OFFICE OF THE
PARLIAMENTARY
BUDGET OFFICER

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CANADA

Estimate of financial support provided to disabled Veterans under the *New Veterans Charter*

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The mandate of the Parliamentary Budget Officer (PBO) is to provide independent analysis to Parliament on the state of the nation's finances, the Government's estimates and trends in the Canadian economy; and, upon request from a committee or parliamentarian, to estimate the financial cost of any proposal for matters over which Parliament has jurisdiction.

Parliament's responsibilities include debating whether and how the Canadian Forces should participate in peacekeeping and combat missions. From a financial perspective, most attention is paid to the cost of sustaining a mission; not as much attention is paid to post-mission costs, such as meeting Canada's obligation to care for disabled Veterans and their families.

This report aims to help parliamentarians understand the complete cost of military missions by providing an estimate of financial support to future disabled Veterans.

PBO wishes to acknowledge officials from Veterans Affairs Canada (VAC), and the Office of the Veterans Ombudsman (OVO) who provided data, tools and supporting documentation.

This report was prepared by the staff of the Parliamentary Budget Officer. Carleigh Malanik and Erin Barkel wrote the report. Rod Story and Duncan MacDonald contributed to the analysis. Mostafa Askari and Peter Weltman provided comments. Patricia Brown and Jocelyne Scrim assisted with the preparation of the report for publication. Please contact pbo-dpb@parl.gc.ca for further information.

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Executive Summary

The cost of a combat mission continues beyond the point at which the Canadian Armed Forces have withdrawn from the operational theatre. Arguably the most important post-combat cost is that of caring for Canada's ill and injured Veterans.

The aim of this analysis is to better inform parliamentarians of the complete cost of military missions. It projects costs for providing financial benefits to eligible disabled Veterans under the *New Veterans Charter* over the next 10 years. It also provides a 10-year projection of incremental costs as a result of recent changes to the *New Veterans Charter*, as well as a 10-year projection of the incremental costs of post-mission benefits provided to Afghanistan Veterans.

The key results are:

- The House of Commons approved a number of enhancements to benefits provided to Veterans under the *New Veterans Charter* (NVC), as part of the *Economic Action Plan 2015 Act, No. 1* (C-59). PBO estimates the new post-65 Retirement Income Security Benefit (RISB) and the higher Earnings Loss Benefit (ELB) income threshold for part-time reservists will increase VAC's program expenditures by $231.6 million over 10 years. That means the total cost of providing financial benefits for disabled Veterans, including these two enhancements, is estimated at nearly $3.3 billion over the next 10 years.
- For the period between 2015 and 2025, PBO estimates the cost of providing financial support to Veterans who served in Afghanistan at $157.0 million.
    - Estimates reflect a noticeable lag between the date of exposure and the first benefit payment. Lags can be the result of rehabilitation (that is, an attempt to return to service), a delay in the onset of injury (as seen with some mental illness), application delays, or a combination of these factors.
- PBO estimates the cost to provide Veterans disability benefits as a result of a single year of military operations similar to those experienced in Afghanistan would be $145.2 million over the following nine-year period. This includes the Retirement Income Security Benefit (RISB) and part-time reservist Earnings Loss Benefit (ELB) income threshold increase. However, the costs would continue to accumulate for decades, albeit at a declining rate.

Summary Table 1 Estimated Annual Financial Benefits for Disabled Veterans under the NVC

$ Millions

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Baseline	220.4	229.2	229.9	246.3	262.2	273.2	284.6	299.5	313.6	327.3	340.2	**3,026.4**
Enhancements*	8.9	10.2	11.3	13.4	15.9	18.8	21.9	25.5	30.0	35.0	40.6	**231.6**
Total	**229.3**	**239.4**	**241.3**	**259.7**	**278.1**	**292.0**	**306.5**	**325.1**	**343.6**	**362.2**	**380.8**	**3,258.0**
Afghanistan**	15.9	14.9	14.3	14.0	13.8	13.3	13.2	13.7	14.2	14.6	14.9	**157.0**
Mental Health**	154.4	163.6	168.0	181.7	195.1	205.6	216.2	229.1	241.3	253.3	264.7	**2,272.9**
PTSD**	106.3	112.4	115.0	124.3	133.2	140.2	147.3	156.3	164.8	173.1	181.2	**1,554.0**
Musculoskeletal**	157.8	164.0	164.8	176.6	188.1	195.7	204.0	214.6	224.7	234.3	243.2	**2,167.8**

* Includes the Retirement Income Security Benefit (RISB) and the new ELB-income threshold for part-time reservists

** The total is less than the sum of the individual parts because some Veterans have co-morbidities, and their benefits are counted in multiple categories.

Source: PBO Analysis

- Demographics and morbidities are important drivers of PBO's estimates. Afghanistan Veterans are three times more likely to have a mental health diagnosis, but make-up only 18 per cent of disabled Veterans. This group is 20 years younger than those without Afghanistan service (with an average age of 41 v. 61) and will continue to collect benefits while pension earnings will offset the others' benefits. As a result, benefits paid to Veterans with mental health conditions will exceed those of Veterans with musculoskeletal conditions by 2017 (see Summary Table 1).
- PBO was unable to estimate the cost of providing health care, pharmacare and rehabilitation services to Veterans due to data and methodological constraints. Examining these costs is especially relevant when examining the cost of caring for Veterans living with mental illness. Studies indicate that these Veterans typically require greater and increasing resources over time, in contrast with their peers whose use of resources declines over time.[1]

1. Introduction

In the fall of 2013, PBO assessed the feasibility of estimating the cost of providing care to Veterans experiencing mental health problems. Through information requests and discussions with subject matter experts, PBO learned that the data required for this work would be difficult, if not impossible, to acquire.

PBO was fortunate to receive guidance from knowledgeable staff at Veterans Affairs Canada (VAC) and the Office of the Veterans Ombudsman (OVO). In consideration of the information shared through these discussions, PBO opted to pursue an approach that would leverage existing tools and readily available data.

VAC has a large administrative data set, designed to support the department's operations. The system is not intended to support research. But it can provide a complete "snapshot" of the population of Veterans living with disabilities at a point in time.

In contrast, the Office of the Veterans Ombudsman developed a model for their report *Improving the New Veterans Charter: the Actuarial Analysis*. It estimates the lifetime cost of caring for a single Veteran by using a number of actuarial factors, such as age, gender and marital status. This model provided a powerful tool for estimating cost, but required population data to generate an estimate of program expenditures.

Thus, PBO began an effort to integrate VAC population data into the OVO model. The result is an estimate of the cost of providing financial support to Canada's injured Veterans and their families. PBO also uses this tool to illustrate how an engagement similar to Canada's mission in Afghanistan could change these projections.

The intent of this analysis is to ensure that these costs come as no surprise to parliamentarians, and to inform future debates pertaining to the role of the Canadian Armed Forces.

1.1. Veterans benefits in Canada

Veterans Affairs Canada (VAC) is mandated under the *Department of Veterans Affairs Act* to provide care, treatment and re-establishment in civil life for Canadian Armed Forces (CAF) Veterans and their families.

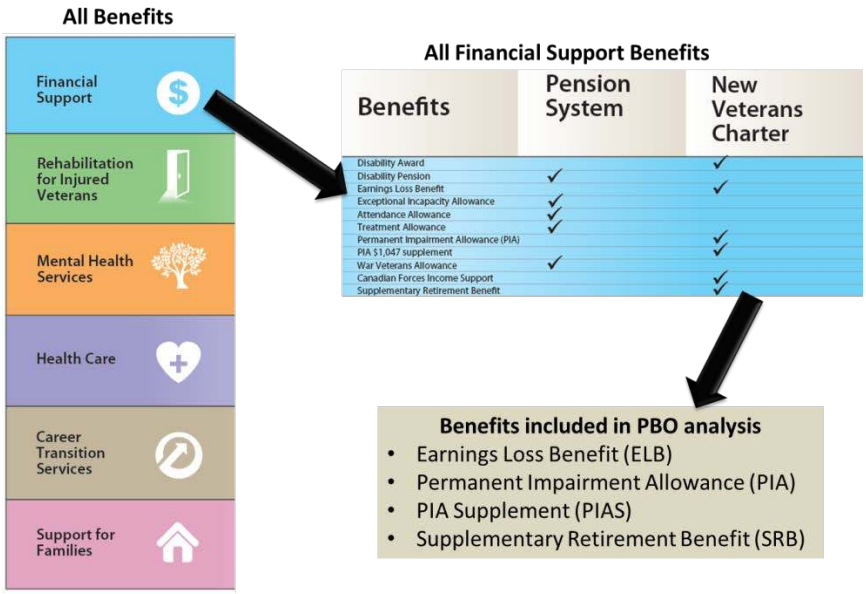
Since April 1, 2006, benefits and services for disabled Veterans and their families have been provided through the framework established in *The*

Canadian Forces Members and Veterans Re-establishment and Compensation Act, more commonly known as the *New Veterans Charter* (NVC).

In this report, PBO estimates the cost of providing financial benefits to these Veterans. In 2015-2016, VAC plans to direct $214 million of its $3.5-billion appropriations towards the financial support of disabled Veterans via the NVC.

While many financial benefits are offered to CAF Veterans only Earnings Loss Benefits (ELB), Permanent Impairment Allowance (PIA), and Supplementary Retirement Benefit (SRB) costs are included in PBO's analysis of financial benefits (see Figure 1-1). These expenses are reported by VAC; however, they are not disaggregated into separate sub-population estimates, as provided by PBO.[2]

Figure 1-1 Benefits included in PBO analysis

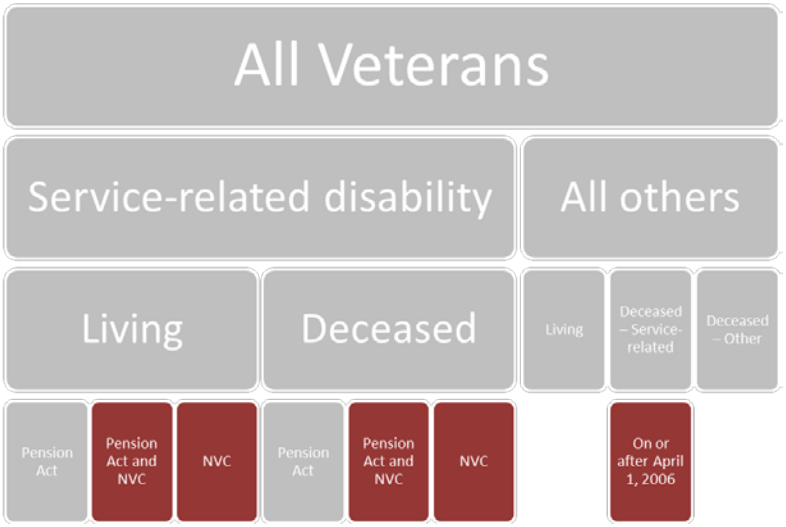


Source: PBO/VAC graphic

This report provides a disaggregated estimate of financial benefits provided to disabled Veterans under the NVC.

