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Retention in the Canadian Armed Forces: A Complex Problem That Requires Active and Continued Management

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**RETENTION IN THE CANADIAN ARMED FORCES
A COMPLEX PROBLEM THAT REQUIRES ACTIVE AND CONTINUED
MANAGEMENT**

By Major K.A. Bériault

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RETENTION IN THE CANADIAN ARMED FORCES – A COMPLEX PROBLEM THAT REQUIRES ACTIVE AND CONTINUED MANAGEMENT

“The women and men of the Canadian Armed Forces and the families that support them are at the heart of everything we do.”¹

The Honourable Harjit S. Sajjan, Minister of National Defence.

INTRODUCTION

The Canadian Armed Forces (CAF) play a large role in the defence of Canadian interests at home and abroad. As a primary mandate, they must be “ready and able to defend [Canadian] sovereignty” and “respond to other emergencies.”² In other words, the CAF are the country’s last resort in case of a belligerent aggression, natural disaster, or other unforeseen emergency. Thus, as this last line of insurance, they must remain ready and able at all times. This requires numerous particularities, but people are definitely the most important as they are both the workers and the product of this organization; they are “at the core of everything the CAF does to deliver on its mandate.”³

Maintaining a healthy workforce is crucial to enabling the CAF in accomplishing its mandate. It is expected by the Canadian population that the CAF be able to react at a moment notice which requires an adequate amount of trained and readied personnel. Recruitment and

¹ Canada, Department of National Defence, *Strong Secure Engaged: Canada’s Defence Policy* (Ottawa;DND, 2017), 6. you could also provide the website link if you wanted. Note the format issues.

² Canada, Department of National Defence, “Mandate of National Defence and the Canadian Armed Forces,” organizational descriptions, aem, February 19, 2013, <https://www.canada.ca/en/department-national-defence/corporate/mandate.html>. You want to be consistent in how you refer to DND – either DND spelled out like I have done or just National Defence

³ Canada and Department of National Defence, *Strong Secure Engaged*, 19. You could revert to just SSE, 19 here but you would need to make a statement in Footnote 1 that the defence policy would be referred to as SSE in all future citations.

training are some of the factors affecting the workforce, but the focus of this paper will be on retention and avoiding a premature and preventable exodus of the CAF talent. Retention has been an issue in the CAF for a significant period of time and has been an area of study for the Auditor General in the 2002, 2006, and 2016 related reports.⁴ Attempts at addressing this issue have been made by the CAF's chain of command, but it remains mostly unsolved. Retention is still a concern listed in Canada's 2017 defence policy "Strong, Secure, Engaged" (SSE) which underlines the importance of protecting the CAF's investment in its people along with its ability to face critical occupation shortages.⁵

Preserving the required amount of talent for effective operations is an issue that most developed countries seem to be struggling with as well. The war on talent is getting more intense as businesses are having more difficulties recruiting and retaining proficient employees.⁶ Prior to March 2020, developed countries were experiencing record low unemployment rates. In Canada, those rates had been steadily declining to 5.5% while the number of job vacancies has been rising considerably.⁷ This leads to a strong employee's job market making it easy for workers to quit and look for new opportunities which were represented in the fact that 25% of US workforce

⁴See Canada, Office of the Auditor General of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," May 1, 2006, https://www.oag-bvg.gc.ca/internet/English/parl_oag_200605_02_e_14959.html; and "Report 5—Canadian Armed Forces Recruitment and Retention—National Defence," November 29, 2016, https://www.oag-bvg.gc.ca/internet/English/parl_oag_201611_05_e_41834.html.

⁵ Canada and Department of National Defence, *Strong Secure Engaged*, 20–21.

⁶ The Economist Intelligence Unit, "Talent Wars: The Struggle for Tomorrow's Workforce A Report from the Economist Intelligence Unit" (The Economist Intelligence Unit, May 2008), 2, <https://www.hrexchangenetwork.com/hr-talent-management/whitepapers/talent-wars-the-struggle-for-tomorrow-s-workforce>.

⁷ Employment and Social Development Canada, "Addressing Labour Shortages," transparency - other, aem, February 21, 2020, <https://www.canada.ca/en/employment-social-development/corporate/reports/briefing-binder-2019/book-1/addressing-shortages.html>.

changed jobs every year.⁸ An aging population may be a part of the problem⁹ as retiring baby boomers, and generation X, along with low birth rates provokes a workforce deficit.¹⁰ The COVID-19 pandemic did have an impact on unemployment and caused it to jump from the 5.5% range to 13%.¹¹ However, this will hopefully only be temporary as workers move back into jobs once public health measures are reduced. Although the entirety of the COVID-19 impacts are not yet known, it is unlikely to eliminate the employee shortage and retention problem. Thus, the retention problem will remain and affects populations larger than the one of the CAF.

Although the retention problem will remain and will affect populations larger than just the CAF, this paper will argue that there are initiatives that can be implemented to improve the CAF's circumstances. In this context, it seems proper to question the nature of the CAF's retention problem in contrast to the one experienced in developed countries. Why is retention such a big issue for the CAF? The first chapter of this paper will attempt to answer this question and shed light to the particularity of the CAF context. The second chapter will seek to understand why, after numerous years of efforts, this issue is still unresolved. Finally, the third chapter of this work will endeavour to identify possible ways to improve the situation.

Chapter one will demonstrate that, in general terms, the CAF have relatively low attrition rates compared to those found in most developed countries. However, because of a high training

⁸ Deloitte Insights, "Leading the Social Enterprise: Reinvent with a Human Focus.," *Deloitte Global Human Capital Trends*, 2019, 71.

⁹ The Economist Intelligence Unit, "Talent Wars," 4.

¹⁰ In this case, baby boomers are defined as the generation born following World War II up to 1964, and generation X as the one born between 1965 and 1974. Those are the generations prone to retire. The parallel to hold here is that those generations are large in numbers and are increasing the numbers of releases and retirements. In contrast, the Canadian birth rate has been decreasing. Together, these facts underline a diminishing number of available workers further emphasizing the need for retention.

¹¹ Statistics Canada Canada, Government Of Canada, "Unemployment Rate Increases for Second Month in a Row," February 5, 2021, <https://www150.statcan.gc.ca/n1/daily-quotidien/210205/cg-a003-eng.htm>.

investment, a closed labour market, and a structure based on efficiency, the impact felt by the CAF is greater. It will also be shown that certain categories and subgroups of the workforce have attrition rates much higher than the average. Chapter 2 will show that the problem is one that is wicked in nature and that it cannot be definitely solved. It must rather be actively managed. Although specific actions have been made in the past, no management body had been orchestrating a general retention strategy until recently. Finally, chapter 3 will present possible methods to be looked at to determine their suitability to a possible retention management strategy.

CHAPTER I - THE CAF'S ISSUES WITH RETENTION

The CAF compared to developed countries

The search for talent is intensifying and becoming a global issue to the point where it is commonly referred as a “war for talent.”¹² This highlights the widespread and commonality of the problem which casts doubt on the intensity of this issue for the CAF. In order to be better able to gauge the magnitude of the problem, a comparison must be made with the other organizations in the talent market.

A common way to measure retention is through employee turnover rates. This measurement has historically been used in many fields and is generally well understood. Although variations of its equation may exist, it usually refers to the proportion of employees moving out of an organization during a one-year timeframe compared to the average number of employees that worked during the same year.¹³ More precisely, as shown in Equation 1.1 below the turnover rate is equal to the sum of employees leaving divided by the employees that worked during a specific year, multiplied by 100 to get a percentage. This metric is largely used and allows for an easy comparison. This is why it has been chosen to measure other organizations' retention ability in comparison to the CAF in this paper.

$$Turnover = \frac{\text{Number of employees leaving during a specific year}}{\text{Average number of employees that worked during the same year}} \times 100 \quad 1.1$$

¹² The Economist Intelligence Unit, “Talent Wars,” 3.

¹³ Deborah J. Russell, John S. Humphreys, and John Wakerman, “How Best to Measure Health Workforce Turnover and Retention: Five Key Metrics,” *Australian Health Review* 36, no. 3 (2012): 290–95; “What Is Employee Turnover?,” BambooHR, accessed March 20, 2021, <https://www.bamboohr.com/hr-glossary/employee-turnover/>.

The Director General Military Personnel Research and Analysis (DGMPRA) of the Department of National Defence (DND) uses the term attrition in a similar fashion as turnover in the annual report on regular force personnel. Their definition sees it as “the proportion of individuals in a given population at a point in time who will be released within the next year” in relation to the population at the beginning of the year in addition to half of the new recruits.¹⁴ This fraction is in turn multiplied by 100 to get a percentage as illustrated in Equation 1.2.

$$Attrition = \frac{2,3+*+34)\$/.'\$')/+- \#'. \&')-}{5\#\#4\$)6+%, \#'. \&')-7\#8'9.-4+6/} \times 100 \quad 1.2$$

The attrition rate for regular forces in the 2012-2013 fiscal year was evaluated at 6.6%.¹⁵ Although a difference is present between both definitions, it will be deemed negligible for the purposes of the comparison. In the turnover definition, the denominator is not defined well enough to know if no, half, or all recruits are included. Variations are known and common, and the implementation of a standardization would be beneficial, but none have been implemented yet.¹⁶ However, in this case, the removal of recruits bring the CAF attrition rate up to 6.8% while the addition of all recruits brings it down to 6.4%. This variance of plus or minus 0.4% will not change the conclusions of this analysis and therefore will not be discussed any further. Therefore, the CAF attrition rate of 6.6% +/- 0.2% will be compared to openly available organizational turnover rates.

¹⁴ Canada, Military Workforce Modelling & Analysis Team, “Annual Report On Regular Force Personnel 2012/2013” (Director General Military Personnel Research and Analysis Department of National Defence, 2015), 34.

¹⁵ Canada, Military Workforce Modelling & Analysis Team, 35.

¹⁶ Russell, Humphreys, and Wakerman, “How Best to Measure Health Workforce Turnover and Retention.”

The first comparison will contrast the CAF’s attrition rate to the global average and the turnover rates of some developed countries based on a LinkedIn study.¹⁷ In this case, professionals were considered to have left their jobs if they had provided an end date to their employment profiles. The result illustrated in Figure 1.1 situates the CAF at about half of the global average turnover. This seems to suggest that the CAF has a healthy rate in comparison to the world.

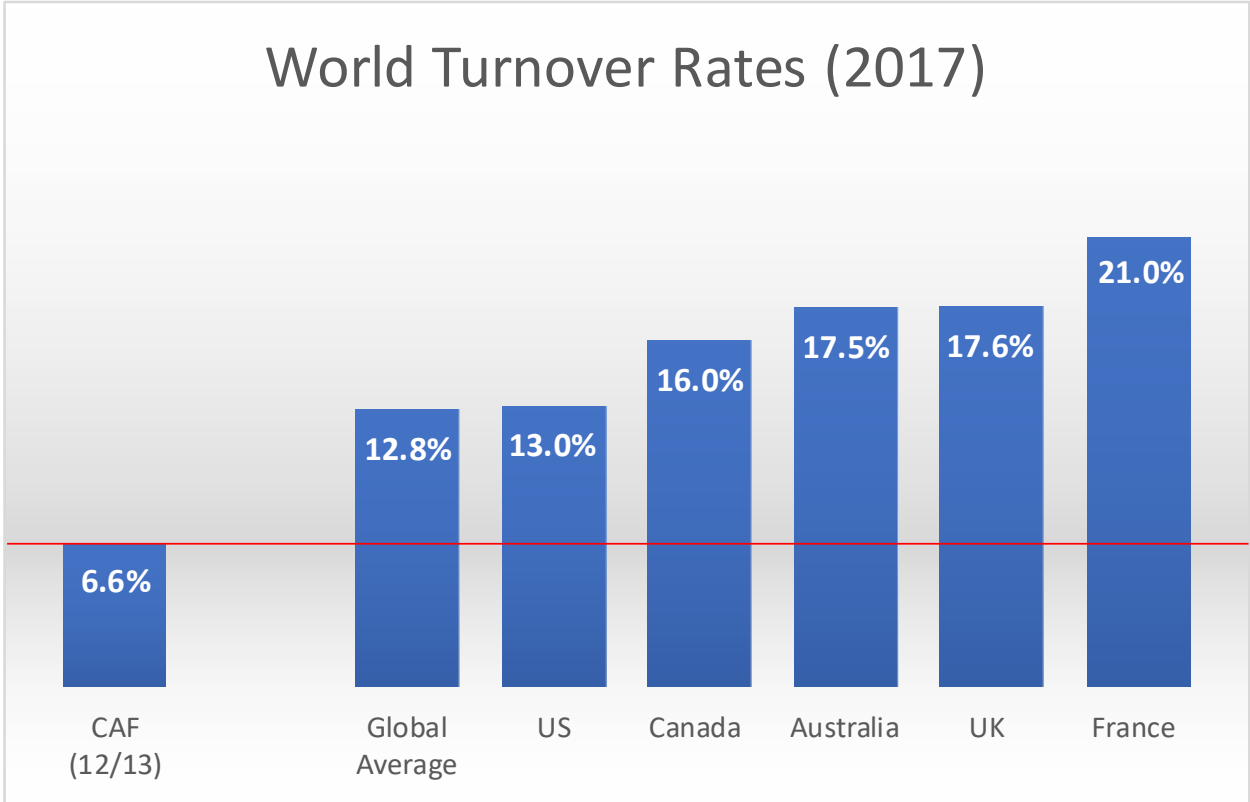


Figure 1.1. CAF Attrition VS. World Turnover Rates.¹⁸

¹⁷ HRReporter, “Canada Ranks 4th Globally for Highest Employee Turnover,” HHRReporter, May 15, 2018, <https://www.hrreporter.com/focus-areas/culture-and-engagement/canada-ranks-4th-globally-for-highest-employee-turnover/283061>.

¹⁸ HRReporter.

An additional comparison has also been made to the Canadian attrition rate from 2014 to 2020 based on the analysis made by the Conference Board of Canada.¹⁹ The results illustrated in Figure 1.2 show a Canadian turnover rate maintained between 11.5 and 13.5%. Again, the CAF's significantly lower rate seems to suggest a healthy level of attrition.

