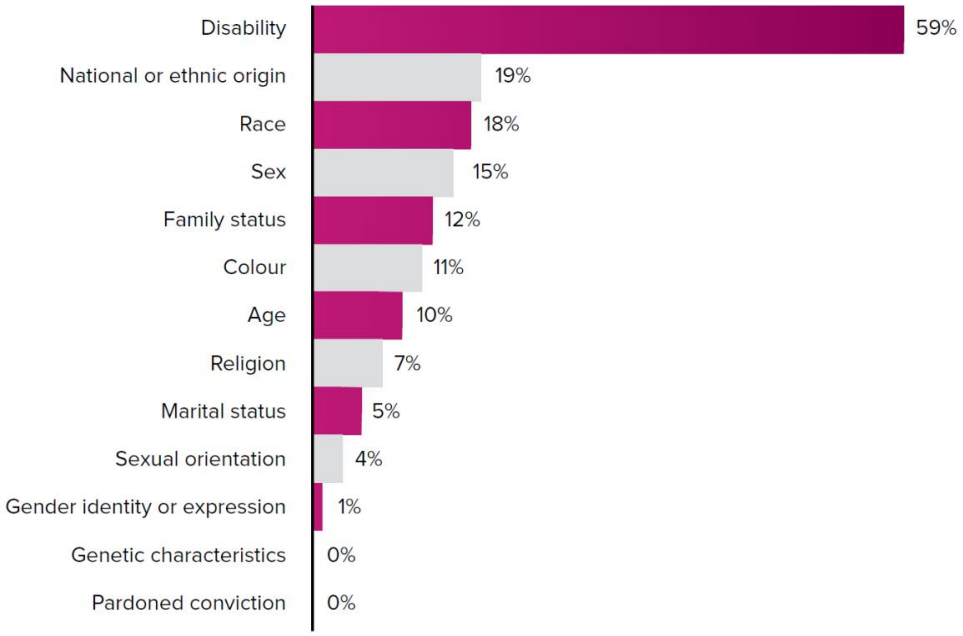


Table 18. New cases of disability-related discrimination complaints at the federal and provincial/territorial levels, 2017

Province/Territory	Province/Territory Human Rights Commission	Federal Human Rights Commission[11]
Alberta	1,317[1]	136
British Columbia	700[2]	152
Manitoba	141[3]	49
New Brunswick	100[4]	27
Newfoundland and Labrador	33[5]	-
Nova Scotia	147[6]	34
Ontario	12,934[7]	497
Prince Edward Island	46[8]	-
Quebec	2,089[9]	138
Saskatchewan	89[10]	34
Total	**17,597**	**1,083**

[1] https://www.albertahumanrights.ab.ca/about/Pages/annual_report.aspx
[2] www.bchrt.bc.ca/shareddocs/annual_reports/2016-2017.pdf
[3] http://www.manitobahumanrights.ca/v1/about-us/annual-reports.html
[4] https://www2.gnb.ca/content/gnb/en/departments/nbhrc/resources/annual-reports.html
[5] https://thinkhumanrights.ca/education-and-resources/annual-reports/
[6] https://humanrights.novascotia.ca/about/publications-reports-plans
[7] http://www.hrlsc.on.ca/en/reports-and-statistics/open-data
[8] http://www.gov.pe.ca/humanrights/index.php3?number=72437&lang=E
[9]http://www.cdpdj.qc.ca/fr/publications/pages/recherche.aspx?field=PublicationsMandat&value=Charte&title=Droits%20de%20la%20personne&groupbyfield=PublicationsSujet
[10] http://saskatchewanhumanrights.ca/learn/annual-reports
[11] http://chrcreport.ca/by-the-numbers.php

Table 19. Benefits of accessible and inclusive transportation in terms of time saving and reduced anxiety in 2012 (Canadian Transportation Agency, 2019)

Type of benefit	Value[1]
Reduction of anxiety for Canadians passengers	$533,202,582
Time-savings for Canadians passengers	$41,530,248
Total benefits (over 10 years)	$574,730,000
Annualized benefit	$87,560,000

[1] Values is in 2012 Canadian dollars.