Recipients of these benefits include Veterans who have a service-related disability, or survivors of Veterans who lost their lives while serving on a mission, on or after April 1, 2006 (see Figure 1-2). PBO did not include the cost of the benefits paid to survivors.

Figure 1-2 Veterans included in PBO analysis



PBO analysis included those groups highlighted in red.

Source: PBO graphic

Box 1-1 – Description of NVC benefits

These are brief descriptions of the benefits included in PBO's analysis. See Appendix A for further discussion of benefits and eligibility criteria.

Earnings Loss Benefit (ELB)

- Monthly payment payable while in rehabilitation (PBO assumes a maximum of two years), paid in recognition of career-ending disability (that is, temporary ELB). ELB is the primary source of income for recipients who are undergoing rehabilitation therapies.
- If the Veteran is totally and permanently incapacitated, payments can continue until the age of 65 (extended ELB).

Permanent Impairment Allowance (PIA)

- Monthly payment in recognition of permanent and severe impairment. PIA is an income "top-up" for Veterans with permanent disabilities which hinder their earning potential.

Supplementary Retirement Benefit (SRB)

- Benefit paid when a Veteran's income is too high to receive ELB. Payment is a top-up equal to 2 per cent of total ELB.

1.2. About the NVC enhancements

The *New Veterans Charter* (NVC) was passed in 2005 and came into force on April 1, 2006. The Act was amended in March 2011 (*Enhanced New Veterans Charter Act*) to adjust some of the eligibility criteria and the method of disbursement for certain benefits.

In 2013, it was further revised to end the offset of the disability pension when calculating ELB.[3]

The Office of the Veterans Ombudsman (OVO) conducted analysis comparing the NVC to the *Pension Act* which brought to light significant differences between the lifetime benefits of certain groups of Veterans.[4] As a result of these findings, the Standing Committee on Veterans Affairs undertook a study, resulting in a series of recommendations that the NVC be enhanced.[5]

In 2015, the federal government announced a number of changes to VAC benefits. PBO was only able to estimate the cost of two of the four pertinent enhancements described below (see Table 1-1). Specifically, this report includes estimates of the enhancements to the Retirement Income Security and the Benefits for Reservists. Insufficient data regarding eligibility criteria prevented PBO from estimating the impact of the Broadened PIA Eligibility Criteria and the Family Caregiver Relief Benefit (see Appendix E).

Table 1-1 NVC enhancements

Enhancement	Description
Retirement Income Security	Provide moderately to severely disabled Veterans continued assistance in the form of a monthly income support payment beginning at age 65.
Enhanced Benefits for part-time Reserved Forces	Increase minimum income support payment through the Earnings Loss Benefit to same as full-time Reserve Force and Regular Force Veterans.
Broadened PIA Eligibility Criteria	Increase number of Veterans who are eligible for PIA Supplement, which provides between $600 and $2,800 per month in financial support to Veterans whose employment potential and career advancement opportunities have been limited by a permanent service-related injury or illness.
Family Caregiver Relief Benefit	Provide eligible Veterans with a tax-free, annual grant of up to $7,238 to enable informal caregivers to have flexibility or relief while also ensuring that the Veterans' care needs are met.

Source: Veterans Affairs Canada News Release, March 19, 2015

2. Methodology

VAC provided PBO with anonymized data inclusive of all Veterans who were currently in receipt of, or who had ever received, an NVC benefit as of September 2013.

To calculate the total cost of financial benefits in 2013, PBO identified disabled Veterans who were in receipt of an NVC financial benefit in September 2013, and those who had died in 2013.[6]

The details for each recipient were entered into an actuarial model provided by the Office of the Veterans Ombudsman (OVO), and the estimated annual financial benefits recorded. This formed the estimate for the base population, from which all cost projections are derived.

The complete methodology for PBO's analysis is provided in Appendix C.

3. Analysis

This section of the report is divided into two parts:

- The impact of the NVC enhancements on future annual expenditures; and
- Estimating the post-mission costs of Afghanistan, and the cost of a hypothetical future conflict similar to Afghanistan.

To begin, PBO presents the total annual costs of NVC financial benefits without adjusting for the recent enhancements, as well as some basic characteristics of the NVC Veterans in receipt of a disability award as of September 2013.

Box 3-1 – Terminology: how we use cohorts and morbidities in this report

For simplicity, this report uses the terms *cohort and morbidity* when comparing the demographic and cost of groups of Veterans.

The term *cohort* is used to describe a group of people with similar characteristics. PBO uses cohorts to compare the cost of groups of Veterans with similar service profiles to other cohorts of Veterans, specifically those with and without Afghanistan service.

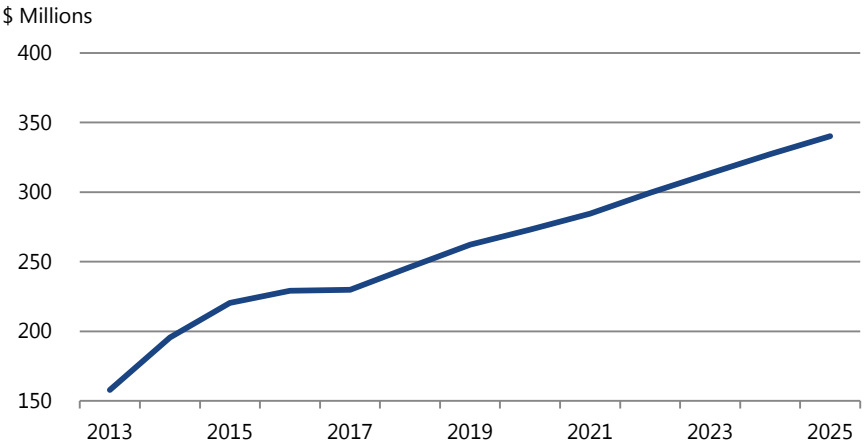
The term *morbidity* is used to describe an illness or medical condition. PBO also analyzed the impacts of three morbidity groupings for this report: 1) musculoskeletal; 2) all mental health; and 3) post-traumatic stress disorder (PTSD).

It is common for a Veteran to have more than one condition, or *comorbidities*. PBO did not isolate the costs of Veterans suffering from a single morbidity. Therefore, when referring to a Veteran suffering from a mental health morbidity, (s)he may or may not also be diagnosed with other ailments

3.1. Cost estimate pre-enhancements

PBO estimates pre-enhancement financial benefits to disabled Veterans will be $220.4 million in 2015, increasing to $340.2 million in 2025. These results are similar to estimates developed by VAC (see Appendix B.2.2). The pre-enhancement projection is illustrated in Figure 3-1.

Figure 3-1 **Pre-enhancement cost estimate**



Source: PBO analysis

Among all disabled Veterans, only 9 per cent are in receipt of at least one NVC financial benefit (see Table 3-1). Among those, the majority are in receipt of temporary ELB.

Table 3-1 Population characteristics (VAC data as at September 2013)

	All	Afghanistan	Non-Afghanistan
Temporary ELB recipients	5%	5%	5%
Extended ELB recipients	2%	1%	2%
Extended ELB eligible*	2%	2%	2%
PIA recipients	3%	3%	3%
PIAS recipients	2%	2%	2%
Any financial benefit recipients	9%	8%	9%
Average Age	58	41	61
Married/Common-Law	62%	55%	63%
Single (or never married)	33%	41%	31%
Gender (percent female)	8%	8%	8%
DA only clients	63%	72%	61%
Dual clients	30%	26%	31%
Average Disability Award Assessment	16%	25%	14%
Average Disability Pension Assessment	11%	6%	12%
Average total disability assessment	27%	31%	26%
Afghanistan service	18%	100%	0%
Mental Health	21%	46%	16%
PTSD	16%	39%	11%
Annual Income**	$ 61,449	$ 65,398	$ 60,583

* Reflects those with income above threshold for ELB payment
** Income statistics only available for some Veterans. Income data is only collected when required to calculate certain benefits. Reflects pre-release, income.

Source: PBO analysis of VAC data

Appendix D provides additional analysis of this base population, including characteristics of financial benefit recipients and average benefits by morbidity, for example, benefits paid to a Veteran living with a mental health illness, and possibly other illnesses or injuries. Appendix D also provides further comparative analysis of the Afghanistan cohort.

3.2. Cost estimate post-enhancements

Retirees

The creation of a post-age 65 benefit will cost $112.8 million from 2015 to 2025.[7] Veterans with little or no pension will benefit the most from this enhancement.

Box 3-2 – Enhanced benefits for Veterans aged 65 and over

Veterans who had served full time would realize an increase to their benefits. A hypothetical 62-year-old Veteran with full-time service eligible for temporary ELB and extended ELB, with a pre-release income of $61,000 would have received an estimated $50,417 from 2015 to 2025. With the enhancements of the ELB and the introduction of the retirement benefit in place, the same Veteran would receive $429,582, an increase of $379,165. This is a significant increase for a small group of Veterans who have little or no pension income because they did not accumulate enough years of pensionable service prior to becoming disabled.

Table 3-2

Enhanced benefits for older Veterans

FT; Age 62; ELB; $61,000; Eligible spouse; 65% disabled; No CPP

Year	Age	FT Status Quo	FT New Benefits	Spouse of FT	Spouse of FT, NB
2013	62	46,665	45,750	46,665	45,750
2014	63	46,665	46,665	46,665	46,665
2015	64	47,598	47,598	47,598	47,598
2016	65	2,819	37,036	2,819	19,918
2017	66	-	35,006	-	17,503
2018	67	-	35,794	-	17,897
2019	68	-	36,599	-	18,300
2020	69	-	37,422	-	18,711
2021	70	-	38,264	-	19,132
2022	71	-	39,125	-	19,563
2023	72	-	40,006	-	20,003
2024	73	-	40,906	-	20,453
2025	74	-	41,826	-	20,913
		50,417	**429,582**	**50,417**	**239,991**

Source: PBO Calculations

This value should not be compared to that of the part-time reservist.

Reservists

Increasing the minimum ELB payments to part-time reservists also increases the average cost per disabled Veteran. Cumulatively, this enhancement will cost an additional $118.8 million from 2015 to 2025.[8]

Box 3-3 – Enhanced benefits for reservists

This enhancement reflects the decision that compensation for disabled Veterans should be calculated independent of their status as a full-time or reservist member of the Forces.

Before the recent enhancements to the NVC, a 32-year-old part-time reservist eligible for both temporary ELB and extended ELB, with a pre-release income of $35,000 would have received an estimated $307,646 from 2015 to 2025. With the changes to the ELB for part-time reservists, and the introduction of the retirement benefit, this same part-time reservist would receive $526,645 over the same period, an increase of $218,999. A survivor of this part-time reservist, if the Veteran were to die, would see his/her benefits increase by roughly the same amount.