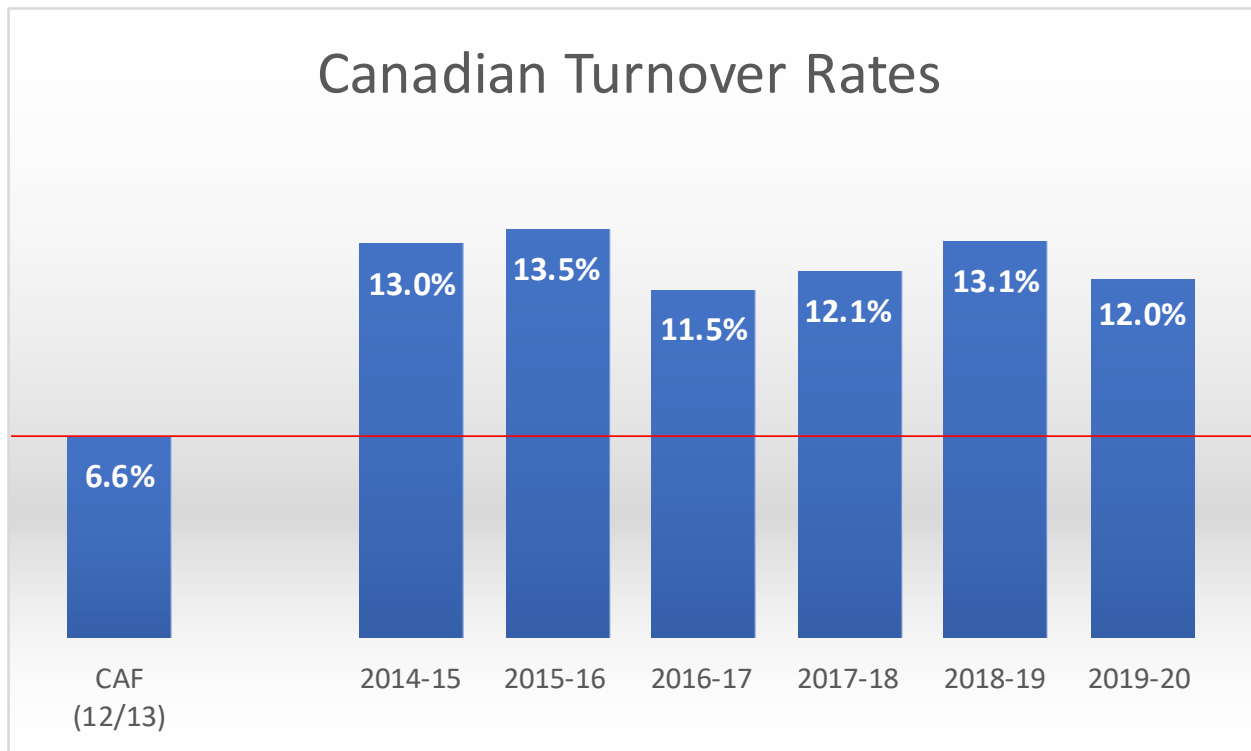


Figure 1.2. CAF Attrition VS. Canadian Turnover Rates.²⁰

A difference in the average Canadian turnover rate is present between the analysis of the Conference Board of Canada (Figure 1.2) and the one made by LinkedIn (Figure 1.1). This is expected and can be a consequence of differences in reporting methods and calculations. Still,

¹⁹ The Conference Board of Canada, "Talent-Trends," The Conference Board of Canada, accessed March 3, 2021, <https://www.conferenceboard.ca/e-library/abstract.aspx?did=10803>.

²⁰ Canada.

both measures remain in the same range and are considerably higher than the attrition rate of the CAF. Therefore, they can be considered as reinforcing evidence of the CAF's healthy level.

In an attempt to further validate this statement, Industries having the highest turnover rates have been compared to CAF attrition in Figure 1.3. These industries are those that are deemed causing the most human resource problems.²¹ In comparison, The CAF's attrition rate is considerably lower and may not be considered to be at a problematic level. Or, at least not problematic enough to be considered amongst the worst industries.

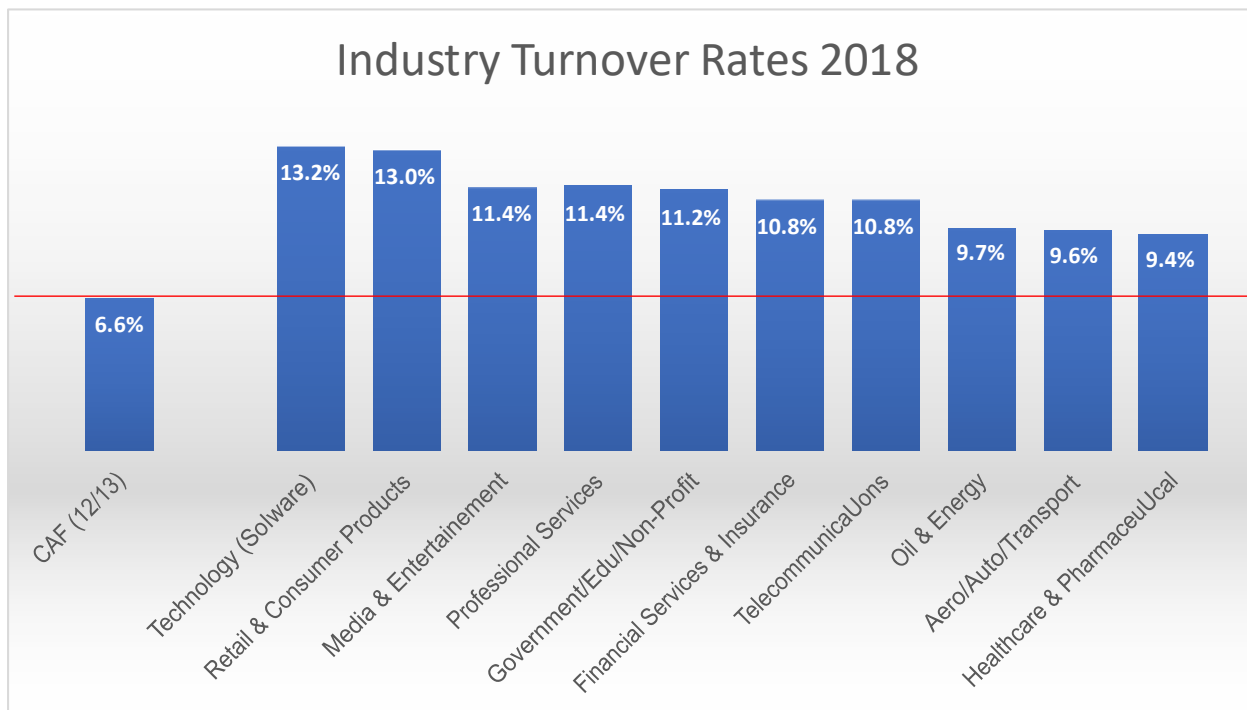


Figure 1.3. CAF Attrition VS. Canadian Turnover Rates.²²

²¹ "These 3 Industries Have the Highest Talent Turnover Rates," accessed March 3, 2021, <https://business.linkedin.com/talent-solutions/blog/trends-and-research/2018/the-3-industries-with-the-highest-turnover-rates>.

²² "These 3 Industries Have the Highest Talent Turnover Rates."

Finally, it is possible to further separate the data accumulated by the Conference Board of Canada and distinguish between private and public turnover rates (Figure 1.4).²³ From this, it is possible to see that the CAF's attrition level is comparable the Canadian public sector turnover rate which is not surprising since it is a part of it. Furthermore, both rates are significantly lower than the one associated to the private sector. Once again, from this comparison, it appears that the CAF's attrition rate is relatively healthy.

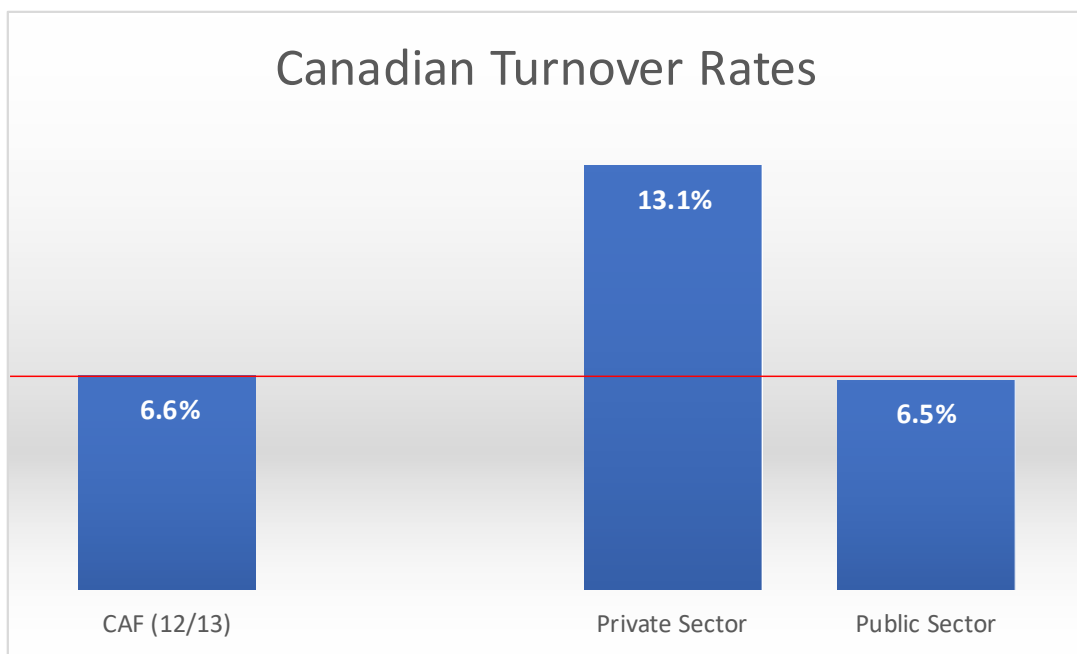


Figure 1.4. CAF Attrition VS. Canadian Turnover Rates.²⁴

When comparing the CAF's attrition level to commonly used turnover data in different forms, the CAF constantly ranks in the low range. This is suggestive of a healthy attrition level. This is also suggested in the 2019 CAF Regular Retention Survey's descriptive results when it is mentioned that the retention results are positive, and that the members' perception of work is

²³ Canada, "Talent-Trends."

²⁴ Canada.

also “moderately positive.”²⁵ And again, in the CAF retention strategy when it is said that “the CAF, overall, appears to have a good retention rate.”²⁶ When considering this information along with the fact that it is impossible for any organization to reach zero turnover, it is tempting to imply that the CAF’s attrition is not concerning. However, with this information it is impossible to state that the CAF does not experience a retention problem. The data presented in this section may simply suggest that the magnitude of the attrition problem of the CAF is relatively smaller than the one experienced in the developed world in general. However, it is only a generalization of the problem and does not consider the specificity of each situation. Furthermore, it is possible that these positive results can mask potential problem areas. In fact, the following sections will demonstrate that the particular characteristic in which the CAF is organized renders even a relatively low attrition rate into a considerable problem.

The CAF Need for HR

One of the costs of having a higher than desired turnover rate is the decrease of performance of the organization. As trained, talented and knowledgeable employees leave, less experienced workers remain which provokes a decrease in the quality of the organization’s output.²⁷ Daily task management along with team management becomes harder, productivity diminishes, and the company’s image may even suffer.²⁸ All of these are detrimental to an organization’s viability and may lead to the death of the organization. Of course, this is undesirable, but it is still a normal occurrence in a capitalist system. Higher than desired turnover

²⁵ Edward Yeung, Evanya Musolino, and Emrah Eren, “The 2019 CAF Regular Force Retention Survey: Descriptive Analysis,” *Defence Research and Development Canada (DRDC)*, 2019, 109.

²⁶ Chief of Military Personnel Strategy, Plans, and Policy, “CAF Retention Strategy (DRAFT),” 2021, 1.

²⁷ “Employee Turnover Rates: An Industry Comparison,” e-days Absence Management, July 30, 2019, <https://www.e-days.com/news/employee-turnover-rates-an-industry-comparison>.

²⁸ “Employee Turnover Rates.”

rate can have the same effect in the CAF. Where the CAF differ from civilian organization is in the fact that it cannot fail. The CAF need to constantly have a sufficient amount of trained personnel available to be able to act "Where and when it is in the national interest to intervene - to prevent aggression, respond to aggression, or to defeat aggressors."²⁹ Failure to do so will not only cause an existential risk to the CAF, but to the whole of the country as well since Canada's sovereignty is "founded on its ability to defend itself and to advance its vital interests outside its borders."³⁰ The CAF are Canada's tool of last resort, there is no other backup solution.

Therefore, it is essential that the CAF maintain sufficient strength to accomplish its missions.³¹ This, in turn, highlights why even a low attrition rate may be greatly problematic for the CAF. If left mismanaged, even low rates can cause a lack of necessary human resources, and this can cause an unacceptable mission failure.

Numbers of personnel have generally varied over the years. The full authorized strength of the CAF in 1965 was of 93,353 and augmented to 114,164 in 1970.³² However, after the end of the Cold War a massive downsizing effort occurred because of changes related to the international political climate and by the early 2000s, the allotment was reduced to 62,181.³³ In a 2002 report on Canadian Security and Military Preparedness, the Senate Committee on National Security and Defence evaluated that this number was insufficient. To be able to continue to

²⁹ Stuart Beare, "Defence Policy Review Considerations: Canada's Army," *Canadian Global Affairs Institute*, 2016, 3, https://www.cgai.ca/defence_policy_review_considerations_canada_s_army.

³⁰ Canada, Senate Committee on National Security and Defence, "Wounded: Canada's Military and the Legacy of Neglect Our Disappearing Options for Defending the Nation Abroad and at Home," 2005, 10, https://sencanada.ca/Content/SEN/Committee/381/defe/rep/repintsep05-e.htm#_Toc115156292.

³¹ Canada, Senate Committee on National Security and Defence, 11.

³² Canada, Senate Committee on National Security and Defence, 15.