Table 20. Tourism economic indicators in Canada

Indicators	Value
Tourism's contribution to GDP (2017 Canadian dollars)[1]	$41.2 Billion
Foreign component of travel and tourism's contribution to GDP (in 2016)[2]	21%

[1] Destination Canada, national tourism indicators highlight. 2017. Available at: https://www.destinationcanada.com/sites/default/files/archive/691-national-tourism-indicators-q4-2017/national-tourism-indicators-highlights-2017_final.pdf
[2] Travel and tourism economic impact Canada. 2017. Available at: https://zh.wttc.org/-/media/files/reports/economic-impact-research/archived/countries-2017/canada2017.pdf

Table 21. Direct economic contribution of European Union's accessible tourism under different scenarios by persons with access needs (European Commission, 2014)

Scenario	Gross value added by persons with access needs in the EU27 countries		Gross value added by persons with access needs from the 11 key international inbound markets	
	€ Million	Percent	€ Million	Percent
Baseline	149,947	-	6,897	-
A (minimum)	176,943	18.0%	8,888	28.9%
B (medium)	186,696	24.5%	10,574	53.3%
C (extensive)	204,073	36.1%	12,048	74.7%

Note. Gross value added is the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector.

Table 22. Labour productivity growth in the business sector in Canada (average annual basis) (Statistics Canada, 2019b)

Type	1980 to 2000	2000 to 2010	2010 to 2017	2017
Gross domestic product growth	3.2	1.5	2.4	3.7
Growth in hours worked	1.5	0.7	1.1	1.4
Labour productivity growth	1.7	0.7	1.3	2.2

Note. Growth rates represent annual compound growth rates. Numbers may not add up due to rounding.

Table 23. Cost of income disability assistance in Canada, 2013 (Metcalf Foundation, 2015)

System[1]	Estimated benefit expenditure[2]	Estimated administration cost (%)[3]
CPPD (F)	$4.0 B	15%
QPPD (P)	$0.8 B	15%
EI sickness (F)	$1.3 B	15%
Veterans disability pension and award (F)	$2 B	20%
Private disability insurance (Pr)	$6.7 B	15%
Workers compensation (E)	$5.4 B	25%
Social assistance benefit for a person with disabilities (P)	$9.0 B	15%
Disability tax measure (F)	$2.5 B	15%
Total	**$31.7 B**	

[1] F: Federal, P: Provincial, Pr: Private, E: Employer.
[2] Values are in 2013 Canadian dollars.
[3] Percentages proposed for administrative costs are preliminary.

Table 24. Median before-tax income of persons (65 years and over) with and without disabilities (CSD, 2017)

Persons without disabilities		Persons with disabilities			
Men	Women	Men		Women	
		Milder	More severe	Milder	More severe
$37,723	$24,570	$34,023	$29,144	$23,802	$19,805

Table 25. Estimation of economic benefits to the public sector

Domains	Federal	Provincial
Tax revenue		
Output and productivity of persons with disabilities (income tax)	35.9%[1]×(60%)[2]	35.9%[1]×(40%)[2]
Fringe/payroll benefit of persons with disabilities (payroll tax)	2.08%[3]	0
General productivity growth (income tax)	35.9%[1]×(60%)[2]	35.9%[1]×(40%)[2]
Tourism and market multiplier effects (sale tax)	5%[4]	8%[4]
Tourism and market multiplier effects (income tax)	(100%-13%)[4]× 25%[5]×35.9%[1]×(60%)[2]	(100%-13%)[4] ×25%[5]×35.9%[1]×(40%)[2]
Tourism and market multiplier effects (corporate tax)	(1-13%)[4]× 8.9%[6]×15%[7]	(1-13%)[4]× 8.9%[6]×11.7%[7]
Averted expenses		
Healthcare expenses	5%[8]	65%[8]
Social safety net programs	31%[9]	31%[9]
Human right complaint	Federal claim cases × cost per case	Provincial claim cases× cost per case