Table 3-3

Enhancements to benefits for reservists

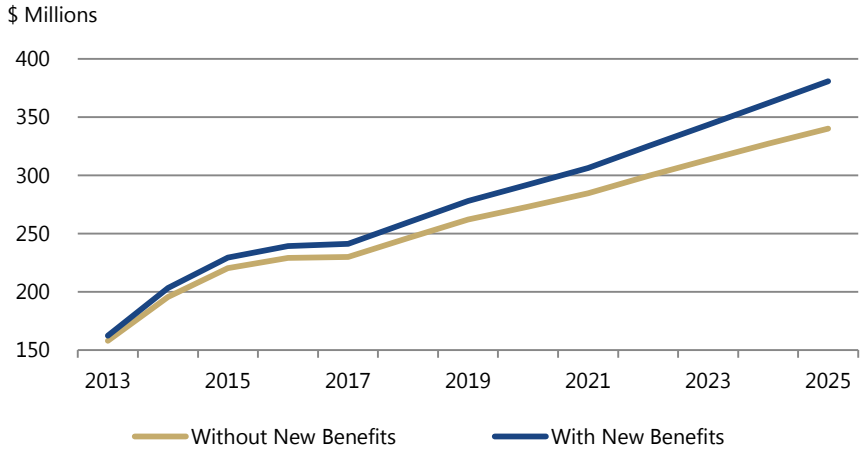
PT Reservist; Age 32; ELB; $35,000/year; Eligible spouse; 65% disabled; No CPP

Age	PT Reservist Status Quo	PT Reservist New Benefits	Spouse of PT Reservist	Spouse of PT Reservist, NB
32	24,786	41,598	24,786	41,598
33	24,786	42,430	24,786	42,430
34	25,282	43,279	25,282	43,279
35	25,787	44,144	25,787	44,144
36	26,303	45,027	26,303	45,027
37	26,829	45,928	26,829	45,928
38	27,366	46,846	27,366	46,846
39	27,913	47,783	27,913	47,783
40	28,471	48,739	28,471	48,739
41	29,041	49,713	29,041	49,713
42	29,622	50,708	29,622	50,708
43	30,214	51,722	30,214	51,722
44	30,818	52,756	30,818	52,756
	307,646	**526,645**	**307,646**	**526,645**

Source: PBO projections derived from VAC data and OVO model
Notes: This value includes inflation adjustments.
Once the Veteran would have reached the age of 65 (in 2046), the survivor's benefits would still be increased, however would be equal to roughly half of their pre-2046 value.

PBO estimates that the combination of these two changes to the NVC will increase VAC spending on financial benefits to disabled Veterans by $231.6 million, cumulatively, over the 2015 to 2025 period. In 2015, total costs including enhancements amount to an estimated $229.3 million. The enhancements add about $8.9 million. By 2025, total costs including the recent enhancements will rise to $380.8 million, or $40.6 million higher than if there were no enhancements (see Figure 3-2).

Figure 3-2 **Projected increase in NVC spend over 10-year horizon**



Source: PBO projections derived from VAC data and OVO model

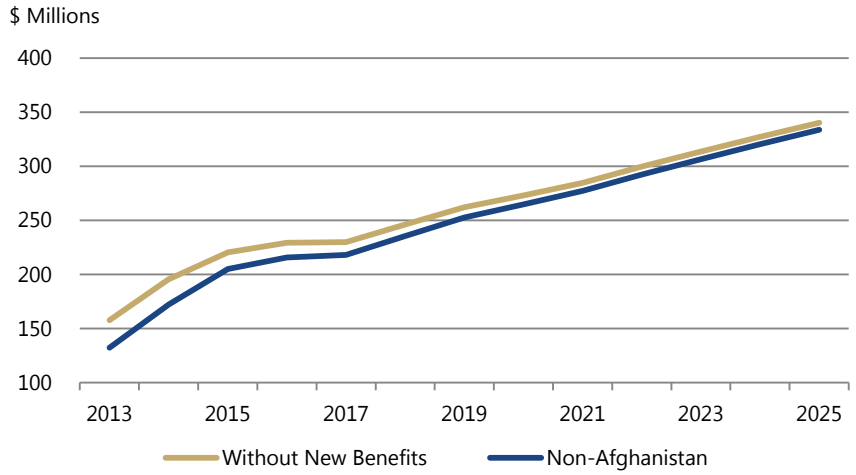
3.3. Estimating historical and future mission costs

Data provided by VAC and the Office of the Chief Actuary (OCA) allowed PBO to estimate the incremental post-mission costs of the Afghanistan cohort from 2013 onward.

PBO assumed that the total number of disabled Veterans would have in fact been much lower than what was observed, and what is currently projected. Since the number of active members of the Forces increased during the Afghanistan years and the risk of injury is typically increased during wartime operations, this assumption is reasonable.

Multiplying the number of non-Afghanistan Veterans by their average costs produces the cost for a scenario in which Canada was in a period of relatively low-operational tempo. It is equivalent to the non-Afghanistan total costs presented in Table D-3 in Appendix D and is represented as the gold line in Figure 3-3.

Figure 3-3 **Cost comparison with and without Afghanistan mission**



Source: PBO analysis of VAC data using OVO model

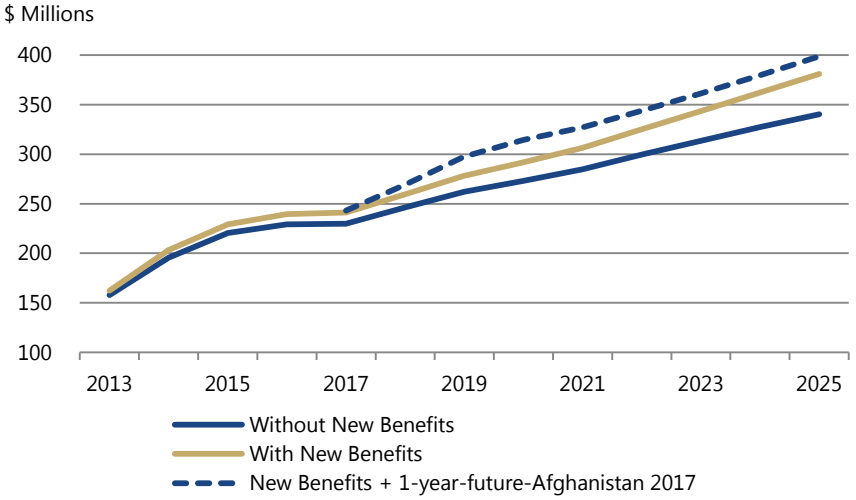
The blue line reflects the status quo estimated costs. Although the adjusted average cost of a non-Afghanistan Veteran is slightly greater than their counterparts with service in Afghanistan, the number of soldiers who then become Veterans increases in a time of high operational tempo.

PBO's estimate of the incremental costs when engaged in Afghanistan is $15.9 million in 2015, decreasing to $14.9 million in 2025. Cumulatively, these additional costs are estimated at $157.0 million, exclusive of NVC enhancements.

These findings draw attention to the important fact that the costs of war extend beyond the Forces' withdrawal from theatre, and beyond the boundaries of DND's budget. Despite Canada's withdrawal from Afghanistan five years ago, VAC's program expenses have continued to increase because of the participation of CAF members and Veterans in the Afghanistan combat mission. While this is a reflection of VAC's mandate to support Veterans, parliamentarians should ensure that these costs are accounted for, and that future discussions of engaging in conflicts consider these additional costs.[9]

PBO also estimates the one-year cost of a conflict that is hypothetically identical to the 2007 operational tempo of Afghanistan (see Figure 3-4). Over the course of nine years (2017-2025), PBO estimates this would cost VAC an additional $145.2 million, inclusive of NVC enhancements. In this scenario, the full impact of the RISB will not be felt until decades later, as the average age of this cohort would preclude them from qualifying for this benefit.

Figure 3-4 **Cost comparison with one-year 2007-Afghanistan-Identical Future Mission**



Source: PBO analysis of VAC data using OVO model

These results show that a single year of conflict can result in additional costs for several years in the future. This is because even after decades, Veterans who had suffered an injury or illness during this conflict are still entering the system.

3.4. Model sensitivity to rehabilitation period

Veterans are eligible for temporary ELB while they are undergoing rehabilitation. They may collect this benefit for two years, or longer if they are participating in a vocational rehabilitation program. Since the anonymized data provided to PBO by VAC was for a single point in time and did not include the duration that individual Veterans were undergoing rehabilitation, PBO's model assumes that all Veterans will spend two years collecting temporary ELB.

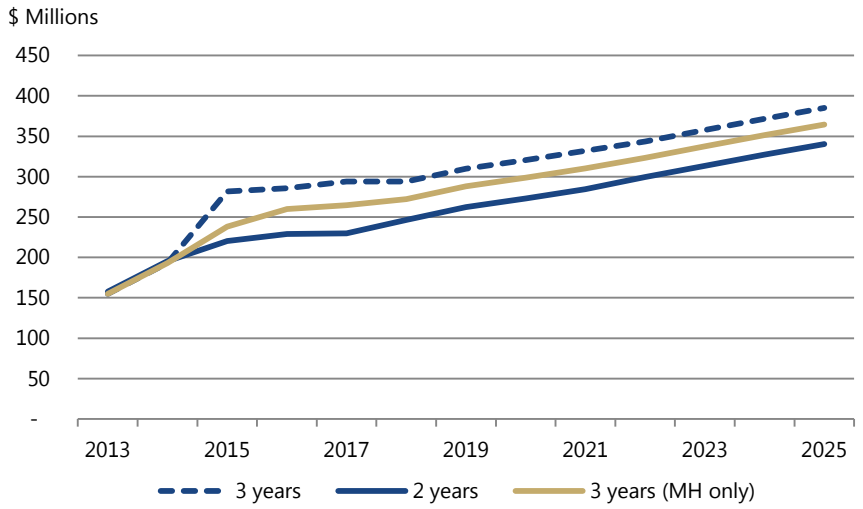
PBO undertook a sensitivity analysis to determine the impact of an increase in rehabilitation duration on the overall cost projections. A one-year increase in the average duration that a Veteran collects temporary ELB, from two to three years, would increase the overall cost by $550.0 million over 10 years (see the dashed line in Figure 3-5, below).

However, the duration that Veterans undergo rehabilitation will vary depending on the type and severity of the individual's disability. Although the PBO could not locate comparable data for Canadian Veterans, the US Congressional Budget Office found that health care and rehabilitation costs for Veterans with PTSD and traumatic brain injuries are greater than those of

their peers and increase, rather than decline, in the third and fourth years of treatment.[10]

For comparative purposes, PBO increased the average rehabilitation time of Veterans with mental health morbidities to three years, leaving the average rehabilitation time of all other eligible Veterans at two years. PBO found that the overall cost would increase by $282.5 million over 10 years (see the dashed line in Figure 3-5, below).