³³ Jungwee Park, "A Profile of the Canadian Forces," no. 75 (2008): 14; Canada, Senate Committee on National Security and Defence, "Wounded: Canada's Military and the Legacy of Neglect Our Disappearing Options for Defending the Nation Abroad and at Home," 15.

complete the tasks that were asked of them over the last decade, the CAF would require a trained and effective strength of 75,000.³⁴ This, in turn, translates to a total strength of approximately 90,000 and indicates that the CAF is operating at around 45 percent below what is required. This was somewhat recognized as the CAF has since embarked on a transformation to increase personnel by 5,000 to a target of 68,000.³⁵ However, the difference in numbers remains staggering and may still be below what is truly required. By comparison, nearly 620,000 Canadian soldiers participated in WWI, 1.1 million in WWII, 25,000 in Korea, and 40,000 in Afghanistan.³⁶ This makes the 68,000 target appear low but because these were in different circumstances and in the case of Afghanistan spread out over many years with soldiers returning many times, they do not clearly indicate this fact, nor do they suggest a more appropriate number. However, this variance may suggest that it is difficult to determine the minimum force required to achieve what is asked of the CAF. Although there seem to be no simple equation that can precisely determine the minimum personnel requirement, in a situation where too little people may cause an existential problem, it is better to have more resources than not enough. Moreover, the facts listed earlier indicate that the CAF may not have the ample human resources required to face an existential threat.

Efficiency

³⁴ Canada, Senate Committee on National Security and Defence, “Wounded: Canada’s Military and the Legacy of Neglect Our Disappearing Options for Defending the Nation Abroad and at Home,” 16.e

³⁵ Canada, Government of Canada, “Chapter 2—National Defence—Military Recruiting and Retention,” 47; Canada, Government of Canada, “Report 5—Canadian Armed Forces Recruitment and Retention—National Defence,” 2.

³⁶ Canada, National Defence, “Military History,” navigation page, aem, September 21, 2015, <https://www.canada.ca/en/services/defence/caf/militaryhistory.html>; Canada, National Defence, “History & Heritage | Canadian Army,” February 25, 2013, <http://www.army-armee.forces.gc.ca/en/about-army/history.page>; McGill, “Military History of Canada,” accessed March 27, 2021, https://www.cs.mcgill.ca/~rwest/wikispeedia/wpcd/wp/m/Military_history_of_Canada.htm.

Another CAF particularity amplifies the effects of unhealthy attrition. This one is based in the desire for efficiency. In civilian markets, the need for efficiency is well known and abided to as it leads to survival in the face of competitiveness.³⁷ This concept has been transplanted into governmental entities including the military. Notably, the Liberal government has opted to make the military more lean and agile.³⁸ Putting aside for now the contradiction between lean structures and agility, rendering a military “lean” might cause problems for its effectiveness. Since war is uniquely risky and unpredictable, performance measures similar to competitive measures pushing private firms towards leanness do not transpose to a war environment.³⁹ Furthermore, any turnover issues in an already lean organization are bound to exacerbate any problems encountered. To better understand this effect, it is beneficial to look at the preferred manning levels of the CAF in comparison to the actual manning level, and the tasks it needs to accomplish. This has to be done under an efficiency context and considering a closed labour market.

As mentioned earlier, the minimum human resource need for the CAF is difficult to precisely determine. There is no clear answer to the needed requirements and as such, there is no obvious level of qualified personnel to maintain. This can largely be transposed to defence budget allocations since the main portion (37 percent) of it is allocated to personnel.⁴⁰ Here, again, there is no obvious level for defence expenditures, and in the stable geopolitical

³⁷ Leo J. Blanken and Jason J. Lepore, “Unpacking the Various Meanings of Redundancy: From Refining the Concept to Military Planning,” *Defense & Security Analysis* 28, no. 4 (December 1, 2012): 328, <https://doi.org/10.1080/14751798.2012.730721>.

³⁸ Lee Berthiaume, “Military Shrinks to Lowest Level in Years – and Could Shrink Further,” *Ottawa Citizen*, 2020, 3, <https://ottawacitizen.com/news/politics/military-shrinks-to-lowest-level-in-years-and-could-shrink-further>.

³⁹ Blanken and Lepore, “Unpacking the Various Meanings of Redundancy,” 328.

⁴⁰ Canada, National Defence, “Defence Budget,” navigation page, aem, March 11, 2021, <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/transition-materials/defence-101/2020/03/defence-101/defence-budget.html>.

environment of North-America having an alliance with the world superpower, it is easy for Ottawa to see great leeway in its resource allocation to the CAF.⁴¹ Of course, it is safe to assume that the government takes advantage of this margin as much as possible which constricts the resources of the CAF. Examples have occurred in the past when governments faced imposing debt and deficits levels and made cuts to planned expenditures. For example, the drop of the bid to acquire nuclear powered submarines from the 1987 defence policy and the cancellation of the Sea King helicopter replacement contract in the 1990s. The current COVID-19 situation and its detrimental monetary impact potentially causing up to one trillion dollars in debt will likely further impose resources constraints on the CAF. This is unlikely to change anytime soon as defence is a tempting reduction target for any government.⁴² In fact, many analysts agree that completing the planned procurement projects while maintaining the same staffing levels is?was unsustainable under the current budget.⁴³ The CAF must therefore function in an efficiency context.

Under an efficiency model, the CAF must utilize all its resources in the most productive way possible because there is a limit to the number of members it can have.⁴⁴ In a best case base scenario, the CAF would be allocated just enough resources to be able to accomplish its required mission. However, from a more realistic perspective, the unclear nature of the amount required and the corporate mind set of cost-cutting and stretch goals suggests that the allocation of resources to the CAF is probably lower than what it truly needs. Additionally, following the

⁴¹ Jeffrey F. Collins and 2020, “Defence Procurement Won’t Be so Easy to Cut in a Time of COVID-19,” Policy Options, accessed April 28, 2021, <https://policyoptions.irpp.org/magazines/may-2020/defence-procurement-wont-be-so-easy-to-cut-in-a-time-of-covid-19/>.

⁴² Collins and 2020.

⁴³ Berthiaume, “Military Shrinks to Lowest Level in Years – and Could Shrink Further,” 4.

⁴⁴ Canada, Government of Canada, “Chapter 2—National Defence—Military Recruiting and Retention,” 10; Blanken and Lepore, “Unpacking the Various Meanings of Redundancy,” 329.

efficiency model, that maximum level of workforce attribution is associated to a maximum expected work capacity. No more work can be squeezed out of the workforce since it already tends towards maximum productivity. Thus, any undesired attrition will be directly represented by a diminished work capacity. Because the resource allocation is exactly, or maybe even less than what is required to accomplish the CAF's mission, any reduction in the workforce attribution level may prevent the CAF from being able to do what it needs to do. Further amplifying this is the comparison between the preferred manning level (PML) and the trained effective strength (TES) of the force. Here, the PML can be considered as synonymous to the CAF's maximum personnel allocation and the TES as the actual available everyday workers. These two measures are displayed over time in Figure 1.5 and Figure 1.6. Prior to the 2000s, the TES is higher than PML which may be explained from the 1990s efforts to reduce workforce attribution levels. Those eventually switched to present a noticeable gap that is considerably large and long. This gap underlines a difficulty the CAF has in maintaining enough trained workers (TES) to meet the pre-established level required for its mission. The fact that the CAF is below the desired level of staffing is recognized and is also a problem felt in the Department of National Defence (DND) as they were also 2,200 civilian employees short of their target.⁴⁵ Undesired attrition widens the gap between PML and TES by lowering the latter. In essence, The CAF has, in the best case, just enough resource to accomplish its tasks. Any attrition would cause problems, but the effects are even more important considering TES is already lower than desired. Thus, it is clear that even a small attrition level could have the potential of causing a considerable impact.

⁴⁵ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 21; Berthiaume, "Military Shrinks to Lowest Level in Years – and Could Shrink Further," 4.

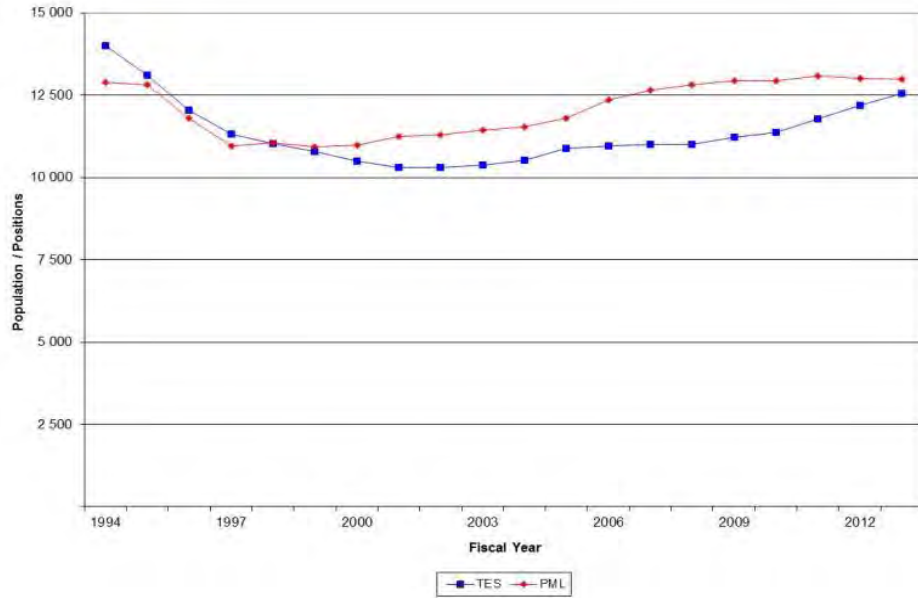


Figure 1.5. Officer TES versus PML⁴⁶

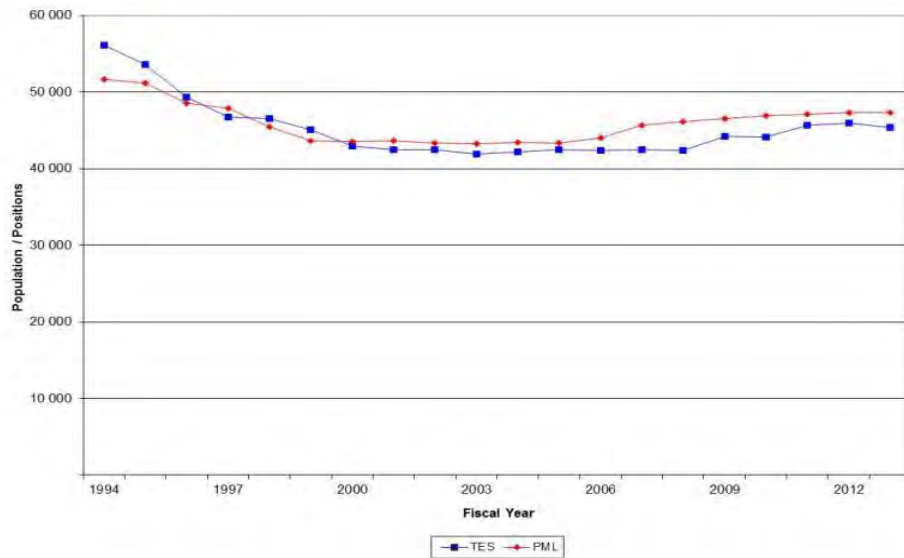


Figure 1.6. Non-Commissioned Members (NCM) TES versus PML⁴⁷

⁴⁶ Canada, Military Workforce Modelling & Analysis Team, “Annual Report On Regular Force Personnel 2012/2013,” 41.

⁴⁷ Canada, Military Workforce Modelling & Analysis Team, 42.

Closed Labour Market

Attrition is further exacerbated by the fact that the CAF sources its personnel from a closed labour market. A rigorous recruitment process ensures the personnel joining the CAF have the required predetermined characteristics i.e., the physical, cognitive, social, technical and leadership skills to accomplish the uncommon CAF mandated tasks. However, those personnel enter the CAF at the bottom of the pyramid. They are then selected, trained and promoted from within.⁴⁸ Every new member of the CAF needs to go through this process. There is no sideways recruitment in the sense that it is improbable to see a retired civilian CEO take command of one of the CAF brigades without having to go through the required years of experience. This is in part due to the fact that the CAF is composed of highly specialized groups who operate in very small communities of practice which requires extensive education, training and CAF based experiences.⁴⁹ The depth of knowledge needed in those particular areas are not held in the civilian population. For example, an infantry officer skilled in the tactics of maneuver warfare is not readily available outside of the military. Furthermore, the hierarchical base of the military is built on a model to create generalist leaders; generals, in other words. To reach this level, one requires breadth of experience to understand how the different portions of the military functions. This type of experience is not available in the civilian environment, once again, making sideways recruitment difficult. Consequently, it takes vast amounts of time and resources to prepare military personnel for their job. And hence, any undesired attrition cannot be immediately

⁴⁸ Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 8.

⁴⁹ Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)"; Canada and Department of National Defence, *Strong Secure Engaged*.

replaced from sideways recruitment, but rather must be pulled from a different level of the CAF. Of course, this creates a subsequent new vacancy which must go through the same process to be filled. Then, this cycle continues until it reaches the bottom of the hierarchical pyramid. Because of this closed market, attrition causes a wave of an upward pull. Clearly, too much attrition at once may cause a bubble where there is not enough trained and experienced personnel to fill the gap. Accordingly, this can have an even more devastating effect in key specialized areas where skilled labour is not abundant. This highlights the need to anticipate attrition as much as possible in order to mitigate a bubble or at least to pre-emptively recruit enough to compensate for it through overstaffing.⁵⁰ The demographic bulge of retiring baby boomers and gen X for example, will soon create considerable gaps that must be considered early in order to properly react to it. In summary, the closed labour market environment of the CAF forces attrition to be compensated by an upwards pull resulting in the costly need to recruit, train, and have those new members acquire enough experience to replace a leaving member. This procedure is longer and more expensive than what may be done on the civilian side and helps understand why attrition in the CAF is a considerable issue⁵¹.

Redundancy

Based on the earlier mentioned efficiency concept, the CAF's workforce is operating at maximum expected effectiveness. And, according to Blanken and Leopore "this effectiveness level cannot be increased without increasing resources or improvements in technology."⁵²

Therefore, adding additional tasks to the CAF without additional resources is bound to cause

⁵⁰ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 10.

⁵¹ There are some exception areas where direct entry can be considered. This can occur in specialty areas like the chaplains, lawyers, medical trades for example.