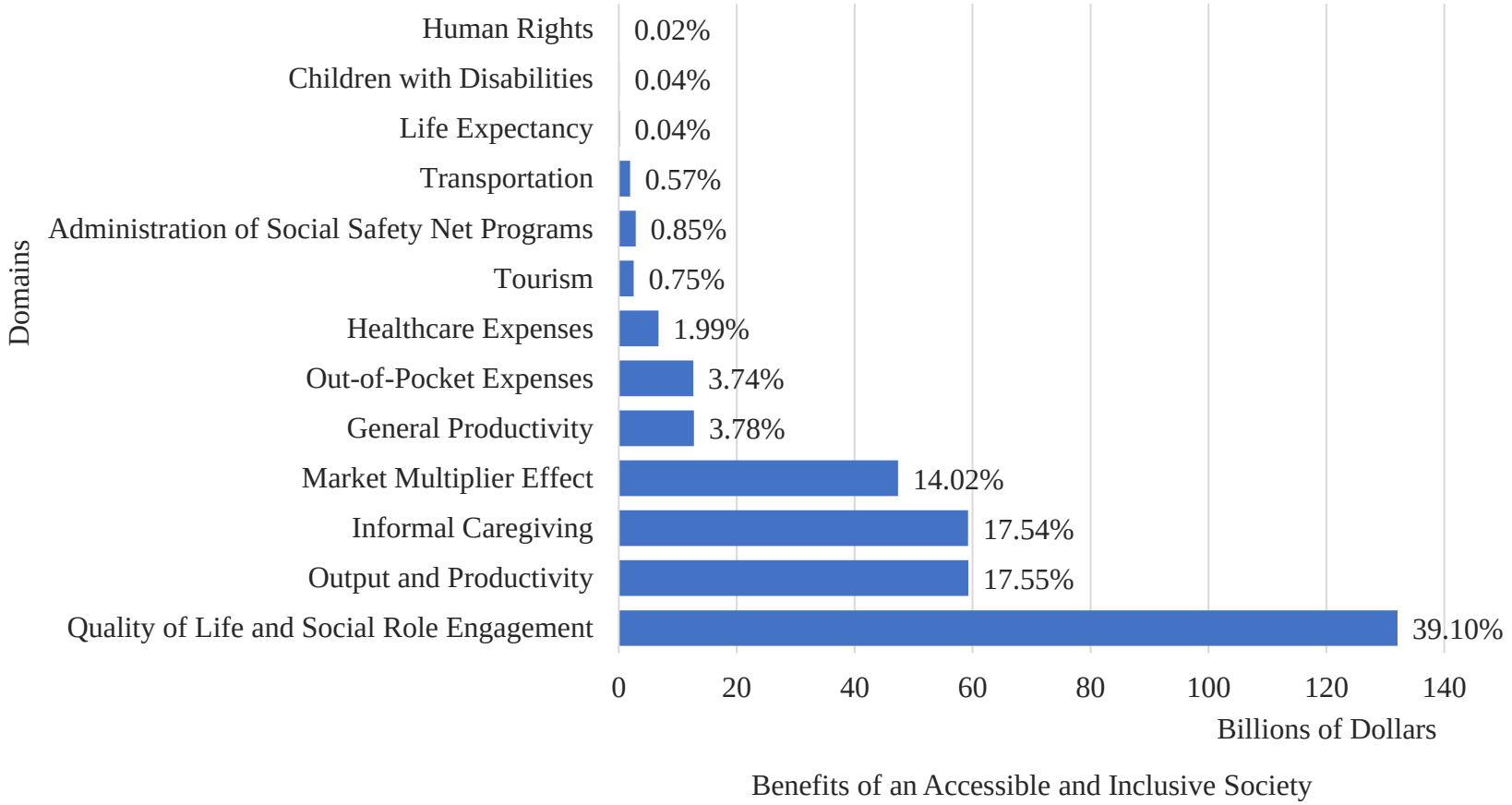
[1] OECD. 2017. Tax on personal income. Available at: https://data.oecd.org/tax/tax-on-payroll.htm#indicator-chart.
[2] This percentage is used to estimate share of federal and provincial governments and is estimated using aggregated ratios of the federal and provincial taxes. Statistics Canada, 2017c. Available at: https://data.oecd.org/tax/tax-on-payroll.htm#indicator-chart
[3] OECD. 2017. Tax on payroll, Available at: https://data.oecd.org/tax/tax-on-payroll.htm#indicator-chart
[4] Sales tax calculator GST / PST or HST. 2018. Available at: http://www.calculconversion.com/sales-tax-calculator-hst-gst.html
[5] Average payroll expenses estimated as 25% of the gross sales revenues (i.e., after-sales tax revenue). Available at: https://yourbusiness.azcentral.com/typical-percentage-payroll-corporaton-29466.html
[6] Average profit across all industrial sectors estimated by dividing the aggregated net profit over operating revenue that we extracted from Table 33-10-0007-01 quarterly balance sheet and income statement. Statistics Canada, 2017d. Available at: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3310000701
[7] Corporate Income Tax Rates. 2018. Available at: https://www.cchwebsites.com/content/pdf/quickcharts/ca/en/business/269qb.pdf; and trading economic. 2017. Available at: https://tradingeconomics.com/canada/corporate-tax-rate.
[8] CIHI. National Health Expenditure Trends, 1975 to 2017. Available at: https://secure.cihi.ca/free_products/nhex2017-trends-report-en.pdf
[9] Metcalf Foundation. 2015. Available at: https://www.crwdp.ca/en/informing-roadmap-work-disability-policy-canada. The federal and province shares do not add-up to 100% as the rest is the private sector share.