Figure 3-5 Sensitivity to rehabilitation period



Source: PBO analysis of VAC data using OVO model

4. Conclusions

PBO now has the capacity to estimate the 10-year incremental cost of post-mission benefits after a high-tempo operation such as the Afghanistan mission. This will provide parliamentarians with a more complete cost estimate of future military engagements.

However, additional work remains to estimate the cost of providing health care, pharmacare, and rehabilitation services to Veterans. PBO was unable to address all of these costs due to data and methodological restraints.

Further, the current approach makes it impossible to determine how much is spent on the care of a disabled Veteran after he or she is discharged from the Forces, or after the Veteran begins to rely upon the civilian (public) health care system.

This is especially relevant when examining the cost of caring for Veterans living with mental illness. Studies indicate that these Veterans typically require greater resources over time, than do their peers.[11]

Future work could also focus on acquiring the necessary information to challenge the strict assumptions PBO applied in its estimated future conflict costs. This work would provide parliamentarians with a reasonable cost estimate of VAC benefits if future conflicts were to occur.

Appendix A: NVC benefits and recipients

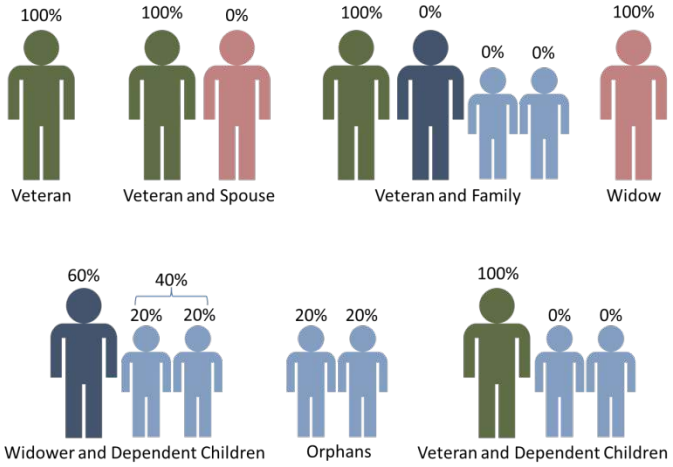
This report examined the cost of providing certain NVC benefits to disabled Veterans. The table below lists the specific benefits accessible to NVC clients and describes whether the benefit can be transferred to eligible survivor(s).

Table A-1 NVC Benefits included in PBO analysis

Benefit	Description	Transferable to eligible survivors
Temporaryand Extended Earnings Loss Benefit (ELB)	Earnings replacement while in rehabilitation that ceases upon return to work, or in the case of a Veteran being totally and permanently incapacitated, earnings replacement until the age of 65. *Pension Act* Veterans are also eligible.	✓
Permanent Impairment Allowance (PIA)	Taxable monthly benefit, payable for life. Recognizes the impact of a condition on career progression. May include a supplement if designated as totally and permanently incapacitated. Must have been approved for rehabilitation to qualify, and must have a permanent and severe impairment, and received a Disability Award.	
Supplementary Retirement Benefit (SRB)	Taxable, lump-sum benefit provided to individuals who were in receipt of ELB on a long-term basis, but no longer qualify. Is also payable if the Veteran was eligible for ELB but for their income level.	✓

Source: PBO collaboration with VAC

Figure A-1 Distribution of ELB and SRB to eligible recipients



Note: PIA and PIA Supplement are not transferrable to survivors. Children of deceased Veterans are generally eligible up to the age of 18.[12]

Source: PBO graphic

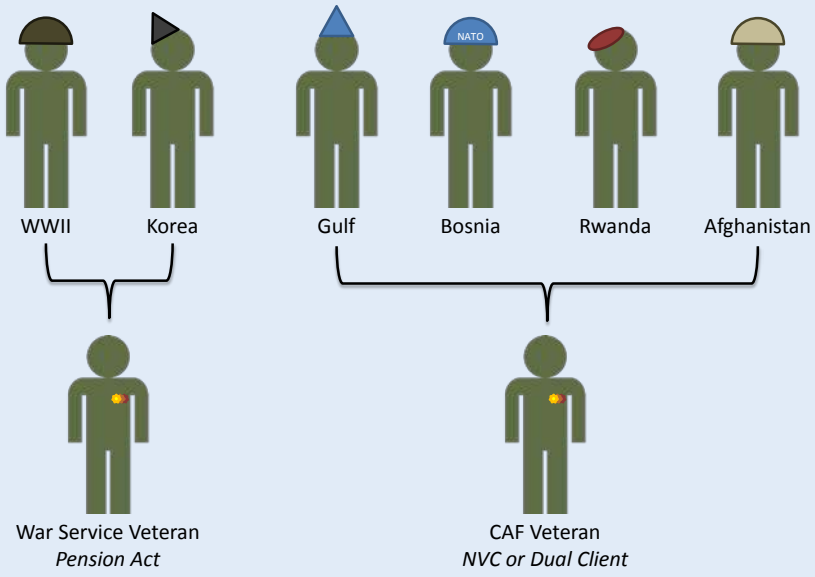
Box A-1 – Dual clients and war service Veterans

Some Veterans are *dual clients*, meaning they are in receipt of both a disability pension (under the *Pension Act*) and a disability award (under the NVC). This can occur when a Veteran's disability condition was assessed and payable under the *Pension Act*, and the Veteran presented with a new condition after April 1, 2006, which was not related to the condition covered by the *Pension Act*. This new or unrelated condition will be covered by the NVC.

The exception to this is the case of War Service Veterans, who are covered under the *Pension Act* regardless of when they present with a new condition. In this regard, the legislation requires VAC to provide different benefits to Veterans based on when they served (see Figure A-2).

Figure A-2

VAC differentiates between war service and CAF Veterans



Note: Not an exhaustive list of CAF missions.

Source: PBO graphic

Under Section 3.1(1)(c) of the Pension Act, eligible War Service Veterans are those with an:

"injury or a disease that was attributable to or was incurred during, or arose out of or was directly connected to, service in the Canadian Forces on or before April 1, 1947, or was attributable to or was incurred during service in the Korean War or is an application under subsection 21(5) in respect of such an injury or a disease"

Appendix B: Data sources

PBO used two key resources to produce the cost estimates: administrative data from VAC, and a model prepared for OVO by AON Hewitt.

B.1 VAC administrative data

VAC provided PBO with anonymized administrative data on clients receiving disability benefits. These clients could be Veterans, Veterans' spouses and/or dependents, or survivors. Data provided were for a single point in time (as of September of 2013), and included deceased Veterans. Information included indicators for various NVC benefits, as well as characteristics informing eligibility criteria, for example, the level of disability assessed.

This information formed the data set PBO used to populate the model provided by OVO.

B.2 OVO actuarial model

The actuarial model is the same used by OVO to produce several reports comparing the *Pension Act* to the NVC, using hypothetical Veteran scenarios. Information about the Veteran is entered in an Excel spreadsheet, and the model calculates the annual payable benefits. The model used the legislated rates of benefits and eligibility criteria to determine the benefits payable to a Veteran.

The model is static in that descriptive information (e.g. marital status) is assumed to remain unchanged throughout the lifetime of the Veteran. The model does, however, check for eligibility criteria. For example, ELB is no longer payable at age 65 in the model, as the legislation prescribes.

The model incorporates the eligibility criteria for select NVC benefits, namely Earnings Loss Benefit (ELB), Supplementary Retirement Benefit (SRB), Permanent Impairment Allowance (PIA) and the PIA supplement (PIAS). It also includes the lump-sum calculation of the death benefit, the disability award (DA) and several Pension Act benefits that lie outside the scope of this report. It also contains several actuarial assumptions such as inflation rates, conditional mortality rates and discount rates.[13]

The model provided annual present value and annual future value estimates.

Box B-1 – Actuarial Science

Investopedia defines Actuarial Science as

A discipline that assesses financial risks in the insurance and finance fields using mathematical and statistical methods. Actuarial science applies the mathematics of probability and statistics to define, analyze and solve the financial implications of uncertain future events. Traditional actuarial science largely revolves around the analysis of mortality and the production of life tables, and the application of compound interest.

Source: *Actuarial Science Definition* on the Investopedia website

PBO adjusted some of the parameters and assumptions, which are explained below. Specifically, since this report is focused on the amounts paid by VAC to clients, and not the after-tax amounts VAC clients receive, PBO changed the taxation rates in the model to 0%.

Additionally, the data did not provide information on either the age of a Veteran's spouse or dependent. Therefore, PBO assumed that the spouse of a male Veteran was three years younger, and a spouse of a female Veteran was three years older than the Veteran.[14]

To determine whether a Veteran had a dependent, PBO assumed that the proportion of single and couple Veterans with dependents was the same as that observed in the general population. To assign a flag indicating a particular Veteran had a dependent, PBO assigned a random value (between 0 and 1, exclusive) to each disabled Veteran.

This was done separately for couple Veterans (that is, married or common-law) and single Veterans (that is, widowed, single, divorced or separated). Then, PBO sorted these Veterans by the random value, and selected the proportion that matched the percentage of the general population with children.[15] See Table B-1 below for the specific proportions applied.

Table B-1 Percentage of Canadian households with children

Household Type	% with children
Couples with children	26.5
Single with children	24.6

Source: PBO analysis of 2011 Census Data[16]

The model assigns all medically discharged Veterans with the Service Income Security Insurance Plan (SISIP), which is a disability benefit paid by the Department of National Defence. It is equivalent in value to that of VAC's ELB. The model was adjusted such that only a Veteran who was in receipt of

earnings loss benefit would have this cost calculated for two years. This two-year assumption is on the lower-end of rehabilitation duration.

The OVO model did not include a mortality adjustment for its annual payment calculations, but did so for a present-value calculation. PBO applied the mortality adjustment calculation to the annual payment calculations to reflect the mortality assumptions. The mortality adjustment reduces the calculated annual payments by multiplying the annual payment by a fraction; this fraction effectively represents the probability that a Veteran will still be alive to receive the benefit. As the Veteran ages, this probability decreases, thus reducing the value of the annual payment.

It is important to note that, for the purpose of this report, this method of mortality adjustment over-estimates the total estimated annual payments. This is because only ELB and SRB are payable to a survivor (PIA and PIAS cease to be paid upon the death of a Veteran).

The actuarial model does calculate the annual payments that would be made to a Veteran, spouse/survivor, and child/survivor (that is, ELB and SRB). However, the model uses a mortality adjustment to account for the predicted or likely benefit payments made to a Veteran, rather than assuming the Veteran would become deceased at a certain age.

If the Veteran receiving PIA estimated in the model were to die younger than any mortality rate would assume, the survivor's benefits that VAC would actually pay would be lower than the full Veteran's benefits that the model calculates. See Table B-2 below for an illustrative example.