⁵² Blanken and Lepore, "Unpacking the Various Meanings of Redundancy," 329.

problems. Moreover, the lack of human resources already identified in previous sections suggests that the tasks that would have been allocated to that workforce are either incomplete or redistributed to the remaining employees. Task incompleteness is a serious detrimental effect in itself but, more importantly, the reassignment of tasks to employees already at maximum effectiveness causes an overwhelming workload.⁵³ Indeed, CAF members have expressed in recent surveys that they frequently experienced role overload along with occasional role conflict.⁵⁴ This generally means that members have been overworked and on occasion have experienced conflict between work priorities.⁵⁵ Compared to the general population, these results demonstrate that CAF members experienced higher life and job dissatisfaction.⁵⁶ In a situation like this, any undesired attrition would worsen the already non-ideal situation. However, redundancy would alleviate the impact of the friction caused from the lack of an optimum number of employees.

Redundancy is a way to provide flexibility and security by means of providing another resource capable of completing the task when the first one failed.⁵⁷ In a way, it is similar to an insurance policy. It might not be in line with the concept of efficiency but ensures survivability in the same way humans have two kidneys to maintain important health function if one started to not function properly. This concept is important in the face of uncertainty. Thus, it is extremely important for a military as war is riddled with uncertainty.

⁵³ Michael Cocolakis-Wormstall, "Labour Shortage: Here to Stay," September 2018, 8, https://www.bdc.ca/en/documents/analysis_research/labour-shortage.pdf.

⁵⁴ Yeung, Musolino, and Eren, "The 2019 CAF Regular Force Retention Survey: Descriptive Analysis."

⁵⁵ Yeung, Musolino, and Eren.

⁵⁶ Park, "A Profile of the Canadian Forces," 24.

⁵⁷ Blanken and Lepore, "Unpacking the Various Meanings of Redundancy," 338.

Nassim Taleb brings interesting views on uncertainty in his 2010 book *Black Swan*. In it, he states that many are subject to the illusion of understanding the world, whereas in reality it is far too complicated and random to really know.⁵⁸ This is largely aligned with military thinking and risk as “Military thinkers and practitioners are understandably concerned about uncertainty that is generated on the battlefield.”⁵⁹ *Close Engagements*, a CAF doctrine document about land power in an age of uncertainty, notes that “the diverse and varied ends, ways and means employed by adversaries are likely to lead to rapid changes in the character of conflict” and that the “adversary will find clever ways to avoid our strengths and attack our vulnerabilities.”⁶⁰ Therefore, there is a considerable level of unpredictability to future conflicts. This uncertainty provokes the possibility of failure at war and causes an existential threat to the country. Accordingly, it is important that this unpredictability be mitigated against affecting the nation’s survivability. And one way to do so is through redundancy as “redundant forces may serve to mitigate risk of failure, in a manner akin to the concept of diversification of investments in finance.”⁶¹

The concept of redundancy is in opposition to the one of efficiency. However, as previously demonstrated, it is essential to the survivability of a military and its associated state. To answer to unforeseen events, some extra flexibility forces are required but the CAF does not

⁵⁸ “The Black Swan: Second Edition: The Impact of the Highly Improbable: With a New Section: ‘On Robustness and Fragility’: Taleb, Nassim Nicholas: 8601404990557: Books - Amazon.ca,” accessed December 28, 2020, https://www.amazon.ca/Black-Swan-Improbable-Robustness-Fragility/dp/081297381X/ref=sr_1_1?crd=3QW30Y7MWHX7V&dchild=1&keywords=the+black+swan&qid=1609166878&srefix=the+bla%2Caps%2C208&sr=8-1.

⁵⁹ Blanken and Lepore, “Unpacking the Various Meanings of Redundancy,” 333.

⁶⁰ Canada and Department of National Defence, *Close Engagement: Land Power in an Age of Uncertainty: Evolving Adaptive Dispersed Operations*, 2019, http://epe.lac-bac.gc.ca/100/201/301/weekly_acquisitions_list-ef/2019/19-37/publications.gc.ca/collections/collection_2019/mdn-dnd/D2-406-2019-eng.pdf.

⁶¹ Blanken and Lepore, “Unpacking the Various Meanings of Redundancy,” 333.

have enough forces for the tasks already on hand even before considering additional tasks. This highlights a considerable stretch in personnel which makes it highly vulnerable to attrition.

Although the idea of unforeseen existential threat is difficult to imagine in a stable environment, many unexpected events have recently caused an extra burden to the CAF. In fact, an increasing number of unanticipated events have occurred in the near past that required the intervention of the CAF. Many may be related to climate change such as the recurring floods and forest fires, but some were truly surprising such as the reaction to COVID-19. No permanent workforce is allocated to those additional tasks. Nevertheless, the CAF have always answered the call to action.⁶² But this comes with an elevated cost to the force. When there is an urgent call for action, the force, already at maximum effectiveness, must react in one of two ways. Stop their current task to react to the emergency, which puts the country at risk to not be ready to face an existential threat. Or try to take on both workloads at the same time, which will result in task overload and exhaustion. Both scenarios have detrimental effects. In the event of a domestic disaster, the Canadian population rightly expects the CAF to respond quickly, but this requires a sufficient amount of trained personnel.⁶³ These domestic emergencies have been occurring at an increasing rate making the need for a larger and redundant force more important. In turn, this augmenting need in personnel highlights how any undesired attrition would further aggravate the problem.

In summation, the CAF are allocated the bare minimum of resources to complete their core tasks. However, they are also called upon to respond to unforeseen emergencies. These

⁶² Canada, Senate Committee on National Security and Defence, “Wounded: Canada’s Military and the Legacy of Neglect Our Disappearing Options for Defending the Nation Abroad and at Home,” 12.

⁶³ Amanda Huddleston, “Canadian Armed Forces Retention: A Wicked Problem?,” August 26, 2020, 11, <https://mspace.lib.umanitoba.ca/xmlui/handle/1993/34939>.

situations pile on additional tasks to the already stretched out force which causes further exhaustion or an existential threat to the nation. In order to have resilience and agility to face these extra tasks, redundancy needs to be built into the workforce. Evidently, any undesired attrition will impede any effort of gathering a workforce big enough to face the increase in tasks, thus reducing institutional flexibility.

Return on Training Investment

Attrition also has a perverse effect on the return made on invested for the training of a soldier. The CAF employs a particular set of skills and knowledge that are usually not available to the general public.⁶⁴ For this reason, the CAF needs to provide extensive and specific training to any new recruit as they will not have the necessary skills upon joining the force. Of course, this training is expensive in time, money, and personnel.⁶⁵ Additionally, education and training levels have increased over the past decade.⁶⁶ A Bachelor's degree has become mandatory for officers and professional diplomas along with specialized training have been strongly encouraged throughout the force. This further increases the value of the investment. Because this investment is so large, the loss of a fully trained member comes at an elevated cost. As such, turnover is intimately linked with the lost cost of training.⁶⁷

Depending on occupation, the cost of losing a member early may vary which will have an impact how much time the member should serve in order to be beneficial to the CAF.⁶⁸

⁶⁴ Yeung, Musolino, and Eren, "The 2019 CAF Regular Force Retention Survey: Descriptive Analysis."

⁶⁵ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 23; Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)"; Huddleston, "Canadian Armed Forces Retention," 35.

⁶⁶ Park, "A Profile of the Canadian Forces," 24.

⁶⁷ Russell, Humphreys, and Wakerman, "How Best to Measure Health Workforce Turnover and Retention."

⁶⁸ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 23.

However, about one third of most occupational groups recruited had left the forces after only seven years of service.⁶⁹ For example, a combat engineer's training cost covering up to his fourth year of service is about \$220,000 but the attrition level in this group will see about 35 percent of their recruits leave after four years.⁷⁰ Considering a group of 100 new combat engineers, the loss from attrition amounts to roughly \$8 Million. This is immediately after training and without having been able to benefit from these members' service. Any retention effort in this case would have at least avoided this pure loss and turn it into a work output. Of course, the longer this output the better the return for the CAF. A parallel can be made with the training cost of pilots, which is considerably higher, as are the benefits of actively retaining them. In 2018, for example, the US Air Force decided to abandon retention efforts to instead concentrate more on production.⁷¹ This was made in part as a bet that the aviation industry would lose attraction power, providing more negotiating power to the US Air Force and naturally reducing turnover. Unfortunately, this was a bad bet for two reasons. Firstly, although COVID-19 did cause a great reduction in air travel, government bailouts and subsidies allowed the industry to retain and even recruit new pilots cancelling out the advantage the US Air Force thought it had. Secondly, and more importantly, the cost of training pilots is incredibly high. It ranges from \$7.3 million for a single B-1 pilot to \$10.9 million for an F-22 pilot.⁷² Considering this, RAND conducted a study and found that "from a personnel cost perspective, it is more cost-effective for the US Air Force to increase special and incentive pay and retain pilots than to expand the training pipeline to

⁶⁹ Canada, Government of Canada, 23.

⁷⁰ Canada, Government of Canada, 23.

⁷¹ Brian Kruchkow and Tobias Switzer, "The USAF's Bad Bets on Pilot Retention Show It Needs Outside Help," Government Executive, accessed April 27, 2021, <https://www.govexec.com/defense/2021/04/usafs-bad-bets-pilot-retention-show-it-needs-outside-help/173475/>.

⁷² Michael G. Mattock et al., "The Relative Cost-Effectiveness of Retaining Versus Accessing Air Force Pilots," March 27, 2019, 12, https://www.rand.org/pubs/research_reports/RR2415.html.

sustain a given pilot inventory.”⁷³ This important fact that retention is more cost-effective than production is widely accepted and reinforced by the Canadian Auditor General and the CAF’s “Strong, Secure, Engaged” (SSE) policy.⁷⁴

Finally, retention has a particular importance over production as it prevents the loss of corporate knowledge. After working many years in an organization, employees develop a deep understanding of its functioning and develop ways of navigating its work in efficiently. This is a valuable advantage that cannot be reproduced in the production of new recruits but rather takes years of experience. Thus, it is important to preserve corporate knowledge to maintain this advantage for as long as possible. Consequently, it is equally important to prevent undue attrition of employees that possess that corporate knowledge.

The choice of departure; voluntary vs. involuntary attrition

At this point, it is important to break from the main discussion to look at the mechanism of departure with greater attention. There are two ways to exit the military, voluntarily or from a decision of the organization. Both create attrition but, depending on the situation, may be desired or not. Indeed, as the Auditor General notes, “a certain level of attrition is needed to sustain an ideal balance of new and experienced personnel.”⁷⁵

Involuntary releases can further be subcategorized by underperformers, medical releases, and those who have attained the mandatory retirement age. Much of the Auditor General’s

⁷³ Mattock et al., 16.

⁷⁴ Canada, Government of Canada, “Report 5—Canadian Armed Forces Recruitment and Retention—National Defence,” 20; Canada and Department of National Defence, *Strong Secure Engaged*, 21.

⁷⁵ Canada, Government of Canada, “Report 5—Canadian Armed Forces Recruitment and Retention—National Defence.”

“needed attrition” should be composed of involuntary releases; they are those whom the CAF ordered to leave after all. This is clear in the case of under performers and members with bad behaviour. For those at the mandatory retirement age, however, it is less evident. As life expectancy increases, this serving limit could be modified, or retirees could transition in other tasks to the benefit of the organization. Still, this is the ideal attrition, or retirement moment from the CAF’s perspective. As for medical releases, the CAF does have a specific set of health requirements which must be met to be able to face the dangers of war effectively. As such, individuals not meeting the standard cannot continue their service as fighting members. However, there lies here an opportunity to continue to employ those members within their limitations in more administrative non-war roles thus reducing the burden and overload of tasks of other members⁷⁶. Since medical releases account for 24 percent of Non-Commissioned Members (NCM) and 10 percent of officers, reducing this type of attrition would have a significant impact.

As voluntary releases are voluntary on the part of the member, they are a vastly undesired event on the part of the CAF. Accordingly, it is in this section that most of the retention problem presents itself. In fact, the retention problem may be defined as: “the unsustainable attrition rate of fully qualified trades' members choosing to exit the CAF prior to their mandatory retirement age.”⁷⁷ Therefore, healthy retention can be described as keeping members who have the talent and capabilities to support the CAF’s mission on continued

⁷⁶ The universality of service principle applied by the CAF determines that each member must maintain a minimum operational standard to remain in the regular or primary reserve force. Failing to meet this standard results in the release of the member. Thus, a medical condition that prevents a member from meeting the standard provokes an early release. There is a possibility to retain a member on employment limitations, but only temporarily and on a transitional basis that lasts a maximum of three years.

⁷⁷ Huddleston, “Canadian Armed Forces Retention,” 34.

employment until mandatory retirement.⁷⁸ However, there is a caveat. Notwithstanding the effect on attrition, some members may realize that they do not share the values of the CAF and that this career choice is not a good fit for them. Those cases may also be considered as part of the Auditor General's "needed attrition" as they may poorly influence the group. Hence, an addition to the definition of healthy attrition may incorporate emphasis on retaining the right personnel, or in other words, members who are engaged and committed to the organization.⁷⁹ In fact, many experts agree that committed employees offer better performance, increased effort, and less absenteeism than their counterparts.⁸⁰ Thus, the issue at the base of the retention problem is the choice of leaving from a member that the CAF would prefer to stay.

Although the previous statement may sound obvious, it emphasizes the choice present at the core of it all. This choice is one that only the member in question can make. While making this choice, the member greatly considers their own values and interest. Members join for a variety of reasons they hold dear such as career aspiration, job security, adventure, etc. which they reevaluate while making their decision⁸¹. Additionally, the CAF can only influence it by the offer they are providing. A great portion of this is achieved through the culture it projects and lives.⁸² However, it gets somewhat more complex as any other employment offers can equally influence the member's choice. Many private firms offer higher salaries, which can be very attractive in luring CAF members to their team.⁸³ Furthermore, once the member has joined the

⁷⁸ Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 1.

⁷⁹ Yeung, Musolino, and Eren, "The 2019 CAF Regular Force Retention Survey: Descriptive Analysis," 265.

⁸⁰ Yeung, Musolino, and Eren, "The 2019 CAF Regular Force Retention Survey: Descriptive Analysis."

⁸¹ Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 3.

⁸² Daniel Chait and Jon Stross, *Talent Makers: How the Best Organizations Win through Structured and Inclusive Hiring*, 1st edition (Hoboken, New Jersey: Wiley, 2021), 90; Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 3.

⁸³ Huddleston, "Canadian Armed Forces Retention," 82.

force, they constantly re-evaluate their choice and may decide to release at any time, taking into account contract constraints obviously. That means that the CAF is constantly at risk of suffering from unhealthy attrition.