Annex 2: Results Tables

Table 26. Total economic benefit of an accessible and inclusive society

Benefit type	Sex	Prevalence of disability	Healthcare expenses	Output and productivity	Quality of life and social role engagement	Spillover effects	Market multiplier effects	Total benefits
Total	Men	2,763,540	$8.6 B	$35.3 B	$57.1 B	$34.7 B	$20.9 B	$156.6 B
Percent			5%	23%	36%	22%	13%	100%
Per case			$3,100	$12,769	$20,673	$12,539	$7,578	$56,660
Total	Women	3,483,090	$10.8 B	$26.9 B	$75.0 B	$42.0 B	$26.4 B	$181.1 B
Percent			6%	15%	41%	23%	15%	100%
Per case			$3,100	$7,726	$21,540	$12,062	$7,578	$52,007
Total	Both	6,246,630	$19.4 B	$62.2 B	$132.2 B	$76.7 B	$47.3 B	$337.7 B
Percent			6%	18%	39%	23%	14%	100%
Per case			$3,100	$9,957	$21,156	$12,273	$7,578	$54,066
Percent of GDP			1.0%	3.2%	6.9%	4.0%	2.5%	17.6%

Figure 4. Economic benefit by domain of an accessible and inclusive society



**Note that in this figure, the benefit of domains of pension is not illustrated, as the impact of this domain is estimated only through market multiplier effects. For more detail in this regard reader are referred to domain of pension.*

Table 27. Averted healthcare expenses

Benefit type	Sex	Prevalence of disability	Healthcare expenses associated with poor health	Healthcare program administrative expenses	Out-of-pocket expenses	Total healthcare expenses
Total	Men	2,763,540	$2.6 B	$0.3 B	$5.6 B	$8.6 B
Percent			31%	4%	65%	100%
Per case			$958	$119	$2,024	$3,100
Total	Women	3,483,090	$3.3 B	$0.4 B	$7.0 B	$10.8 B
Percent			31%	4%	65%	100%
Per case			$958	$119	$2,024	$3,100
Total	Both	6,246,630	$6.0 B	$0.7 B	$12.6 B	$19.4 B
Percent			31%	4%	65%	100%
Per case			$958	$119	$2,024	$3,100
Percent of GDP			0.3%	0.0%	0.7%	1.0%