Table B-2 Illustration of scenarios for under- and over-estimation

Status	PBO results	Veteran	Survivor
Alive	**Accurate** if using Veteran Results; **Underestimation** if using Survivor Results.	($ELB + $PIA + $SRB) x Mortality adjustment x Inflation	($ELB + $SRB) x Mortality Adjustment x Inflation
Deceased	**Overestimation** if using Veteran Results; **Accurate** if using Survivor Results.	($ELB + $PIA + $SRB) x Mortality adjustment x Inflation	($ELB + $SRB) x Mortality Adjustment x Inflation

Source: PBO illustration

To estimate the cost of recently announced changes to VAC benefits, PBO had to make some adjustments to the conditions and assumptions in the model. These are explained in Appendix C.6.2.

B.2.1 VBA Code

The OVO model was designed to present the lifetime NVC benefits for an individual disability Veteran and their survivor(s). The model did these calculations one Veteran at a time. The process of manually entering information on each of the 45,000-plus Veterans would have been too time-consuming, and subjects itself to human error in the data entry.

PBO wrote a Visual Basic (VBA) script that wrote in each recipient's required information from the modified dataset into the OVO model's intake page, copied the model's results for that individual, and rearranged that information so that it could be exported into a database-management software.

The VBA script ran a loop to do this for all recipients in the modified dataset.[17] Even with the VBA script, it takes roughly one hour to process the results for all 45,000-plus Veterans.

The model allowed the user to input specific information about an individual Veteran. Prior to implementing the VBA script, PBO prepared a formatted version of the VAC dataset such that the OVO model would recognize the information stored in it. For example, while the VAC dataset used a numerical code and description to identify Veterans in receipt of a specific financial benefit, the OVO model required a "Yes" or "No" response.

The results were merged back to the VAC dataset, allowing analysis by cohort and comorbidity.

B.2.2 Model validation

PBO developed a cost estimate for providing financial benefits under the NVC, projected to the year 2025. There is little difference between PBO's cost estimate and VAC's projected program spending (see Table B-3).

Using a bottom-up approach then aggregating those totals produces an estimate that is close to historical values and VAC's projected values. This result supports the use of PBO's methodology to produce disaggregated results (that is, the accuracy of this method to estimate individual cost elements including the NVC enhancements, providing financial support to Veterans living with mental illness, and of those who served in Afghanistan).

PBO anticipated its estimates to be slightly lower than those of VAC, since PBO's estimates are based on a sub-population whereas VAC's estimates are based on all eligible Veterans.

Table B-3

PBO validation

Source	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
PBO (disability only)	$157.9	$195.5	$220.4	$229.2	$229.9
VAC (total)	$158.7*	$207.1	$214.1	$240.9	$267.3
PBO (Sensitivity)**	$109.2	$138.0	$156.9	$164.4	$166.6

** Assumes pension income offsets as calculated by PBO.

Sources: Veterans Affairs Canada Reports on Plans and Priorities (various years); *Public Accounts of Canada (2013-2014); PBO analysis.

PBO also ran a sensitivity analysis that estimated pension-based income offsets, which is a limitation in the baseline results.

Since PBO did not have information about Veterans' other sources of income, PBO could not accurately account for applicable income offsets, which are deducted from ELB. In other words, the amount VAC pays in ELB to Veterans is reduced by the amount Veterans receive from prescribed sources, including pensions (excluding pensions paid from the *Pension Act*), employment income and other sources. Only the Canada Pension Plan (CPP) was included as an income offset in PBO's estimates.

When examining the data, few Veterans in receipt of ELB had earnings, and PBO determined any income offset calculation would not be material. Several Veterans receiving ELB were, however, in receipt of a pension other than the CPP.

Appendix C: Detailed Methodology

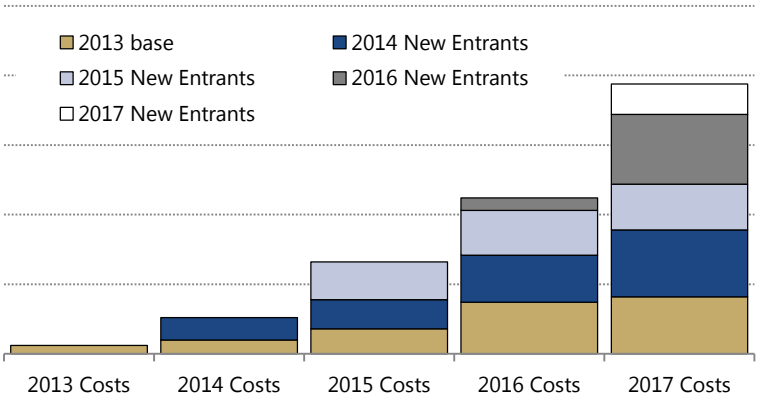
This section provides a detailed methodology, based on the 2013 base year population.

C.1 Overview of methodological approach and assumptions

PBO assumes the base population from September 2013 reflects the average number of recipients in 2013. We expect that there would be fluctuations in the number of Veterans or survivors in receipt of a benefit. With the available data, PBO could not calculate yearly variance of new entrants.

Two main calculations were required to estimate the annual total (financial benefit) costs of disability NVC recipients. The first calculated the annual costs of the 2013 base population, from 2013 to 2025. The next step calculated and added the annual costs of new recipients from the year of entry to 2025. See Figure C-1 below for illustrative presentation of how this works.

Figure C-1 Graphical demonstration of calculating annual costs



Source: PBO calculations

C.2 2013 Base population calculations

To arrive at the total costs for this base population, PBO calculated the annual value of each Veteran's financial benefits, based on their eligibility criteria, and summed the total. These calculations were done using the actuarial model provided by OVO. PBO used the results up to 2025.

The average costs used in PBO's calculations are provided in Table C-1 below.

Table C-1 Average cost of 2013 recipients

Year	Recipients	Average cost/recipient	Average cost/disability client*
2013	3,907	40,416	3,480
2014	3,901	40,406	3,474
2015	1,604	35,299	1,248
2016	1,589	35,845	1,255
2017	1,580	35,954	1,252
2018	1,563	36,304	1,251
2019	1,558	36,331	1,247
2020	1,539	36,232	1,229
2021	1,519	36,458	1,220
2022	1,502	36,562	1,210
2023	1,478	36,307	1,183
2024	1,459	36,039	1,159
2025	1,432	35,684	1,126

* Includes Veterans not in receipt of financial benefits

Source: PBO analysis of VAC data, using OCA projections

Box C-1 – Recipients over time

Over the 12-year period, Veterans and survivors may no longer be eligible for a specific benefit. This is reflected in the total number of recipients who entered in the same year. For example, in 2015 only 1,604 of the original 3,907 Veterans and survivors were in receipt of a financial benefit. Over time, this number continues to decline.[1]

Similarly, Veterans may die, terminating some of VAC's payments to them.[2] This would reduce the average cost. Working counter to this, however, are the legislated adjustments to the value of benefits that are often tied to inflation or some other interest rate. On average, the combination of these two effects generally results in an increasing average cost from 2015 to 2022, after which the effects of mortality outweigh the effects of inflation and interest adjustments.

In the model, this is accounted for through the use of mortality rate adjustments. That is, the number of recipients is determined strictly by eligibility requirements, and the dollar value is adjusted by legislated increases and mortality rates.

[1]Recall PBO assumes that temporary earnings loss benefit is paid up to a maximum of two years, and is assumed to be paid in the first two years of becoming a financial benefit recipient, if eligible. The sudden drop in recipients between 2014 and 2015 reflect this.
[2]A Veteran who dies may have an eligible survivor to whom a benefit may continue to be paid, subject to eligibility requirements.

Multiplying these average costs by the applicable number of new entrants produces PBO's annual new entrant costs. These were added to the total annual costs (stock of benefits) from the previous year's new entrants (or in the case of 2014, added to the total 2013 base costs).

PBO had to manually adjust the second-year temporary ELB estimate in 2013, to reflect the number of Veterans who began receiving ELB in 2012 and were no longer eligible in 2014.[18]

The main assumptions in this report are that:

1. New entrants have the same average costs, and therefore are assumed to have the same characteristics, as the 2013 base population;
2. These average costs grow at 2 per cent annually;
3. The estimated total number of new entrants eligible for a financial benefit, as estimated by the OCA, will all present themselves in that year; and,
4. The proportion of new entrants receiving each benefit does not change over time, and is equivalent to the 2013 distribution. That is, the proportion of new entrants in 2022 receiving ELB is, for example, the

same as the proportion of new entrants in 2013, 2016 and so on, receiving ELB.

C.3 New entrants calculations

To calculate the annual cost of new entrants, PBO used the annual average costs from the 2013 base multiplied by the total number of new entrants. The Office of the Chief Actuary (OCA)[19] produces an annual report for the Office of the Comptroller General (OCG).[20]

Included in the report are estimates of the number of new clients, or "future entrants", who will be receiving NVC benefits. PBO used OCA's estimates to project the number of new recipients of disability awards and financial benefits. The number of new entrants for each year reflects the rate of expected incidence, accounting for the time between when an event occurs and when a Veteran applies for an NVC benefit.[21]

Table 26 of the OCA's report provides an estimate of the number of disability new entrants expected to come forward on an annual basis. The estimates are presented in Table C-2 below. The table includes Veterans who have a disability assessment greater than 0 per cent, and would therefore be eligible for a disability award. Inherently, these new entrants also capture Veterans who are also eligible for financial NVC benefits. They also include Veterans who may be *only* eligible for a Disability Award, but not a financial benefit.

Table C-2 Number of disability new entrants

FY	New Entrants
2014	5310
2015	5200
2016	5090
2017	4980
2018	4860
2019	4750
2020	4630
2021	4510
2022	4400
2023	4280
2024	4130
2025	4130

Source: Office of the Chief Actuary (2014), Table 26

PBO adjusted these numbers using additional information from the OCA report and VAC data to reflect the total number of new entrants receiving at

least one of the financial benefits, which is a fraction of the total number of disability new entrants.

To do this, PBO used tables 60 and 61 from the OCA report (not presented for reasons of confidentiality), which provide the anticipated annual number of new recipients of financial benefits, that is, recipients of temporary ELB, extended ELB, PIA, and PIAS.

It was not possible to use the sum of these estimates because a Veteran receiving ELB could also be in receipt of PIA and/or PIAS, thus leading to the double-counting of future entrants. Instead, PBO applied the ratio of benefit recipients found in the VAC dataset to create the population of future entrants.

Specifically, using the VAC dataset, PBO identified the number of unique 2013 financial benefit recipients over time. These are displayed in Table C-1 .

PBO also summed the number of recipients by benefit type using the VAC dataset. This was done by adding up the number of Veterans in receipt of temporary ELB, inclusive of Veterans in receipt of any other financial benefit; the number of Veterans in receipt of extended ELB, inclusive of Veterans in receipt of any other financial benefit; the number of Veterans in receipt of PIA, inclusive of Veterans in receipt of any other financial benefit; and the number of Veterans in receipt of PIAS, inclusive of Veterans in receipt of any other financial benefit.