In sum, the CAF wishes that every productive, committed and engaged member remains in the organization until mandatory release. However, it suffers when those members exit prematurely, especially when it is due to a reason intrinsic to the CAF and its culture. Of course, a members values may change, or they may be lured by external organizations, which is outside of the CAF's control. But when the CAF's own culture and policy are the reason for the departure, and it could be avoided, that is problematic. Manifestations of these issues demonstrate an underlying attrition problem. Event if the CAF has a low general attrition level, if a certain portion of the CAF's culture pushes away members, then a problem is clearly present. It is those issues that will be looked at in the following sections.

General Sources of Dissatisfaction

In order to gain better insight into the retention issue, a survey was conducted with the aim of identifying key reasons or sources of dissatisfaction that would tilt towards the decision to leave the CAF. This survey is administered to serving member and questions their possible intent of leaving. The results of this survey are illustrated in Figure 1.7 highlighting the main reason cited for an eventual departure from the CAF. Furthermore, Figure 1.8 shows the seven most cited themes in relation to their influence on a member's decision to remain in the CAF. In other words, it underlines the importance members allocates to each theme when taking the decision to stay or leave. Additionally, a survey is also taken upon the release of members to identify their reason for leaving, the results of which are illustrated in Figure 1.9.

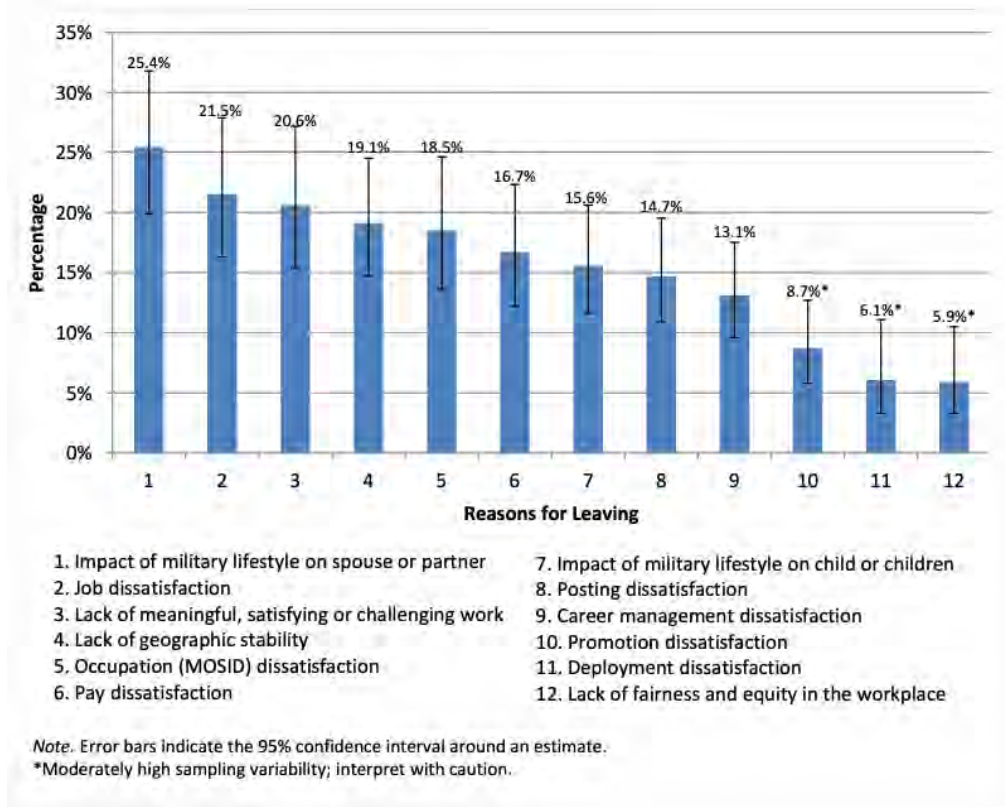


Figure 1.7: Main reasons for leaving the CAF (serving members).⁸⁴

⁸⁴ Yeung, Musolino, and Eren, “The 2019 CAF Regular Force Retention Survey: Descriptive Analysis,” 21.
 31/72

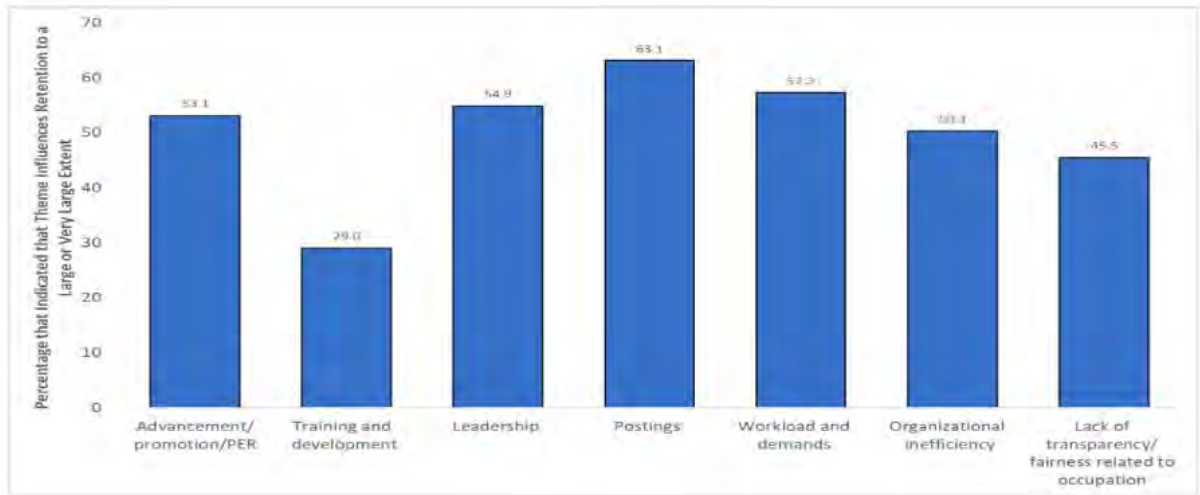


Figure 1.8: Percentage of respondents indicating that the seven most commonly cited sources of dissatisfaction regarding CAF occupation influenced their decision to stay in the CAF to a large or very large extent.⁸⁵



Figure 1.9: Main reasons for leaving the CAF (leaving members).⁸⁶

⁸⁵ Vanessa Myers et al., “The 2019 CAF Regular Force Retention Survey: Qualitative Analysis” (Defence Research and Development Canada, 2019), 61.

⁸⁶ Chief of Military Personnel Strategy, Plans, and Policy, “CAF Retention Strategy (DRAFT),” 51.

Upon looking at the three surveys, it is possible to see that much of the same themes are appearing on each of them. It is possible also to reorganize most of the highest ranked themes in three larger categories: postings, workload, and leadership. The first category, postings, includes the location of the posting, the qualitative nature of the job itself, and the potential for promotion as they are all intertwined. Workload, the second, is relevant to the amount of work output required and the associated level of exhaustion. And finally, the third refers to the quality of senior leaders, their guidance and transparency. Organizing the themes along the three main categories allows one to see the clear dominance in importance of the posting characteristic (Table 1.1). In fact, in a way, the other two can also be expressed as a factor of postings; workload and senior leaders may vary depending on your job.

Table 1.1 Regrouping of the dissatisfaction themes into three main categories

Category	Reasons for leaving (serving members)	Relative importance accorded in decision	Reasons for leaving (leaving members)
Postings	#1 – Impact on spouse #2 – Job dissatisfaction #3 – Lack of satisfying work #4 – Lack of geographic stability #5 – MOSID dissatisfaction #7 – Impact on child #8 – Posting dissatisfaction #9 – Career mgmt dissatisfaction #10 – Promotion dissatisfaction #11 – Deployment dissatisfaction #12 – Lack of fairness	#1 – Postings #4 – Advancement, Promotion, PER #5 – Lack of transparency	#1 – Job dissatisfaction #2 Geographical stability #3 – Career progression #4 – Postings #6 – Lack of meaningful work
Workload	#2 – Job dissatisfaction	#2 Workload and demands	#1 – Job dissatisfaction
Leadership	#12 – Lack of fairness	#3 – Leadership #4 – Organizational inefficiency #5 – Lack of transparency	#5 – Senior leadership

The analysis from the Auditor General and other experts seem to highlight the same sources of dissatisfaction: impact on family, job dissatisfaction, career management – working conditions and arduous workload, work stress and job dissatisfaction – lack of direction and dismal communications, lack of fairness.⁸⁷ Again, it seems to be possible to categorize these sources of dissatisfaction in the same fashion. Attention should be maintained on postings as it has a considerable impact. In fact, in addition to the current dissatisfaction surrounding postings, up to 20.8 percent of the CAF would not accept a posting that would detrimentally impact their spouse’s employment.⁸⁸ Accordingly, mismanaging postings may provoke a very large negative impact on retention. However, it is important not to forget the two other categories. Work overload was already discussed in this paper and was found to impact effectiveness and retention.⁸⁹ And the lack of confidence in senior leaders is currently highlighted in the highly mediatized sexual misconduct crisis and the "do-as-I-say, not-as-I do" attitude of those leaders.⁹⁰ LGen. Wayne Eyre, the acting Chief of the Defence Staff and commander of the Canadian military, has noted the situation to be "an existential issue" for the CAF because an “all-volunteer force can't expect civilians to sign up if they don't trust the chain of command” clearly highlighting the relation with unhealthy attrition.⁹¹ As such, these three categories of social policy issues clearly demonstrate the presence of sources of dissatisfaction that provokes unhealthy attrition. Unfortunately, these irritants have remained largely unchanged over the past

⁸⁷ Canada, Government of Canada, “Chapter 2—National Defence—Military Recruiting and Retention,” 22; Park, “A Profile of the Canadian Forces,” 24; Huddleston, “Canadian Armed Forces Retention,” 36.

⁸⁸ Jason Dunn, Samantha Urban, and Zhigang Wang, “The Impact of Spousal Employment on Military Personnel Career Decisions” (Director General Military Personnel Research and Analysis, Department of National Defence, Canada, 2013), 151.

⁸⁹ Cocolakis-Wormstall, “Labour Shortage: Here to Stay,” 3.

⁹⁰ Murray Brewster, “The Military’s Sexual Misconduct Crisis Is Turning into a National Security Problem, Say Experts | CBC News,” CBC, April 1, 2021, <https://www.cbc.ca/news/politics/military-sexual-misconduct-1.5971495>.

⁹¹ Brewster.

three decades and are still unresolved.⁹² However, research suggests that flexible arrangements may be useful in the development of possible mitigation.⁹³

Subgroup Attrition

Up until now, it has been demonstrated that although the general attrition level is low, some general issues still demonstrate how retention is a problem for the CAF. However, the general attrition image of the CAF changes as the magnifying glass is placed on the different demographics, occupations, and subgroups present in the organization. Evidently, the experience and demands of an infantry soldier differ greatly from those of a naval logistician. Similarly, the forces that influence a decision to stay or leave the forces will also vary in the same way. By looking at smaller sections, it is possible to uncover additional arguments demonstrating the CAF's retention problem.

The first and most evident sub-separation is apparent in the differences between operational trades. Actual attrition varies considerably between trades with some reaching high levels.⁹⁴ Such as ?In addition, 26 trades have experienced between five and ten percent vacancies.⁹⁵ This is a considerable issue that denotes that any attrition whatsoever would greatly exacerbated the ineffectiveness of a capability group already unable to reach its objective. Moreover, 23 to 24 occupational trades have been deemed "stressed" and have been subject to an attrition rate over ten percent.⁹⁶ This put those groups at least 3.4 percent over the CAF average

⁹² Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 4.

⁹³ Yeung, Musolino, and Eren, "The 2019 CAF Regular Force Retention Survey: Descriptive Analysis," 147.

⁹⁴ Canada, Government of Canada, "Report 5—Canadian Armed Forces Recruitment and Retention—National Defence," 20.

⁹⁵ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 10.

⁹⁶ Canada, Government of Canada, 10; Berthiaume, "Military Shrinks to Lowest Level in Years – and Could Shrink Further," 3; Huddleston, "Canadian Armed Forces Retention," 40.

and closer to industries with higher turnover such as telecommunication, media, and technology. Additionally, a total of 44 trades have seen more people leave their group than joining.⁹⁷ From this, it seems clear that, although the CAF's attrition average is relatively low, the occupations at the highest extremity of this average are problematic. Some of the trades that compose high attrition groups are also hard to recruit, such as naval technicians, signallers, pilots, maritime operations specialists, medical occupations, and pharmacists.⁹⁸ Likewise, those trades represent critical capabilities that, if not manned to effectiveness, may inhibit the CAF from achieving its mission. Finally, each of these subgroups sees different forces influencing their decision to remain or leave the CAF. For example, pilots may experience some of the dissatisfactions of the CAF environment like impact on family and increased workload. At the same time, they may be having the strong internal valued desire for flying while on non-flying duties. All this while being lured by the industry with large salaries.⁹⁹ These influences will evidently not be the same for occupations other than the pilot trade but each of the stressed occupations will have its own unique set of issues that contribute to increased attrition.

⁹⁷ Alistair D. Edgar et al., *Strengthening the Canadian Armed Forces through Diversity and Inclusion*, Book, Whole (Toronto; Buffalo; University of Toronto Press, 2019), 13, http://cfc.summon.serialssolutions.com/2.0.0/link/0/eLvHCXMwbV07T8MwED7RdgExUB5qeFQWA1tL4iTUHtuqhaUMCIFgiRw_EKJKpbRF4t9zZxJUUabIsqw45_g--3zfZ4CY98PeH5-AIO0cra1lwtWN1tJZnphe6cjAQ-dZ5MIs9fBw0y8VJpJRI3RTvcpldGUOPe94_aEimuEqQSB4GbrZA3oTUcjkZPv7EVWlBLWHOel6CDujRN6wInLkqt9VRVhhtlqkeg2VPLD_Qy6IFWS4Qd7MeWs_YIND2AliVaQht2bHEInZkX1y6_2BW7V_izsGqOHsEtnTMXbyRqgKjE8MlqBQKGo2oNmy5KdA6suqGHmTozg6nCsPdCz9cUQTuGYDp5HN_1sFNZFeTJItJpEfEJ7CvKjC9WnkFnOsASp4Uz1nKhTBLnSmoSjc-dznUoXCQCUNz41uxz7k9pl1ltENyARDKA9vbbAmC1RTLfqMonzSajcSrpBrPB6X_tzmAXlx3yJ5BxDs1VubYX3sbdaiS70HjmyTfEMaHh.