Table 28. Output and productivity impacts

Benefit type	Sex	Prevalence of disability	Output and productivity impacts from labour income	Fringe/ payroll benefit	Administration cost of social safety net Programs	Output and productivity impacts from longer life expectancy	Total output and productivity impact
Total	Men	2,763,540	$29.8 B	$4.2 B	$1.3 B	$0.0 B	$35.3 B
Percent			84%	12%	4%	0.1%	100%
Per case			$10,789	$1,511	$461	$528,120	$12,769
Total	Women	3,483,090	$22.2 B	$3.1 B	$1.6 B	$0.0 B	$26.9 B
Percent			82%	12%	6%	0.1%	100%
Per case			$6,370	$892	$461	$343,980	$7,726
Total	Both	6,246,630	$52.0 B	$7.3 B	$2.9 B	$0.04 B	$62.2 B
Percent			84%	12%	5%	0.1%	100%
Per case			$8,325	$1,166	$461	$6	$9,957
Percent of GDP			2.7%	0.4%	0.1%	0.002%	3.2%

Table 29. Quality of life and social role engagement impacts

Benefit type	Sex	Prevalence of disability	Quality of life and social role engagement	Monetary value of quality of life and social role engagement at $100,000 per QALY	QALY benefit from longer life expectancy	Monetary value of QALY benefit from longer life expectancy at $100,000 per QALY	Total quality of life and social role engagement improvements	Total monetary value of quality of life and social role engagement improvements
Total	Men	2,763,540	570,772	$57.1 B	545	$0.1 B	571,317	$57.1 B
Percent				99.90%		0.10%		43%
Per case			0.21	$20,654	0.0002	$20	0.21	$20,673
Total	Women	3,483,090	749,721	$75.0 B	527	$0.1 B	750,248	$75.0 B
Percent				99.93%		0.07%		57%
Per case			0.22	$21,525	0.0002	$15	0.22	$21,540
Total	Both	6,246,630	1,320,493	$132.0 B	1,072	$0.1 B	1,321,565	$132.2 B
Percent				99.92%		0.08%		100%
Per case			0.21	$21,139	0.0002	$17	0.21	$21,156
Percent of GDP				6.87%		0.01%		6.9%

Table 30. Spillover effects

Benefit type	Sex	Prevalence of disability	Informal caregiving	Children with disabilities	Human rights	Transportation	Tourism	General productivity	Total spillover effects
Total	Men	2,763,540	$26.2 B	$0.1 B	$0.0 B	$0.9 B	$1.1 B	$6.4 B	$34.7 B
Percent			76%	0.2%	0.1%	2%	3%	18%	100%
Per case			$9,484	$20	$13	$309	$404	$2,309	$12,539
Total	Women	3,483,090	$33.0 B	$0.1 B	$0.0 B	$1.1 B	$1.4 B	$6.4 B	$42.0 B
Percent			79%	0.2%	0.1%	3%	3%	15%	100%
Per case			$9,484	$20	$13	$309	$404	$1,832	$12,062
Total	Both	6,246,630	$59.2 B	$0.12 B	$0.08 B	$1.9 B	$2.5 B	$12.8 B	$76.7 B
Percent			77%	0.2%	0.1%	3%	3%	17%	100%
Per case			$9,484	$20	$13	$309	$404	$2,043	$12,273
Percent of GDP			3.1%	0.01%	0.00%	0.1%	0.13%	0.7%	4.0%

Table 31. Net market multiplier effects[1]

Source of multiplier effects	Core impact	Market multiplier effects	Net effects	Percent
Increased labour-market earnings of persons with disabilities	$59.3 B	$93.4 B	$34.1 B	72.0%
Increased pensions of persons with disabilities	$7.8 B	$12.2 B	$4.5 B	9.4%
Increased labour-market earnings of the entire labour-force (general productivity)	$12.8 B	$20.1 B	$7.3 B	15.5%
Increased earnings of international tourism	$2.5 B	$4.0 B	$1.5 B	3.1%
Increased labour-market earnings due to increase of life expectancy of persons with learning disabilities	$0.02 B	$0.04 B	$0.01 B	0.03%
Sum/Net effects	$82.4 B	$129.7 B	$47.3 B	100%

[1] Net benefit of the market multiplier effects are estimated as the difference between market multiplier effects and the core impact.