Doing so produced an estimate roughly equivalent to summing the OCA's estimated number of beneficiaries by benefit type. Using the number of unique recipients as a numerator and the number of 'double-counted' recipients as the denominator creates a ratio of unique to double-counted recipients.

PBO multiplied this ratio by the sum in the OCA tables.[22] The result is an annual estimate of the unique number of financial benefit new entrants.

C.4 Afghanistan new entrants assumptions

In 2011, the OCA produced an actuarial report on the future payments of VAC benefits made specifically to eligible Veterans with service in Afghanistan.

The report contained a low and high estimate of the number of new entrants; PBO calculated and used the average. Unfortunately, the report did not project the number of new entrants by financial benefit as in the annual OCA report. The report projected the number of entrants for the 2009-2010 fiscal year.

Following a similar methodology as described in Appendix C.3 above, PBO used the 2013 VAC dataset to produce the number of financial benefit recipients as the numerator and the number of disability new entrants as the denominator to create a ratio. This ratio was based on the 2013 dataset using only those recipients who had service in Afghanistan, which were flagged in the dataset.

Since this ratio could only be calculated for a single fiscal year, the underlying assumption is that the ratio of financial benefit new entrants to all disability new entrants remains constant over time. Multiplying this ratio by the number of projected disability new entrants as provided in the OCA Afghanistan report produced the estimated number of financial benefit new entrants for the Afghanistan cohort.

C.5 Total annual cost calculations

For 2014 to 2025, the following formula was used to calculate the annual total costs of VAC's financial benefits to disability Veterans.

$$NEC_{ij} = \left(NE_{ij} * R_{ij} * FR_{ij}\right) * C_{ij}$$

NEC is the new entrant total cost of group i (for example, Veterans with service in Afghanistan) for year j, which is equal to the number of financial benefit new entrants in receipt of a financial benefit multiplied by their average cost. NE is the number of new entrants of group i in year j, in its raw form provided by the OCA report. That is, it is the number of 'double-counted' or summed financial benefit new entrants as explained in section C.3 and C.4 above. R is the share of clients in year j that will continue to receive benefits the following year. This number changes as the number of j-year's new entrants age and are no longer eligible to receive extended ELB (that is, they are 65 years old).[23] FR is the number of group i unique financial benefit recipients as a ratio of the total number of double-counted financial benefit recipients in year j. Lastly, C is the average cost of all financial benefit recipients in year j.

The section in brackets collectively produces the number of new entrants who are in receipt of a financial benefit, for each year from the year of entry until 2025. The ratio of financial benefit recipients to double-counted financial benefit recipients (i.e. FR) was derived from the entire disability population. That is, this ratio does not differ for each cohort or morbidity. This is a limitation of PBO's estimates.

Finally, to calculate the total costs for the year, PBO summed the costs of the 2013 base population for that year with the new entrants' costs for that year. The general formula to calculate the total costs of group i for year j is:

$$YC_{ij} = Base_{2013} + \sum_{2014}^{j} NEC_{ij}$$

The new entrants' costs, depending on which year, could include multiple new entrants groups' costs. For example, the estimated total cost for 2017 was calculated by summing the costs of the 2013 base population's costs in 2017, and the 2014, 2015, 2016 and 2017 new entrant's cost in 2017.

C.6 PBO data and model manipulations

Additional manipulations involved changing characteristics in the initial data set, and running this through the OVO model.

C.6.1 Supplementary retirement benefit

PBO's estimate initially excluded Veterans with income too high to be eligible for ELB, but otherwise eligible to receive ELB. This underestimated the total annual costs because these Veterans are eligible to receive the lump-sum supplementary retirement benefit when the Veteran turns 65. This amount is equivalent to 2 per cent of what would have been paid out as ELB.

The SRB is calculated in the OCA model. However, the model was unable to distinguish between a Veteran ineligible for ELB solely because of their income, and a Veteran who was eligible for ELB. To incorporate this missing cost, PBO selected only those Veterans whose income made them ineligible for the SRB in the VAC dataset and used the model to calculate their annual costs.

Slight modifications to the model were also required. If the Veteran had a non-service related death, the Veteran had to have been totally and permanently incapacitated for the survivor to be eligible. Otherwise, a Veteran was eligible so long as (s)he was eligible for ELB but for her/his income, and a survivor was eligible so long as the Veteran's death was service-related. Therefore, PBO added a check for whether a Veteran was totally and permanently incapacitated before allowing the model to calculate a value for SRB for survivors of these Veterans.

Overall, these benefits represented a very small share of the total annual costs.

C.6.2 NVC enhancements

To calculate the additional costs of the retirement benefit and the new ELB minimum income threshold for part-time reservists, PBO had to alter some of the OVO model's assumptions.

To calculate the new retirement benefit, PBO added an additional column to separately calculate the mortality-inflation-adjusted value of this benefit. Using conditions, this benefit was set to begin when the Veteran turned 65, and was equivalent to 70 per cent of the total benefits the Veteran had received when (s)he was 64. That is,

$$70\% \text{ (ELB + PIA)} - \text{PIA}$$

These benefits were inflated over time in line with ELB, as determined by the OCA model. The Veteran's total payment also included a CPP deduction, and was mortality adjusted.

For the survivor calculations, this benefit was equal to a maximum of 50 per cent of the value of what the Veteran would have received, if (s)he had been alive.

Implementing the increased income threshold for part-time reservists' ELB benefit was much simpler. PBO merely eliminated the check for part-time status, and thus eliminated the model's use of a separate part-time reservist benefit level. That is, PBO's changes resulted in the model using the full-time service minimum income threshold for all Veterans.

C.7 Sensitivity analysis – calculation of pension income

To account for pension income that is deducted from VAC ELB payments, PBO calculated a crude pension value for each Veteran in receipt of both ELB and a pension (other than CPP).

In general, public service pensions are calculated by multiplying annual income by the number of years of pensionable service (up to a maximum) multiplied by a set percentage.

PBO used the average age of recruitment (24 years old[24]) as a starting point for determining the number of years of service a Veteran may have. For retirement because of a disability, minimum pensionable years are lower than if retiring for other reasons.

Two years of service or less resulted not in a pension payment, but a full return of funds. Therefore, any Veteran that was 26 years old in 2013 would have no pension income offset. Veterans with two to 10 years of service –

which would include Veterans who were between the ages of 26 and 34 – would be eligible for a deferred annuity. PBO used

$$[(26+34)/2 - 24] = 6$$

as the static number of years of service for Veterans of this age. Veterans with 10 years of service or more – up to a maximum of 35 – would be eligible for an immediate annuity. PBO used

$$[(35+59)/2 - 24] = 23$$

as the static number of years of service for Veterans of this age. PBO used 35 as the static number of years of service for Veterans over the age of 59.

The calculation of the income offset used the applicable 'static' years of service, multiplied by 2 per cent multiplied by the Veteran's income at retirement. These income offsets were grown in line with that of CPI, as determined by the actuarial model.

Appendix D: Analysis of all recipients as of September 2013

This appendix analyzes Veterans' financial benefits by various sub-populations, under the assumptions that existed prior to the 2015 NVC enhancements.

Among all NVC disability Veterans and survivors, only 9 per cent are in receipt of at least one of the NVC financial benefits (see Table D-1). This proportion is only slightly higher among those without service in Afghanistan. Recent changes to the NVCs financial benefits did not change this; however, a greater proportion of clients will maintain their financial benefits for a longer period of time.

The average total disability assessment was 27 per cent in September 2013, and was not much higher among those with Afghanistan service. However, there are other differences between these groups.

Table D-1 Population characteristics, as of September 2013

	All	Afghanistan	Non-Afghanistan
TEL recipients	5%	5%	5%
Extended ELB recipients	2%	1%	2%
Extended ELB eligible*	2%	2%	2%
PIA recipients	3%	3%	3%
PIAS recipients	2%	2%	2%
Any financial benefit recipients	9%	8%	9%
Average Age	58	41	61
Married/Common-Law	62%	55%	63%
Single (never married)	33%	41%	31%
Gender (Female)	8%	8%	8%
DA only clients	63%	72%	61%
Dual clients	30%	26%	31%
Average DA assessment	16	25	14
Average DP assessment	11	6	12
Total disability assessment	27	31	26
Afghanistan service	18%	100%	0%
Mental Health	21%	46%	16%
PTSD	16%	39%	11%
Musculoskeletal	51%	66%	48%
Annual Income**	$61,449	$65,398	$60,583

*Eligible, but income is too high

** Income statistics only available for some Veterans. Income data is only collected when required to calculate certain benefits. Reflects pre-release, income.

Source: PBO analysis of VAC data

Table D-2 presents the characteristics of Veterans who were in receipt of at least one financial benefit in 2013.

Table D-2 Recipient characteristics, as of September 2013

	All	Afghanistan	Non-Afghanistan
TEL recipients	59%	67%	58%
Extended ELB recipients	23%	7%	26%
Extended ELB eligible*	12%	18%	11%
PIA recipients	31%	34%	31%
PIAS recipients	31%	27%	32%
Any financial benefit recipients	100%	100%	100%
Average Age	47	40	49
Married/Common-Law	59%	51%	61%
Single (never married)	30%	39%	29%
Gender (Female)	15%	7%	16%
DA only clients	34%	62%	28%
Dual clients	36%	29%	37%
Average DA assessment	23	40	19
Average DP assessment	28	13	31
Total disability assessment	50	52	50
Afghanistan service	17%	100%	0%
Mental Health	68%	86%	64%
PTSD	47%	73%	42%
Musculoskeletal	72%	62%	73%
Annual Income**	$60,974	$64,072	$60,377

*Eligible, but income is too high
** Income statistics only available for some Veterans. Income data is only collected when required to calculate certain benefits. Reflects pre-release, income.

Additional characteristics that will assist in explaining the results presented in sections below are:

- The average age of Veterans with service in Afghanistan is 41, 20 years younger than those without Afghanistan service (61).
- Mental health conditions are more prevalent among those with service in Afghanistan, as is PTSD (a subset of mental health conditions).
- Only 18 per cent of all disabled Veterans have service in Afghanistan.
- Very few Veterans with service in Afghanistan receive ELB, relative to their counterparts without service in Afghanistan.

It is also important to understand how financial benefits are determined. Of the financial benefits, only the values of PIA and the PIA supplement appear to be closely tied to the level of disability assessment. The level of the value of PIA has three grades, where grade one has the highest value, and three the lowest.

Eligibility requires that Veterans have a permanent and severe impairment for which a disability benefit is paid, and be is eligible for rehabilitation

services.[25] The greater the impairment – which is likely correlated with level of disability assessment – the higher the PIA payment.

While eligibility for TEL and ELB are tied to the degree of impairment (though not directly tied to the level of the disability assessment), the value or level of these benefits is actually derived from pre-release income and until more recently, part-time or full-time status.[26] This should not be surprising as the intention of these benefits is to replace the level of income a Veteran would have earned, had (s)he not become impaired from doing so.