⁹⁸ Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 49; Canada, Senate Committee on National Security and Defence, "Wounded: Canada's Military and the Legacy of Neglect Our Disappearing Options for Defending the Nation Abroad and at Home," 78; Huddleston, "Canadian Armed Forces Retention," 59.

⁹⁹ Kruckow and Switzer, "The USAF's Bad Bets on Pilot Retention Show It Needs Outside Help," 11.

Another subdivision analysis possibility is through gender, which is of particular interest partly because the government intends to augment the representation of women in the CAF to at least 25.1 percent within 10 years.¹⁰⁰ As was the case with occupations, gender is represented differently throughout the CAF which will have different influences on their decisions. Women, for example, chose the airforce in larger proportion than men (30 percent vs. 24 percent respectively) while 33 percent of men chose the combat arms profession compared to only 11 percent of women.¹⁰¹ Also, women tend to be concentrated more in support jobs such as medical, dental, logistics, and intelligence.¹⁰² The LGBTQ+ community will most definitely have a distribution and influence of their own. In the case of women, job strain seems to be one of the major sources of dissatisfaction which may be linked to the large proportion of household responsibilities they also hold.¹⁰³ In fact, COVID-19 placed a strain on all families because of the lack of childcare forcing one of the parents to leave work, and that parent has often been the mother.¹⁰⁴ Another particularity pertaining to women presents itself as a considerably high level of attrition after they have reached 20 years of service.¹⁰⁵ A plausible explanation for this can be based in service couples. After 20 years of service, military personnel tend to have reached a high level of seniority. In a service couple of that level of seniority, it would be increasingly difficult for both partners to hold a senior job on the same base. Thus, this would provoke the premature release of one of the partners, which, in this case, seems to be women more often than men. Further research would be required to better understand this unhealthy attrition in service

¹⁰⁰ Canada, Government of Canada, “Report 5—Canadian Armed Forces Recruitment and Retention—National Defence,” 21.

¹⁰¹ Park, “A Profile of the Canadian Forces,” 18.

¹⁰² Park, 18.

¹⁰³ Park, 24.

¹⁰⁴ Chief of Military Personnel Strategy, Plans, and Policy, “CAF Retention Strategy (DRAFT),” 6.

¹⁰⁵ Chief of Military Personnel Strategy, Plans, and Policy, 47.

couple. In contrast, in non-service couples, the main source of unhealthy attrition is related to the economic impact on the nonmilitary partner. Here again, each subgroup has its own particularity that must be considered in the analysis of attrition.

Attrition of new recruits while still in the training is also considerable. It is evaluated that up to 28 percent voluntarily leave within the recruitment and training process and even more leave within the first year of enrolment.¹⁰⁶ This seems to be associated to the lengthy recruitment and training process. Delays in this phase are considerable and regularly reach between 90 days to a year.¹⁰⁷ These waiting times are a significant source of dissatisfaction for this group and contribute to the lack of sufficient trained members in the CAF.

Lastly, it is worth mentioning the case for medical attrition even if it is not part of voluntary releases as they constitute a large portion of total attrition levels. Indeed, approximately one quarter of the total NCM attrition is attributable to medical releases.¹⁰⁸ What is worrying is that this number is on the rise since 2001. Although this type of attrition is ordered by the CAF, in contrast to individuals of poor performance, individuals releasing for medical reasons do so after an involuntary injury. In other words, if it weren't for an unintentional injury impeding on universality of service terms, the CAF would gladly retain the member as they are otherwise productive. Thus, this situation appears to be a low-hanging fruit. If the injured member can still work in a non-war context, he could be retained in that function allowing other resources to be freed up for mission critical tasks.

¹⁰⁶ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 16; Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 46.

¹⁰⁷ Canada, Government of Canada, "Report 5—Canadian Armed Forces Recruitment and Retention—National Defence," 16.

¹⁰⁸ Huddleston, "Canadian Armed Forces Retention," 38.

There are as many possible subgroups as there are individuals. However, to be useful, those must be analyzed to uncover trends in reasons why certain groups are subject to unhealthy attrition. From this analysis, a strategy is developed to mitigate the problem areas, but those need to be done dynamically. Problem trends evolve over time; old ones transform, and new ones emerge. This creates a large quantity of information to actively manage but more information is required to better understand each subgroup and address an appropriate answer to unhealthy attrition. Because of this, data analytics is required to enable decision makers to elaborate an effective strategy.

Finally, highlighting elevated attrition and considerable retention issues in different subgroups of the military clearly demonstrates that a retention problem lies within the CAF. Furthermore, that problem is not limited to subgroups. As the nature of the military is that it requires specific capabilities for its combat effectiveness, attrition on those critical capabilities affect the CAF's overall operational effectiveness.¹⁰⁹ Once problematic subgroups are identified, it is of great importance to understand the cause and what portion of the decision process was the most influential in provoking elevated unhealthy attrition. Because pressures vary by subgroups, retention goals and targets for each of those must be unique to them.¹¹⁰ Unfortunately, so far, the studies do not break down the number in further details zooming in on years served or time remaining, for example.¹¹¹ Better clarified and precise data could improve the analysis of each subgroups' dissatisfaction in more detail and may provide clues towards mitigation.

¹⁰⁹ Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 2.

¹¹⁰ Chief of Military Personnel Strategy, Plans, and Policy, 11.

¹¹¹ Huddleston, "Canadian Armed Forces Retention," 45.

This chapter has demonstrated that the CAF has a relatively low general attrition level in comparison to Canadian standards, other countries, and global industries. However, it has also been shown that a seemingly normal rate hides some problematic areas. Firstly, it is difficult to precisely determine, without a doubt, the amount of resources required for the military. As such, the amount is decided upon between government and military and applies the principles of efficiency. This establishes the allowed amount of personnel at either just enough to accomplish assigned tasks, or, more realistically, below. Considering that the trained effective strength of the CAF is already lower than the preferred manning level, combining this with a closed labour market amounts to a CAF lacking resources for what it needs to do. Additionally, akin to an insurance policy, the CAF must remain ready to face unforeseen events. The notable increase of domestic operations speaks to this fact. Accordingly, additional tasks are piled on to an already unmanageable pile, and so, increases the risk of an existential threat. All of this, puts the CAF in a situation where any attrition whatsoever, has a detrimental effect that needs to be addressed. Thus, confirming the CAF does have an attrition problem.

Equally, further focus was given to how voluntary decisions to release come to be in an attempt to better define unhealthy attrition. It was noticed that personal hesitating between staying or leaving may be influenced by their view of the culture, policy and action of the CAF. Accordingly, it was recognized that the CAF environment present sources of dissatisfaction to its members in the three main categories of posting, workload, and leadership. These directly contribute to the CAF's unhealthy attrition and further confirm the presence of a problem. Finally, the average CAF attrition level was further segmented which permitted to discover that subgroups with the highest attrition was in fact problematic. They compose critical capabilities of the CAF, but their workforce attribution level is alarmingly low and their attrition level is

high. They pose a complex problem as each group sources its attrition from different reasons, and so, requires an adapted solution.

CHAPTER II - WHY IT LASTS SO LONG

This chapter aims to understand why the retention problem is taking so much time to solve. The identification of the problem was established at least as far back as 2002 in the first Auditor General report and was discussed by the Auditor General twice more in 2006 and 2016. Many CAF leaders have identified retention as a critical issue and efforts were allocated to solve it within SSE saying that “it is imperative that we protect our investment in the expertise and knowledge of our people” and looks to establish, “a number of initiatives designed to help the Canadian Armed Forces retain the talented people it recruits.”¹¹² It is intriguing to see that the situation as not significantly evolved. Chapter one has identified that although the CAF had some of the best attrition levels globally, retention was still a major issue because of many problematic details surrounding the problem. This two-edged definition of the problem, that is, that it can be considered relatively good globally, but simultaneously bad under specific characteristics, gives clues on the depth of the complexity of the issue.

Rittel and Webber’s Wicked Problems

A compelling explanation to the everlasting retention problem has recently been suggested by Amanda Huddleston and links this issue to the concept of wicked problems.¹¹³ This concept emerged in a 1973 paper by Rittel and Webber, and although fairly old, remains highly cited in policy science to this date.¹¹⁴ The issue emerges when social science uses principles of applied science to attempt to solve problems. Complications arise particularly because there is a

¹¹² Canada and Department of National Defence, *Strong Secure Engaged*, 21.

¹¹³ Huddleston, “Canadian Armed Forces Retention.”

¹¹⁴ Huddleston, 13.

marked difference between societal problems being solved by planners and those solved by scientists or engineers. In fact, where applied science problems are clear in definition and equally clear in results to say if the problem is solved or not, societal problems are not.¹¹⁵ Indeed, policy problems are rather ill-defined and subject to political judgment.¹¹⁶ Without going too far into the analysis right away, it is already possible to notice how the retention problem may fit the wicked one from the opening statement of this chapter. Indeed, depending on judgment and perspective, CAF retention may simultaneously appear to be in good and bad posture. Wicked problems do not possess clear traits. In contrast, they are more probably linked with larger if not all other policy issues. Akin to complex networks, the source of a problem on one node may provoke waves of repercussion on another. Thus, properly defining and locating the problem becomes impossible. In turn, designing an action plan to close the gap between the desired and the end state becomes equally impossible.¹¹⁷

The natural conclusion to this is that wicked problems are unsolvable. Instead, they must be actively managed or in a sense, perpetually resolved over and over again.¹¹⁸ However, the CAF possesses a very problem solving oriented culture which may inhibit the realization of this situation. Linking the definition of wicked problems to the retention issue of the CAF would provide a logical explanation to why this issue remained a problem to be solved for so long. To do so, the following sections will dig deeper into the ten characteristics defining wicked problems and attempt to relate them to the retention issue of the CAF.

¹¹⁵ Horst W. J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning" (Springer Source: Policy Sciences, Vol. 4, No. 2 (Jun., 1973), pp. 155-169, 1973), 160, <http://www.jstor.org/stable/4531523>.

¹¹⁶ Rittel and Webber, 160.

¹¹⁷ Rittel and Webber, 159.

¹¹⁸ Rittel and Webber, 160.

First Characteristic

The first characteristic relates to establishing a definitive formulation of a wicked problem. The formulation of a tame problem implies the enumeration of all its components giving the problem solver all the information needed to understand and solve the problem.¹¹⁹ The enumerated list is logical and cannot be argued with. In contrast, it is not possible to define wicked problems in the same way. As Rittel and Webber explain, all the information needed to address a wicked problem is dependent on an idea for solving it. This implies that the description of a wicked problem lists all the conceivable solutions.¹²⁰ Therefore, the formulation of a wicked problem is intertwined and simultaneous to the development of possible solutions. A problem arises from the many different perspectives of stakeholders on an issue. Their views and opinions on the problem may differ causing many different formulations and possible solutions to the problem.¹²¹

In the case of the CAF's situation, innumerable number of stakeholders are touched by the attrition issue. The many differences in sources of dissatisfactions are indicative of this. As is the fact that many stake holders are also external to the CAF, on the political side, and holding decision power and resources. As such, one can easily see how the different perspectives may distort the problem statement and solution set. An external actor may view the problem as solved from the low relative attrition rate. In contrast, an internal actor may judge the problem unresolved based on his overwhelming workload. The only possible way to reach the possibility of a definitive solution would require the inclusion of all possible formulations of the problem.

¹¹⁹ Rittel and Webber, 161.

¹²⁰ Rittel and Webber, 161.

¹²¹ Huddleston, "Canadian Armed Forces Retention," 11.

Given the complexity of this task, it is simply unrealistic.¹²² The author of this paper has done a humble effort to compile an exhaustive formulation of the issue in chapter one. From those, it is possible to notice that each portion of the description is also a possible solution. Each part of the argument presents a source of the problem that, if reduced, would mitigate the problem. Thus, providing evidence in support of the first characteristic.

Second Characteristic

The second characteristic relates to the fact that wicked problems lack a stopping rule. In a tame problem, there is a point at which a solution has been achieved and that point is evident i.e., an end. Finding the result of a mathematical equation, for example, is finite. Once it is achieved, no amount of extra effort will modify or improve the solution. In the case of a wicked problem, however, because the solution is linked to the definition, and the definition may have an infinity of variation and precision, a slightly better solution is always possible.¹²³ As such, there is no stopping rule. A solution effort only stops as resources to be allocated to it are depleted.

The lack of a stopping rule is also noticeable in the CAF's context in at least two evident ways. First, looking at subgroups of the CAF's population allow one to tailor a solution to that group's specific sources of dissatisfaction. However, subgroups can always increase in precision or, at least up until the individual level has been reached. That means that a better, individually moulded attrition strategy could always be created. Secondly, the unpredictable nature of the work environment of the CAF and its requirement to be the country's insurance policy against threats makes it very difficult to precisely determine the required number of personnel needed.

¹²² Huddleston, 92.

¹²³ Rittel and Webber, "Dilemmas in a General Theory of Planning," 162.

Even if such a number were identifiable, threats evolve with time, as will those requirements. This provides infinite opportunities to improve a retention strategy. This underlines why this issue lasts so long and also confirms compliance to the second characteristic.

Third Characteristic

The third characteristic relates to the characterization of wicked problem as good-or-bad. In contrast, tame problems can be independently verified as true-or-false. For example, independent experiments can constantly confirm Newton's universal law of gravitation as true. However, this is not the case for wicked problems. Again, because of differences amongst parties' judgments, assessments will widely vary.¹²⁴ Therefore, the impact of an attempted solution would rather be gauged in good-or-bad, or better-or-worse.

Huddleston suggests a fitting example of this in the implementation of Military Family Resource Centers (MFRC). She states that, although their appearance made a positive impact, CAF members still cited concerns for their family as a high source of dissatisfaction and a reason to leave the organization.¹²⁵ This situation emphasizes that support for families was not the sole source of dissatisfaction. In fact, postings seem to rank highest in this field. As such, it was impossible to have a right-or-wrong solution. In this case, it would be best seen as an improvement. Thus, confirming the compliance to the third characteristic

¹²⁴ Rittel and Webber, 163.

¹²⁵ Huddleston, "Canadian Armed Forces Retention," 93.