Table 32. Range of parameters considered for sensitivity analysis

Domain	Descriptions of scenario	Input parameters range			Benefit range			
					% of the GDP		Dollars	
		Baseline value	Lower bound value	Upper bound value	Lower bound value	Upper bound value	Lower bound value	Upper bound value
Healthcare Expenses	Averted healthcare expenses	Baseline[1]	Lower[2]	Higher[3]	17.2%	17.9%	331 B	344 B
Out-of-Pocket Expenses	Averted out-of-pocket expenses	50%	20%	80%	17.2%	18.0%	330 B	345 B
Output and Productivity	Output and productivity impacts	Full leveling up[4]	Partial leveling up[5]	Full leveling up[4]	15.0%	17.6%	288 B	338 B
Quality of Life and Social Role Engagement	Monetary values of a QALY	$100,000	$50,000	$150,000	13.1%	22.0%	253 B	423 B
Life Expectancy	Increased life expectancy (years)	14	10	18	17.6%	17.6%	338 B	338 B
Informal Caregiving	Informal caregiving impacts	Baseline [6]	Lower [7]	Upper [8]	16.5%	20.3%	316 B	391 B
Children with Disabilities	Averted out-of-pocket expenses of families with children with disabilities	50%	20%	80%	17.6%	17.6%	338 B	338 B
Pensions	Median before-tax income of persons with disabilities age 65+	Full leveling up[9]	Partial leveling up[10]	Full Leveling up[9]	17.5%	17.8%	336 B	338 B
Human Rights	Cost of disability-related discrimination complaints (per case)	$4,623	$2,312	$11,559	17.5%	17.6%	338 B	338 B
Transportation	Reduction in economic and social costs of motor vehicle collisions	5%	1%	10%	17.5%	17.7%	337 B	339 B
Tourism	Growth in tourism	28.9%	14.5%	57.8%	17.6%	17.6%	336 B	342 B
General Productivity	Increase in general productivity	0.75%	0.5%	1%	16.9%	18.2%	335 B	366 B
Administration of Social Safety Net Programs	Averted costs in the administration of social safety net programs	50%	20%	80%	17.5%	17.6%	336 B	339 B
Market Multiplier Effects	Market multiplier values	1.57	1.42	1.73	17.4%	19.0%	325 B	351 B

[1] Baseline: Healthcare expenses for persons with disabilities that are associated with poverty are similar to healthcare expenses for person without disability.

[2] Lower bound: 5% of incremental healthcare expenses of persons with disabilities, relative to expenses of persons without disabilities, are averted
[3] Upper bound: 20% of incremental healthcare expenses of persons with disabilities, relative to expenses of persons without disabilities, are averted.
[4] Full leveling up: Labour-market income of persons with disabilities is the same as the average of the society.
[5] Partial leveling up: Labour-market income of persons with severe disabilities will become equivalent to that of persons with milder disabilities and that of persons with milder disabilities will become equivalent of person without disabilities.
[6] Baseline: Value of unpaid caregiving services are 50% lower, no output and productivity losses associated with caregiving, HRQOL losses for informal caregivers is 50% lower.
[7] Lower bound: Value of unpaid caregiving services is 30% lower, no output and productivity losses associated with caregiving, HRQOL losses for informal caregivers is 30% lower.
[8] Upper bound: No unpaid caregiving services, no output and productivity losses associated with caregiving, no HRQOL losses for informal caregivers.
[9] Full leveling up: Before-tax median total income of persons with disabilities is the same as person without disabilities.
[10] Partial leveling up: Before-tax median total income of persons with severe disabilities will become equivalent to persons with milder disabilities, and the income of those with milder disabilities will become equivalent to that of persons without disabilities.

Figure 5. Tornado diagram presentation of input parameter sensitivity analysis (% of the GDP)