Generally then, eligibility for financial benefits may be associated with the level of disability assessment. The values of the benefits, however, are less dependent on the degree of disability, and more on the degree of financial need. This is useful in understanding the variation in costs among cohorts and morbidities.

It is the disability award that is directly tied to the degree or severity of a disability.

The average annual costs did not greatly differ between cohorts or morbidities. The exception to this is the Afghanistan cohort, where the average costs decline after the second year of being a disability client.[27]

This general trend is partially explained by comorbidities, that is, a large number of Veterans with PTSD may also have a musculoskeletal disorder, and/or service in Afghanistan. But it is also explained by the fact that financial benefits do not discriminate between morbidities or cohorts; they are based on a Veteran's need and for some benefits their pre-release income.

Estimated average costs increase for clients over time before falling. This is due to actuarial assumptions that take into account the legislated growth rate of benefits and adjust for mortality rates and eligibility.

With the Afghanistan cohort being a much younger group of Veterans, we do not see the estimated average costs decline because this cohort is more likely to remain in receipt of ELB, and their mortality adjustments are much smaller.[28]

Table D-3 provides the average costs that were applied in the calculation of total costs for each group. The total cost is dependent on the total number of recipients and the average cost as provided below.

Table D-3 Average cost per recipient by cohort/morbidity

	All	Afghanistan	Afghanistan-disabled	Non-Afghanistan
2013	$40,416	$39,377	$39,312	$40,623
2014	$40,406	$39,485	$39,423	$40,590
2015	$35,299	$26,609	$26,814	$36,651
2016	$35,845	$27,178	$27,390	$37,209
2017	$35,954	$27,654	$27,981	$37,276
2018	$36,304	$28,317	$28,534	$37,585
2019	$36,331	$28,968	$29,206	$37,517
2020	$36,232	$29,521	$29,749	$37,328
2021	$36,458	$30,060	$30,270	$37,524
2022	$36,562	$30,689	$31,011	$37,554
2023	$36,307	$30,766	$30,747	$37,266
2024	$36,039	$31,403	$31,514	$36,845
2025	$35,684	$31,497	$31,747	$36,419

	Mental Health	Non-Mental Health	PTSD	Non-PTSD	Musculoskeletal	Non-Musculoskeletal
2013	$39,464	$42,405	$39,347	$41,362	$40,379	$40,510
2014	$39,499	$42,299	$39,448	$41,254	$40,368	$40,501
2015	$34,452	$39,614	$34,185	$36,786	$35,170	$35,636
2016	$34,966	$40,488	$34,714	$37,369	$35,507	$36,735
2017	$35,147	$40,314	$34,675	$37,700	$35,781	$36,407
2018	$35,377	$41,488	$34,893	$38,254	$36,132	$36,755
2019	$35,419	$41,467	$34,813	$38,441	$36,158	$36,784
2020	$35,599	$39,930	$35,119	$37,783	$35,951	$36,962
2021	$35,704	$41,057	$35,195	$38,261	$36,334	$36,776
2022	$35,936	$40,497	$35,548	$38,041	$36,323	$37,181
2023	$35,700	$40,372	$35,396	$37,671	$36,110	$36,817
2024	$35,562	$39,310	$35,259	$37,222	$35,702	$36,906
2025	$35,044	$40,499	$34,760	$37,157	$35,229	$36,832

Source: PBO analysis of VAC data

PBO estimates the total cost of NVC financial benefits to disability Veterans and survivors will be $220.4 million in 2015. It will increase to $340.2 million in 2025. These estimates are roughly 4 per cent higher or lower than that of VAC because of differences in assumptions.[29] This serves as a test of reasonableness, with respect to PBO's methodology.

D.1 Recipients who served in Afghanistan

Analysis of these cohorts was the basis for future mission costs. It was important to determine the cost of Veterans with service in Afghanistan and compare it to the cost of Veterans without service in Afghanistan. Similarly, PBO examined the costs of Veterans who had a disability that was attributable to their service in Afghanistan.

Where the Afghanistan cohort significantly differs from its peers is in the age and the nature of its disability profile.

The recentness of the Afghanistan conflict means that disabled Veterans who served in Afghanistan are on average 20 years younger than their peers who did not serve in Afghanistan.[30] They are also nearly three times more likely to be living with a mental illness. This finding is interesting because it demonstrates how the nature of disability and severity changes with the nature of combat exposure.

Since financial supports are determined by the severity of disability (as opposed to a diagnosis), the number of Afghanistan Veterans living with mental illness is not a predictor of the average annual benefit received. However, a mental health diagnosis can increase the duration and frequency with which a Veteran accesses health care or other NVC services.[31]

PBO found that both the Afghanistan and Afghanistan disabled cohorts received a lower average benefit than those without service in Afghanistan.

Table D-4 Average benefit by recipient for Afghanistan cohort

Year	Afghanistan	Afghanistan-disabled	Non-Afghanistan
2013	39,377	39,312	40,623
2014	39,485	39,423	40,590
2015	26,609	26,814	36,651
2016	27,178	27,390	37,209
2017	27,654	27,981	37,276
2018	28,317	28,534	37,585
2019	28,968	29,206	37,517
2020	29,521	29,749	37,328
2021	30,060	30,270	37,524
2022	30,689	31,011	37,554
2023	30,766	30,747	37,266
2024	31,403	31,514	36,845
2025	31,497	31,747	36,419

Source: PBO analysis of VAC data

In addition, the proportion of recipients among the non-Afghanistan cohort was larger than that of the Afghanistan cohort. The proportion of recipients among the disabled non-Afghanistan cohort was also larger than that of the Afghanistan-disabled cohort, except for the first two years. The latter is likely explained by the fact that more Afghanistan-disabled Veterans received temporary ELB, which PBO assumes is payable for a maximum of two years.[32]

A lower average benefit combined with both a smaller number of recipients and a smaller share of recipients, results in the total benefits of both the Afghanistan and Afghanistan-disabled cohorts was a small fraction of the non-Afghanistan cohort's total benefits.

If judging by the average benefit received, it would appear that the Afghanistan and Afghanistan-disabled cohorts do not require more financial benefits than those without Afghanistan service. Examining recipients of benefits inclusively (that is, recipients of one benefit and possibly in receipt of other benefits) demonstrates the variation across benefits.

The Afghanistan cohort has a higher average cost per recipient among recipients of extended ELB – nearly one and half times higher by 2025 – than the non-Afghanistan cohort. On the other hand, the average benefit received per recipient of other benefits either falls below or is at the level of non-Afghanistan cohort recipients.

The reason the total average Afghanistan cohort benefits falls below that of the non-Afghanistan cohort is that the relatively smaller share of extended ELB recipients among the Afghanistan cohort is not enough to outweigh the relatively lower average benefits and relatively greater number of recipients of other benefits.

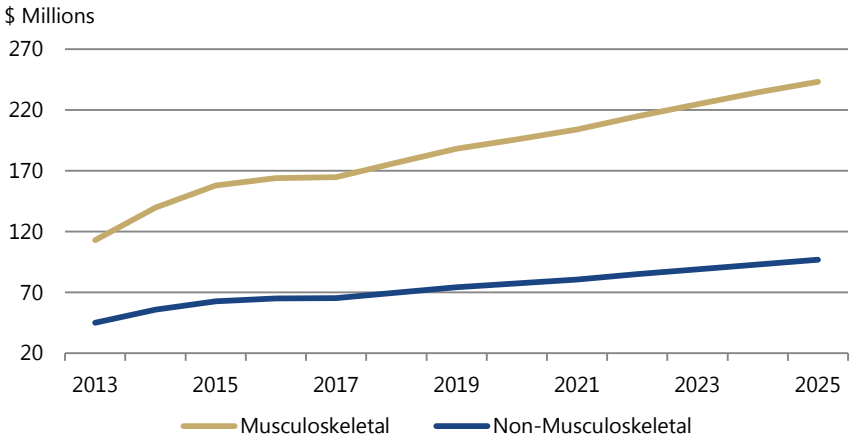
Also, recall that the level of temporary ELB and extended ELB financial benefits is not directly tied to the level of the disability assessment.

D.2 Recipients with musculoskeletal morbidity

While the average benefit of a Veteran with a musculoskeletal disorder is comparable to one without, the total benefits of Veterans with a musculoskeletal disorder were much greater because of a greater number of recipients.

Figure D-1

Musculoskeletal



Source: PBO projections derived from VAC data and OVO model

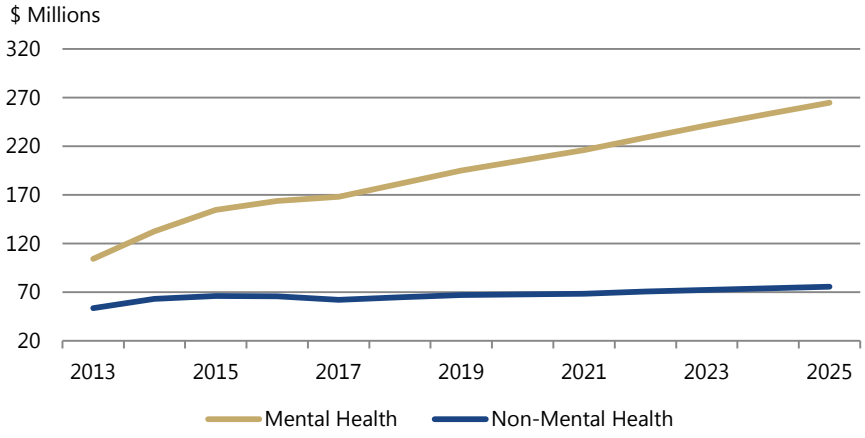
D.3 Recipients with mental health morbidity

Similar to the Afghanistan/non-Afghanistan cohorts, recipients with a mental health condition receive slightly less, on average, than recipients without a mental health condition.

However, the total number of recipients with a mental health condition is much higher than those without a mental health condition. This resulted in the total benefits of the mental health cohort surpassing the total benefits of those without a mental health condition.

Figure D-2

Veterans with mental health conditions receive less on average in financial support



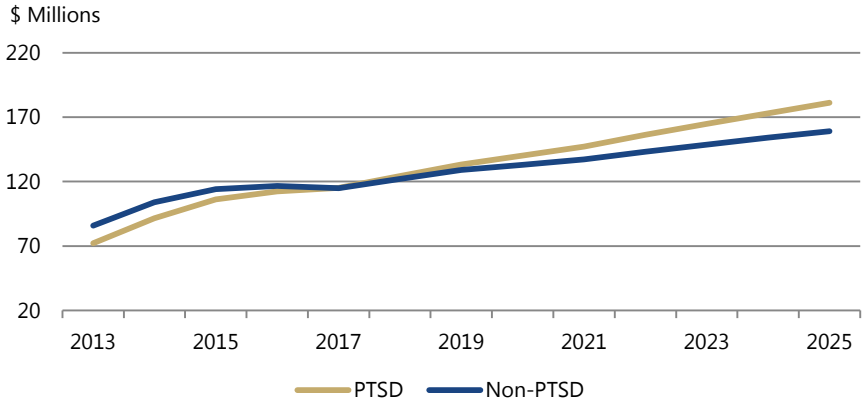
Source: PBO projections derived from VAC data and OVO model

The relatively high average cost per Veteran without a mental health morbidity is due to a greater number and proportion of these Veterans who were in receipt of the highest-paying PIA grade (that is, grade one). The large number of Veterans with a mental health morbidity in receipt of grade three PIA payment levels brought the average below that of those without a mental health morbidity.