Fourth Characteristic

The fourth characteristic relates to the impossibility to test possible solutions to wicked problems. Rittel and Webber explain this concept through the waves of uncontrollable consequences generated from the implementation of a potential solution.¹²⁶ These involuntary repercussions extend for an unlimited amount of time.

An example of this is present in the repercussion on current command appointments that were caused by the force reduction program of the 1990s. The program reduced extensively a generation of members that would be filling those positions now.¹²⁷ The Auditor General highlights the challenge present in trying to assess the impact of changes in military human resources policy.¹²⁸ But, wicked problems assert that, even in this case, no tests could have predicted the extent of this impact. This again confirms the compliance of the CAF's attrition problem to the wicked problem model. Additionally, it partly explains why this issue is everlasting. Long-lasting undesired repercussions will definitely further complexify the issue and require more time to fix.

Fifth Characteristic

The fifth characteristic underlines that wicked problems do not allow trial and error learning. This is due to the fact that every implemented solutions provoke irreversible consequences.¹²⁹ Testing a possible solution in the case of the attrition issue in the CAF would undeniably affect the members on which the test is conducted along with their family and would

¹²⁶ Rittel and Webber, "Dilemmas in a General Theory of Planning," 163.

¹²⁷ Huddleston, "Canadian Armed Forces Retention," 94.

¹²⁸ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 26.

¹²⁹ Rittel and Webber, "Dilemmas in a General Theory of Planning," 163.

necessitate many unrecoverable resources. Subsequently, the problem set and situation as a whole will have been changed by the test. Notwithstanding the invention of time travel, no other action would allow the situation to revert back to what it was before the test. Therefore, this supports the alignment of the CAF's problem and those of the wicked type.

An interesting possibility lies in studying the results of other organizations implementing solutions to similar problems. In lieu of experimenting, this method can provide insights into possibilities. However, as it will be seen in the seventh criteria, it will never be possible to perfectly integrate an external solution because of the uniqueness of each problem. Another alternative is to improve information management on the subject and use big data type analyses to provide further detail in the problem definition and augment chances of improving the situation. Since the first Auditor General report, information on attrition has been gathered but has not been used to develop solutions, which has resulted in an opportunity lost.¹³⁰

Sixth Characteristic

The sixth characteristic relates to the number of possible solutions to a given problem. In the case of a tame problem, a finite number of rules are applied which permits one to consider all possible options. Rittel and Webber state chess as an example in which all situations that can occur can be accounted for.¹³¹ This has been demonstrated by the ability of Deep Blue and Alpha Go computers to win the game. Wicked problems are less subject to such boundaries. Rather, it is more probable that imagination and judgment restrict potential solutions given that

¹³⁰ Canada, Government of Canada, "Report 5—Canadian Armed Forces Recruitment and Retention—National Defence," 20.

¹³¹ Rittel and Webber, "Dilemmas in a General Theory of Planning," 164.

some have been considered, and others may not have been thought of or may have been discarded.

The innumerable possible solutions to wicked problems are based in its ill definition and its networked typed cause and effect property. To be able to address an exhaustive list of options for retention, the CAF would need to consider all aspects of the problem along with their associated solution, all repercussions of those possible actions, and all of this in the context of each member and stakeholders' specific preferences. Hence, this is inconceivable. However, the better one is able to define these properties and interactions, the better the chance that the designed solution would improve the situation. With the assistance of data analytics and computer-enhanced decision-making, a larger set of parameters can be considered. Thus, such techniques may be beneficial the CAF's retention management system.

Seventh Characteristic

The seventh characteristic pertains to the fact that wicked problems are essentially unique. This underlines that there is always at least one difference in each wicked problem. In contrast, tame natural science problems such as those of thermodynamics, all share certain characteristics that make it possible to transfer one solution from one problem to another. As such, it is possible for laws of thermodynamics to be created. This is not possible in wicked problems. Rittel and Webber's definition underline that "despite long lists of similarities between a current problem and a previous one, there always might be an additional distinguishing property that is of overriding importance."¹³²

¹³² Rittel and Webber, 164.

The discussion on the different sources of dissatisfaction causing unhealthy attrition in the CAF's subgroups already confirms this phenomenon. Although they all share the general retention problem, key differences mandate adaptations in solutions. A pilot may retire because he or she progressed out of a flying job whereas a person in a service couple situation might retire to prioritize the service of their partner. Therefore, no universal law can be applied.

Eight Characteristic

The eighth characteristic relates to the lack of a natural level in wicked problems. As such, any problem can be considered as the symptom of a larger problem.¹³³ A key point to note here is that trying to solve a problem on to low of a level might worsen the problem. Therefore, although it is easier for someone to focus on the problem on their level and lower, it is important to make an effort to address the larger underlying problem.

Many deductions can be made from the application of this characteristic to the CAF's problem. Firstly, when analyzing this problem from within the CAF, it is important to prioritize efforts on force-wide issues as close to the source as possible before smaller subsections. This suggests that general sources of dissatisfaction should have precedence over smaller subsections. In a sense, it is better to address dissatisfaction with postings in general rather than the dissatisfaction with one specific location. This goes against human nature as the larger problems are harder to improve than the smaller symptoms.

Secondly, to improve the CAF's ability of attacking those higher-level problems, the reinforcement of a central authority team that can provide vision and alignment may be needed

¹³³ Rittel and Webber, 165.

as was mentioned by the Auditor General. It was noticed that the Army, Navy, Air Force amongst other stakeholders considered the Assistant Deputy Minister-Military Human Resources as an advisor only. As such, this prevented the unification of effort, and creating inconsistent and fragmented policies and practices in the CAF human-resource management system.¹³⁴ Unity of effort is required to tackle the problem at or close to the source. Until, it can be better achieved, improvements will be marginal.

Lastly, problems at the level of the CAF may also only be a symptom of higher larger problems. Attrition from the point of view of overwhelming work is only partly manageable at the CAF level. As the nations' insurance policy, when disaster strikes or at any time the governments deem actions necessary, the CAF will have to respond. Thus, many sources of this problem lie outside of the CAF's power. When attempting to influence at higher levels, the CAF may be faced with overwhelming bureaucratic red tape¹³⁵ or even uncontrollable natural events. Consequently, resolution is impossible, only better management can be envisioned.

Ninth Characteristic

The ninth characteristic relates to differences in the explanation of the problem from person to person. Because there are many ways to describe a wicked problem, a person has to choose a certain a way. Furthermore, since the description and possible solutions to a wicked problem are indiscriminately linked, the choice of the description is ultimately a determinant of the solution efforts. Finally, because of the uniqueness of each problem and the impossibility to

¹³⁴ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 24–25.

¹³⁵ Canada, Senate Committee on National Security and Defence, "Wounded: Canada's Military and the Legacy of Neglect Our Disappearing Options for Defending the Nation Abroad and at Home," 84.

test solutions, the efficiency of a given solution cannot be determined before implementation. Consequently, everything revolves around the judgment of the problem solver.

This characteristic is further exacerbated by the rapid turnaround nature of the forces.¹³⁶ New personnel with decision powers are assigned in key authority positions about every two years. Because each of those decision makers will have a different view of the problem, their description of it and solutions will vary. This will result in an inconsistency of policy over time, which will impede the progression of improvements on the issue.

Tenth Characteristic

The last characteristic implies that the planner has no right to be wrong. Because the goal is not to discover the truth, but rather to improve the lives of people, planners are held accountable for the effects and consequences of the policy they implement.¹³⁷ The effects created by the possible solution have an impact on the people targeted by the solution actions. Accordingly, those possible solutions are of great importance to those people precisely because of the change it causes to their lives. Hence, those people hold their leaders responsible of the impact their lives sustained as the result of the leader's decisions, particularly if the effects were negative.

Huddleston sheds light on a perverse effect this characteristic has in the context of the military. The CAF functions under a hierarchical system which promotes on merit based on the results of the accomplishments of a person. Of course, any bad repercussions caused by the

¹³⁶ Huddleston, "Canadian Armed Forces Retention," 99.

¹³⁷ Rittel and Webber, "Dilemmas in a General Theory of Planning," 167.r

initiatives of a person will hinder his eligibility for promotion. The tenth characteristic of wicked problems underlines the accountability link a decision maker has with the results of the implemented policy. However, because of the uniqueness and untestability of wicked problems, it is impossible to determine with certitude that the consequences of a given strategy will be beneficial. As such, a risk is posed to decision makers' career on each of the policy decisions taken. Action may be discouraged as a result of fear of losing advancement opportunities.¹³⁸ In turn, such a lack of action will perpetuate the problem in time.

In summary, the CAF's retention problem fits the definition of a wicked problem. Consequently, the organization must come to terms with the fact that it is not an issue that it will be able to resolve once and for all. It is, in fact, because of the unsolvable nature of the problem that it has and continues to exist for so long. However, the knowledge of this does allow for improvements. The nature of wicked problems is such that there is always a path for improvements. Nevertheless, to achieve improvements, the issue must be constantly managed as it can too easily evolve in the wrong direction.

This poses a challenge to the CAF as definitive problem solving is deeply ingrained in its culture. Battles are won or lost, not so much in a perpetual state of management where the problem needs to be resolved constantly through time.¹³⁹ Thus, the wickedness of the retention problem is difficult for the CAF to accept. However, this analysis suggests that the only possible

¹³⁸ Huddleston, "Canadian Armed Forces Retention," 100.

¹³⁹ Rittel and Webber, "Dilemmas in a General Theory of Planning," 160.

way for the CAF to mitigate the retention issues is to actively manage it to the best of its abilities and create the best possible policy for its members.¹⁴⁰

¹⁴⁰ Huddleston. "Canadian Armed Forces Retention." 100.

CHAPTER III - WHAT CAN BE DONE

Coming to the realization that the CAF's retention problem is one of the wicked kinds may be discouraging. The unsolvable nature of the problem makes the promise of a successful result seem unattainable. However, it is possible to improve them. As such, instead of thriving for a goal of a definitive answer, it is better to reframe this goal into one of constant improvement. Although complex and difficult, the wicked nature of the retention problem makes constant improvements possible. When linked to the impact that this issue has on the CAF's members and their families, the noble objective of improving its members' lives arises. In this sense, although complex and difficult, possible solutions and action plans can be devised, some of which will be presented in this chapter.

Constant Management

The retention landscape evolves constantly. If one were to take a snapshot of the retention situation at different intervals, a retention survey for example, one would see differences and evolution. This is related to the changing nature of the possible causes of attrition. The present lack of talented workers can be attributed to the exit of baby boomers and gen X, which is associated to this moment. Such a problem was not present while they were employed. Similarly, the issues affecting a particular member will also evolve over time causing differences in the main sources of dissatisfaction. Therefore, this underlines the dynamic nature of the retention problem. Furthermore, depending on the particular perspective of each stakeholder, the retention

issue can be defined in different ways which imply different solutions.¹⁴¹ From this, it is also possible to see the dynamism of the situation as decision makers changes over time. Equally important are the consequences of the decisions made to address retention. Since the results are irreversible and unpredictable, the retention landscape is bound to change in unanticipated ways. Again, the unsolvability in a definitive manner is underlined and seems to imply the need for an active and constant management.

No significant improvement to the CAF's attrition problem is possible without the presence of personnel actively managing it. Currently, such a management team, with the power to direct and ensure accountability of actions does not exist.¹⁴² Therefore, the first recommendation is the creation of a managing body having the responsibility and resources to improve the retention situation. The analysts of the office of the Director Personnel Strategy, Chief of Military Personnel has also come to this conclusion. The upcoming strategy will establish two management bodies; an assessment and advisory group as well as a governing body.¹⁴³ As such, efforts will be allocated to the analysis of the dynamic retention landscape and will be able to provide adapted and timely possible means of improvements. Furthermore, an additional group will be allocated the power to coordinate actions. Hence, the CAF will be able to address the problem as close to the source as they can. Thus, preventing siloed efforts as recommended by the Auditor General.¹⁴⁴ Finally, many external actors that play a role on provoking the CAF's attrition problem will remain outside of the CAF's authority. However, the management body actively overseeing the retention issue will be better placed to influence them.

¹⁴¹ Rittel and Webber, "Dilemmas in a General Theory of Planning."

¹⁴² Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 16.

¹⁴³ Chief of Military Personnel Strategy, Plans, and Policy, 16.

¹⁴⁴ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 24.

Therefore, they may be able to provide more convincing arguments to government authorities to augment resource allocation or to diminish tasks. Both of which would diminish the severity of the situation.

Member Decision and EVP

The choice to leave the CAF is always present for a member and comes back to mind easily when this member faces frustrations. At those times, the grass always seems a little greener on the other side of the fence. This might be in part because of the alluring offers from competing employers trying to lure employees their way. In a time of employee shortages, all employers' double efforts to attract the best talent. Greater salary is often what retains the attention of CAF members since the cost of living is increasing, and the military cannot match those offers because of public sector restrictions.¹⁴⁵ When the member experiences a source of dissatisfaction, the appeal of extra pay of competitors comes back to mind in a manifestation of the availability heuristic. Therefore, at times, this may sway the member into switching employer.

Although external employment offers are outside of the CAF's control, it is possible to fight back with the use of a clear Employer Value Proposition (EVP). Developing an EVP would communicate why a talented employee should choose the CAF as an employer.¹⁴⁶ Of course, this is useful in recruitment efforts, but also communicates the EVP to existing employees making

¹⁴⁵ Express Employment Professionals, "New Survey: Employee Turnover On The Rise," GlobeNewswire News Room, October 4, 2019, 3, <http://www.globenewswire.com/news-release/2019/04/10/1802025/0/en/New-Survey-Employee-Turnover-On-The-Rise.html>; Edgar et al., *Strengthening the Canadian Armed Forces through Diversity and Inclusion*, 9.

¹⁴⁶ Cocolakis-Wormstall, "Labour Shortage: Here to Stay," 14.

their own current workplace more attractive.¹⁴⁷ In clear comparison of EVPs, higher wages offered by competitors will fair less compared to the social advantages of the CAF. Additionally, loss aversion, the effect that makes us value losses twice more than an equivalent win, would play in favour of the CAF.¹⁴⁸ Finally, improved communication through a clear and often communicated EVP will have a positive impact on the impression of higher-level leadership and may improve retention.¹⁴⁹

The CAF realizes it is in clear need of an EVP, it is mentioned in SSE that “the current system is too slow to compete in Canada's highly competitive labour market and does not effectively communicate the exciting and fulfilling employment opportunities offered by military service.”¹⁵⁰ Luckily, the CAF’s strategic analysts are developing an EVP communication plan that will be frequent, direct and transparent as part of the retention strategy.¹⁵¹

External influences are one of the three major influencers seen in chapter one, acting upon a member’s decision; the two others being personal values and what the CAF has to offer. Considered within the CAF’s EVP are the sources of dissatisfactions. These can be separated into two main types, CAF-wide sources of dissatisfaction, and subgroup specific sources of dissatisfaction. Each of them can be addressed in order to mitigate attrition.