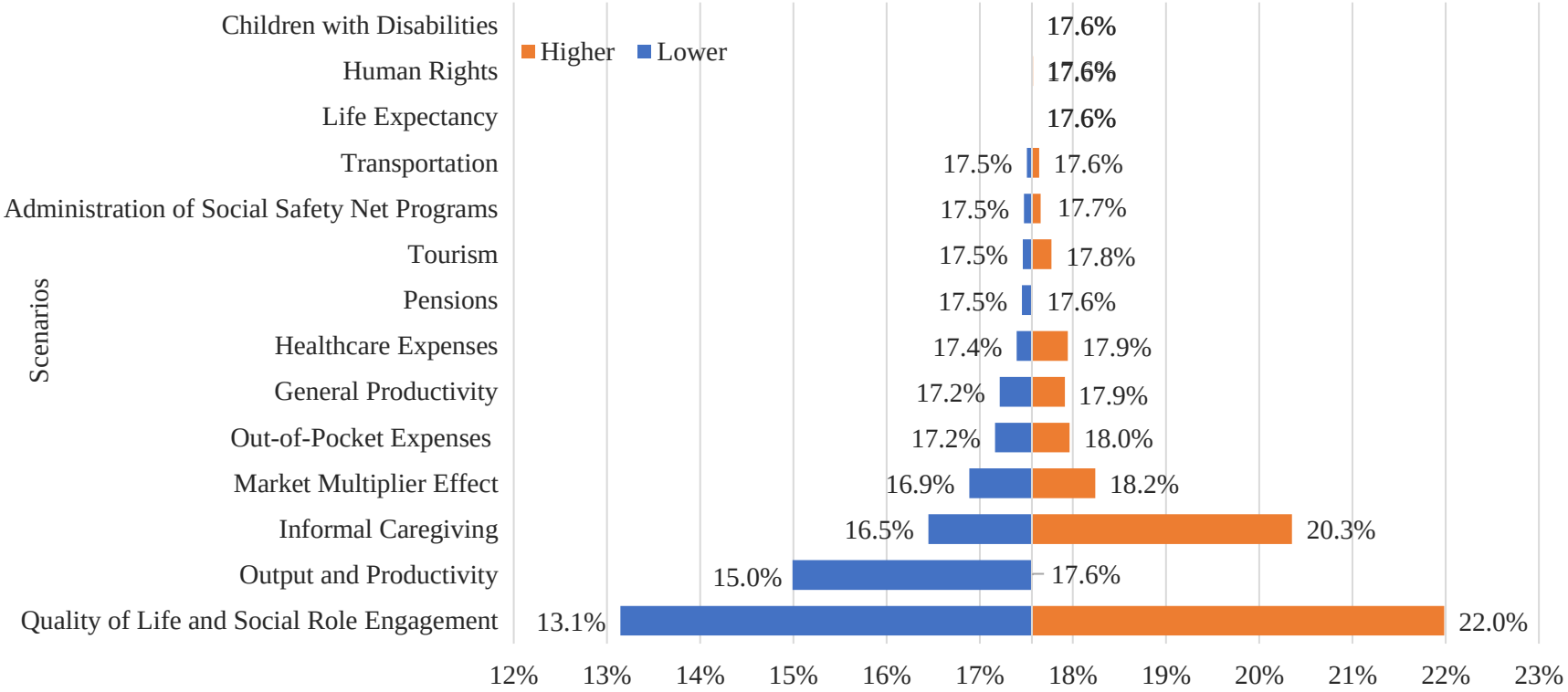


Table 33. Public sector revenues

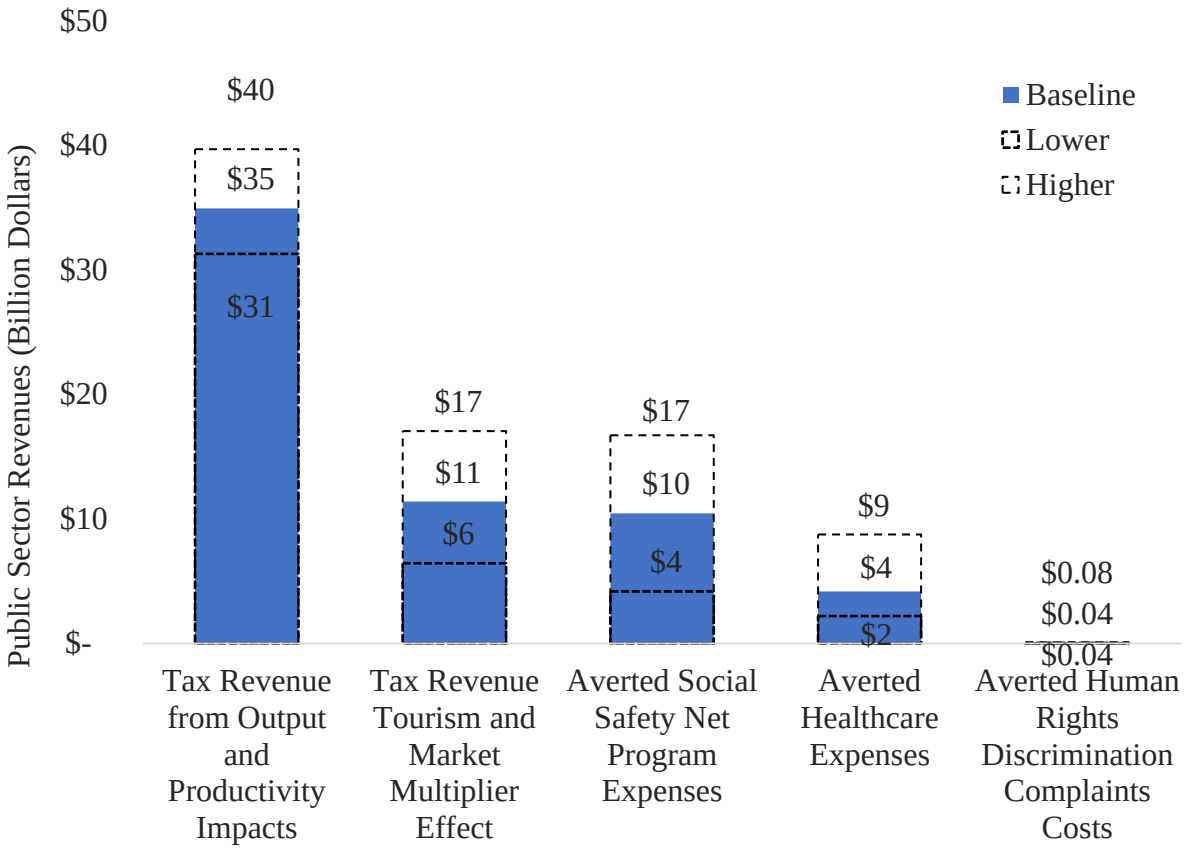
Type of benefit	Federal	Provincial	Federal and provincial	
			Dollar	Percent
Tax revenue from output and productivity impacts	$17.0 B	$18.0 B	$34.9 B	57%
Tax revenue from tourism and the market multiplier effects	$5.4 B	$6.0 B	$11.4 B	19%
Averted healthcare expenses	$0.3 B	$3.9 B	$4.2 B	7%
Averted social safety net programs expenses	$5.2 B	$5.2 B	$10.5 B	17%
Averted human rights discrimination complaints costs	$0.001 B	$0.04 B	$0.04 B	0.1%
Sum	$27.9 B	$33.1 B	$61.0 B	100%

Table 34. Sensitivity analysis of public sector revenues

Parameter	Baseline value	Lower bound value	Upper bound value
Personal income tax[1]	35.9%	35.0%	37.7%
Sale tax (on goods and services)[2]	13.0%	11.1%	15.0%
Corporate tax[3,4]	26.7%	25.0%	31.0%
Percentage of payroll over gross benefit[5]	25.0%	15.0%	30.0%
Average gross benefit of industries[6]	8.8%	7.8%	9.6%

[1] OECD Data. 2019. Available at: https://data.oecd.org/tax/tax-on-payroll.htm#indicator-chart
[2] Harmonized sales tax calculator GST / PST or HST. Available at: http://www.calculconversion.com/sales-tax-calculator-hst-gst.html
[3] https://www.fin.gc.ca/n17/data/17-097_3-eng.pdf; https://tradingeconomics.com/canada/corporate-tax-rate;
[4] https://www.cchwebsites.com/content/pdf/quickcharts/ca/en/business/269qb.pdf
[5] https://yourbusiness.azcentral.com/typical-percentage-payroll-corporaton-29466.html
[6] Statistic Canada, Quarterly balance sheet and income statement, 2017. Available at: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3310000701

Figure 6. Categories of public sector revenues



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