D.3.1 Recipients with PTSD

Post-Traumatic Stress Disorder (PTSD) is a subset of the mental health morbidity. Veterans without PTSD received a lower average benefit than Veterans with PTSD. However, there are more Veterans living with PTSD than those without receiving a financial benefit post 2014. This brings the total benefits of Veterans living with PSTD above that of Veterans without PTSD.

Figure D-3 Cost of benefits for Veterans with PTSD will surpass their peers

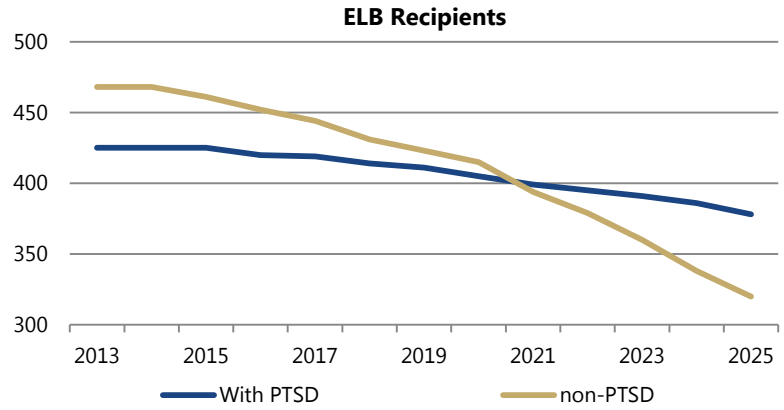


Source: PBO projections derived from VAC data and OVO model

This trend implies that while fewer Veterans living with PTSD receive temporary ELB, a greater portion of them maintain extended ELB. The gap between these two groups also widens over time.

This is explained by a decline in the number of those without PTSD extended ELB recipients over time.[33] Recall that extended ELB is only paid until the Veteran reaches the age of 65, implying that those without PTSD are older than those suffering from PTSD.[34]

Figure D-4 Number of ELB recipients declines over time



Source: PBO projections derived from VAC data and OVO model

Appendix E: Limitations

E.1 NVC enhancements not included in PBO analysis

To cost the critical injury benefit, PBO required additional information on the circumstances of the injury, which was not available in the VAC dataset. According to VAC's website, eligibility requires a severe and traumatic injury or acute disease which:

- Was service-related;
- Was the result of a sudden and single incidence occurring on or after April 1, 2005; and
- Immediately caused a severe impairment and interference in quality of life.[35]

Additionally, the VAC dataset did not include sufficient information to determine whether an impairment was severe and interfered with the quality of life.

The dataset also did not provide specifics on the injury or impairment that would allow PBO to determine whether a Veteran would be eligible for PIA since the broadened criteria had been implemented.

References

Canadian Forces Members and Veterans Re-establishment and Compensation Act (S.C. 2005, c. 21) (2015).

Congressional Budget Office. (2012). Treatment of PTSD and Traumatic Brain Injury by the Veterans Health Administration from https://www.cbo.gov/publication/42980

Marciniak, M. D., Lage, M. J., Dunayevich, E., Russell, J. M., Bowman, L., Landbloom, R. P., & Levine, L. R. (2005). The cost of treating anxiety: the medical and demographic correlates that impact total medical costs. *Depression and Anxiety, 21*(4), 178-184.

Marshall, R. P., Jorm, A. F., Grayson, D. A., & O'Toole, B. I. (2000). Medical-care costs associated with posttraumatic stress disorder in Vietnam Veterans. *Australian and New Zealand Journal of Psychiatry, 34*(6), 954-962.

National Defence and the Canadian Armed Forces. (2013). New Compulsory Retirement Age for the CF Retrieved September 15, 2015, from http://www.forces.gc.ca/en/news/article.page?doc=new-compulsory-retirement-age-for-the-cf/hnocfnhk

Office of the Chief Actuary. (2014). Actuarial Report on the Future Benefits for Veterans As at 31 March 2014.

Standing Committee on Veterans Affairs. (2014). *The New Veterans Charter: Moving Forward*. Retrieved from http://www.parl.gc.ca/content/hoc/Committee/412/ACVA/Reports/RP6635229/acvarp03/acvarp03-e.pdf.

Stapleton, J. A., Asmundson, G. J. G., Woods, M., Taylor, S., & Stein, M. B. (2006). Health Care Utilization by United Nations Peacekeeping Veterans with Co-occurring, Self-Reported, Post-Traumatic Stress Disorder and Depression Symptoms versus Those Without. *Military Medicine*, 171(6), 562-566. doi: 10.1080/08964289709596730

Statistics Canada. (2011). *Families and Households Highlight - Private households by household type*. Retrieved from: https://www12.statcan.gc.ca/census-recensement/2011/dp-pd/hlt-fst/fam/Pages/highlight.cfm?TabID=1&Lang=E&Asc=1&PRCode=01&OrderBy=999&View=1&tableID=302&queryID=1

Veterans Affairs Canada. (2015a). Critical Injury Benefit Retrieved August 27, 2015, from http://www.Veterans.gc.ca/eng/services/after-injury/critical-injury-benefit

Veterans Affairs Canada. (2015c). Permanent Impairment Allowance Retrieved August 2015, from http://www.Veterans.gc.ca/eng/services/transition/rehabilitation/permanent-impairment-allowance

Veterans Ombudsman. (2013a). *Improving the New Veterans Charter: the Actuarial Analysis*. Retrieved from http://www.ombudsman-Veterans.gc.ca/eng/reports/reports-reviews/rep-rap-05-2013.

Veterans Ombudsman. (2013c). Improving the New Veterans Charter: The Report.

Notes

1 Congressional Budget Office (2012), Marciniak, Lage, Dunayevich, Russell, Bowman, Landbloom and Levine (2005), Marshall, Jorm, Grayson and O'Toole (2000), Stapleton, Asmundson, Woods, Taylor and Stein (2006).

2 VAC also provides an aggregated Disability and death compensation estimate to the Receiver General, which is published in the Public Accounts of Canada.

3 The offset of disability pension when calculating the Canadian Forces Income Support benefits was also terminated.

4 Veterans Ombudsman (2013c), Veterans Ombudsman (2013a)

5 Standing Committee on Veterans Affairs (2014)

6 PBO did not include the value of deceased Veteran's benefits paid when the Veteran was still alive in 2013.

7 PBO assumes this benefit is not retroactive. However, PBO's calculation may include some Veterans who were in receipt of ELB in 2013. Effectively, PBO's calculation assumes this benefit is retroactive to 2014. This calculation does not include pension income offsets (see Appendix C.7).

8 Ibid.

9 It is important to note that these costs capture benefits and recipients from 2013 onward. It is possible that there were more recipients prior to 2013. Additionally, some Afghanistan Veterans are covered by the *Pension Act*, which is not captured in this report. Thus, the incremental costs to the NVC are only one part of the total incremental costs of Afghanistan.

10 Congressional Budget Office (2012); refer to pages viii, 14, 15, and 20.

11 Congressional Budget Office (2012), Marciniak, Lage, Dunayevich, Russell, Bowman, Landbloom and Levine (2005), Marshall, Jorm, Grayson and O'Toole (2000), Stapleton, Asmundson, Woods, Taylor and Stein (2006).

12 The age restriction is 24 (that is, under the age of 25) if the child is attending an educational facility. If the child is disabled there is no age restriction. The disability would have had to have occurred before the child attained the age of 18 years, or after 18 but before the age of 25 years while the child was a student. Source: Canadian Forces Members and Veterans Re-establishment and Compensation Act (S.C. 2005, c. 21).

13 The model also contained the rules for the Pension Act benefits; however this report focused solely on the NVC.

14 This is contingent upon a Veteran having a spouse, which is indicated by their marital status in the administrative data. Using a three-year age gap

was arbitrary, and does not impact the calculation of a Veteran's financial benefit.

15 Statistics Canada defines children as someone under the age of 24. PBO assumes the age of Veteran's child was 30 years younger than that of the Veteran, which may be older than 24 years of age.

16 Statistics Canada (2011)

17 Whereas in the OVO model each row represented payments for a single year for an individual and each column a family-status scenario, each row represented an individual Veteran's information with columns for each family-status-year combination in the PBO-created dataset. The data was exported into STATA. This VBA script is available upon request.

18 While SISIP is considered an income offset, only two Veterans in the VAC dataset were in receipt of both SISIP and temporary earnings loss benefit.

19 The Office of the Chief Actuary (OCA) is an independent unit within Office of the Superintendent of Financial Institutions (OSFI). OCA provides actuarial advice to government departments.

20 Veterans Ombudsman (2013a)

21 Despite accounting for the lag in time from when an event occurs to when a Veteran typically begins receiving a benefit for something related to that event, the number of new entrants that actually present themselves may be different. As such, the total amounts actually paid by VAC can be different than the costs PBO calculate which reflect the liability.

22 Recall that the OCA report provides projections on the number of new entrants.

23 This number could potentially increase, as SRB is payable when a Veteran turns 65.

24 National Defence and the Canadian Armed Forces (2013)

25 Veterans Affairs Canada (2015c)

26 In fact, ELB and Tel do not require a Veteran to have a disability award, which implicitly implies having a disability assessment. However, since our data is limited to disability clients, we exclude these clients from our analysis.

27 This is because a small share receive extended earnings loss benefit after, which can be payable if a Veteran had received temporary earnings loss benefit and is totally and permanently incapacitated.

28 The mortality adjustment is not cohort specific. It is possible that even though the Afghanistan cohort is younger, their life expectancy is different than the general Veteran population. PBO did not test this hypothesis.

29 Veterans Affairs Canada in *Report on Plans and Priorities 2015-16*.

30 PBO was unable to determine from the dataset, where else Veterans had served other than Afghanistan.

31 Supra note 11.

32 It is important to recall that all future entrant 'groups' are assumed to have the same distribution, and the same average cost. Only the *total* number of new entrants is adjusted from year to year.

33 Recipients of other benefits remained relatively constant.

34 In actual fact, payment of ELB can also be terminated earlier, if the Veteran is no longer totally and permanently incapacitated. PBO did not account for this possibility in its calculations. Termination of ELB payments is strictly limited to a Veteran turning 65.

35 Veterans Affairs Canada (2015a)