¹⁴⁷ Cocolakis-Wormstall, 4–14.

¹⁴⁸ Daniel Kahneman, *Thinking, Fast and Slow*, 1st edition (New York: Farrar, Straus and Giroux, 2013).

¹⁴⁹ Huddleston, “Canadian Armed Forces Retention,” 111; Edgar et al., *Strengthening the Canadian Armed Forces through Diversity and Inclusion*, 16.

¹⁵⁰ Canada and Department of National Defence, *Strong Secure Engaged*, 20.

¹⁵¹ Chief of Military Personnel Strategy, Plans, and Policy, “CAF Retention Strategy (DRAFT),” 12-15–19.

Postings

In the general sources of dissatisfaction subsection of chapter one, CAF-wide sources of dissatisfaction were identified and regrouped in categories in Table 1.1. In doing so, it was possible to see the disproportionate importance postings have as the majority of sources of dissatisfaction were largely related to it. As such, the CAF's posting policy will have an equally disproportionately large impact on retention. And because no significant changes have been made to it in the past decades, it would be appropriate to suggest a way to improve it.¹⁵² Alvin E. Roth's theories on market matching may suggest an alternative in which both the institution and the member couldn't be more satisfied of the outcome of a posting season.¹⁵³ This equilibrium would be reached through a mathematical algorithm which may add some stability to the wickedness of the issue.

The National Resident Matching Program (NRMP) is a computer algorithm that matches medical applicants of residency programs to hospitals in a way that reaches stable matching.¹⁵⁴ As such, it results in an equilibrium, or a "truth" that wicked problems can only dream of. To bring better precision, it can be defined as such "that no applicant and hospital who were not matched to one another would both prefer to be matched to the other than to their proposed match, and thus form a "blocking pair.""¹⁵⁵ It functions in three distinct steps. The first step is comprised of an exchange of information between applicants and hospitals in the form of an interview. This

¹⁵² Chief of Military Personnel Strategy, Plans, and Policy, 4.

¹⁵³ Alvin E. Roth, *Who Gets What — and Why: The New Economics of Matchmaking and Market Design*, Reprint edition (Boston: Eamon Dolan/Mariner Books, 2016).

¹⁵⁴ Alvin E. Roth, "The Evolution of the Labor Market for Medical Interns and Residents: A Case Study in Game Theory," *Journal of Political Economy* 92, no. 6 (December 1984): 991, <https://doi.org/10.1086/261272>.

¹⁵⁵ Alvin E. Roth, "Marketplaces, Markets, and Market Design," *The American Economic Review* 108, no. 7 (July 2018): 1623, <http://dx.doi.org.cfc.idm.oclc.org/10.1257/aer.108.7.1609>.

provides knowledge for all parties to list their preferences. The second step is the confirmation of the preference ranking and its submission into the computer. Finally, the third step is the algorithm matching starting by applicant preference until blocking pairs are maximized and the optimum solution is reached. Such stable matching is of great importance for the long-term success of the system. This is particularly true because actors have a large set of possibilities outside the marketplace.¹⁵⁶ When matching is unstable, there is at least one possible blocking pair “not matched to one another who would both prefer to be,” and those will bypass the market to match themselves together.¹⁵⁷ Thus, instability in the system can break it and drive-up turnover.

It would be possible to apply an adapted version of the NRMP algorithm to the CAF’s posting situation. Both situations are similar in the way they allocate personnel to job offerings based on preference. The information exchanged in the interview phase might change but will none the less enable both sides to determine their ranking preference. In this case, applicants might focus their choices on geography and the associated family impact, job description, and career advancement opportunities; all in alignment with sources of dissatisfactions. In turn, the institution might focus on qualifications, experience, past performance, and potential. Once rankings are established, the algorithm could be actioned as intended to reach equilibrium. There is one particularity to the CAF’s situation, and it is that service needs must be prioritized due to the nature of the CAF’s tasks. Accordingly, not all job offerings are equal, and some priority tasks must be filled.¹⁵⁸ Therefore, a supplemental step can be added at the end of the NRMP

¹⁵⁶ Roth, 1623.

¹⁵⁷ Roth, 1623.

¹⁵⁸ Chief of Military Personnel Strategy, Plans, and Policy, “CAF Retention Strategy (DRAFT),” 13.

algorithm. Once the program has reached equilibrium in normal order, if priority tasks are not filled, it could come back in opposite order and fill those with the last qualified blocking pairs created. Hence, reaching a new equilibrium. Having the required qualification here is important to be effective in the job but also to prevent preferential selection outside of the system from a powerful commander, thus breaking equilibrium. Ensuring qualification for the job ensures that standard is met giving no reason to bypass the system.

Of course, using this technique would not procure an absolute solution. As it has been demonstrated, such a “truth” is not possible in wicked problems. Even in an equilibrium setting, the stressors experienced may still push a member towards releasing. The presence of overloading workloads will remain present, for example. There is also the chance that a party remains unselected by all the others at the end of the process. Given the workforce shortage, this phenomenon is more applicable to posting choices. In this instance, it might be valuable to look at why this given posting option is unappealing and mitigating it directly.

However, it would provide some improvements. Even if it is not perfect, the equilibrium setting would still offer the most satisfying posting offer available for all parties. Given their choice, members can adapt their ranking to their preferences and mitigate the sources of dissatisfaction. Geography concerns along with its family implication, and job satisfaction issues will, thus be mitigated. Career management and transparency concerns should be reduced as well. Military promotions are mostly based on key positions members have held in the past.¹⁵⁹ The fact that such appointments are allocated by higher commander makes the promotion system

¹⁵⁹ Ashley Burke, “Commander of Special Forces to Be Replaced Early after Apologizing for Handling of Sexual Assault Case | CBC News,” CBC, April 30, 2021, <https://www.cbc.ca/news/politics/commander-special-forces-peter-dawe-apologizes-open-letter-1.6008705>.

completely biased. The use of a computer algorithm to attribute postings mainly based on preference would restore confidence that members' choice is respected and may improve perception of fairness. Finally, the presence of the member's choice in this procedure should allocate him/her greater flexibility in designing a career path fitting his/her desires. Therefore, the use of an algorithm similar to NRMP should improve retention in the CAF.

Data Analysis and Subsegments

While analyzing the sources of dissatisfaction of subgroups, one quickly notices that each subgroup can further be subdivided into smaller ensembles. In turn, those smaller more closely linked in similarities groups provides better and more precise information on their dissatisfactions. This subdivision can go down to the individual level, and, combined with an unbound range of sources of dissatisfaction, can present an infinity of possible individual solutions. As predicted by wicked problem theory, this develops into an infinity of possible improvements. Analyzing this level of detail provides an opportunity to address SSE's goal of providing a personalized touch to its administrative and leadership approach.¹⁶⁰ A concentrated analysis of the details pertaining to each group is thus required.¹⁶¹

The CAF already has access to a plethora of data. However, it requires greater desegregation and precision as, for example, minorities are not isolated into subgroups.¹⁶² Therefore, the first recommendation here would be to increase the level of detail of the data

¹⁶⁰ Canada and Department of National Defence, *Strong Secure Engaged*, 22.

¹⁶¹ Canada, Government of Canada, "Chapter 2—National Defence—Military Recruiting and Retention," 27; Cocolakis-Wormstall, "Labour Shortage: Here to Stay," 14.

¹⁶² Chief of Military Personnel Strategy, Plans, and Policy, "CAF Retention Strategy (DRAFT)," 10.

gathered and to combine it into a database to allow for the conduct of analytics, which entails the “computational transformation of data into insights.”¹⁶³

The second recommendation would be to allow for data democratization within the organization, where “everybody has access to data and there are no gatekeepers that create a bottleneck at the gateway to the data.”¹⁶⁴ This will improve agility and allow leaders at all levels to better understand the issue and apply mitigation at their level. However, the principal advantage will be gained from the principle of design thinking. Allowing access to the information at all levels of the organization enables decentralized creativity and innovation. In turn, this sets the conditions for use of the iterative cycle of human-centred design. This cycle is characterized by the steps of observation, idea generation, prototyping and testing and based on the double-diamond model of design (Figure 3.1).¹⁶⁵ Because more leaders will be conducting analysis on sources of dissatisfaction they will, not only, be more involved, but there will be a larger divergence in thinking thus increasing the chances of finding an effective attrition mitigation improvement.

¹⁶³ Data National Defence Innovation, Analytics, “ANALYTICS IN DND/CAF Vision and Guiding Principles” (ADM DIA, July 2020), IV.

¹⁶⁴ Bernard Marr, “What Is Data Democratization? A Super Simple Explanation And The Key Pros And Cons,” Forbes, accessed February 7, 2021, <https://www.forbes.com/sites/bernardmarr/2017/07/24/what-is-data-democratization-a-super-simple-explanation-and-the-key-pros-and-cons/>.

¹⁶⁵ “The Design of Everyday Things: Revised and Expanded Edition: Amazon.ca: Norman, Don: Books,” 221, accessed February 7, 2021, https://www.amazon.ca/Design-Everyday-Things-Revised-Expanded/dp/0465050654/ref=sr_1_1?crd=O6FQQHUTFCOL&dchild=1&keywords=the+design+of+everyday+things&qid=1612753772&s=books&prefix=the+design+of+c%2Cstripbooks%2C157&sr=1-1.

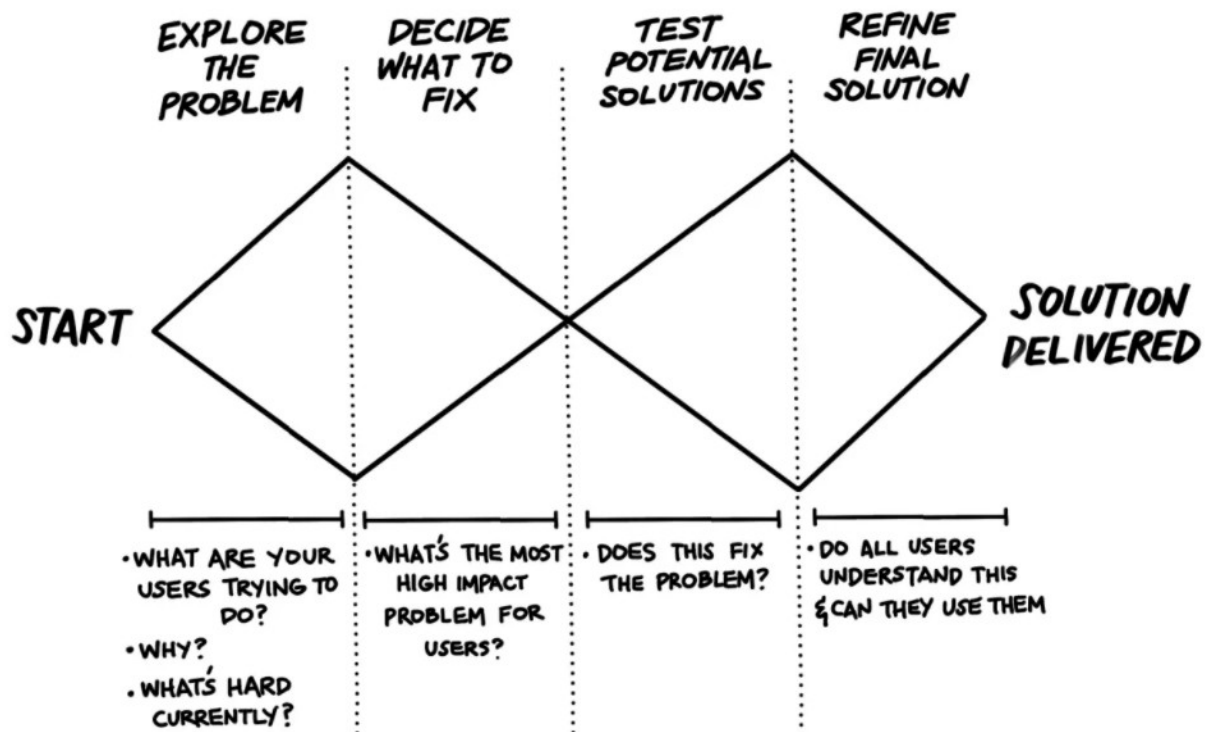


Figure 3.1. The double-diamond model of design¹⁶⁶

Minorities

Additionally, the improvement in the quality and quantity of insights possible will augment the chances of addressing segments that have great potential in diminishing the attrition issue. Immigrant workers, Indigenous people, disabled people and retired workers, for example, are subgroups that are underused in the Canadian labour force.¹⁶⁷ However, in the case of immigrant workers in particular, much of Canada’s entire labour force growth is a function of immigration.¹⁶⁸ As such, an increasing proportion of the recruited force will necessarily be

¹⁶⁶ “How To Run The Right Kind Of Research Study With The Double-Diamond Model,” Smashing Magazine, <https://www.smashingmagazine.com/2020/05/research-study-double-diamond-model/>.

¹⁶⁷ Cocolakis-Wormstall, “Labour Shortage: Here to Stay,” 16.

¹⁶⁸ Edgar et al., *Strengthening the Canadian Armed Forces through Diversity and Inclusion*, 15.

constituted of minorities. Taking better care of CAF minorities with specifically adapted retention conditions will increasingly positively impact the force it can retain. This represents a tremendous opportunity to grow the minorities segment in the CAF as it constitutes only a very small proportion of its total workforce; much lower than the minority proportion in the Canadian total workforce.¹⁶⁹ Strong retention policies will be required to grow this segment. Much room for improvement is available as the underrepresentation of minorities in the CAF may be related to many distinct factors. These include certain cultures' low view of military careers, the insufficient visible minority representation in the CAF higher ranks, the importance of education, and many more.¹⁷⁰ Furthermore, at this time data gathered in the CAF for the retention issue doesn't dig down enough to separate and identify the specific sources of dissatisfaction of minority cultures. Thus, an improvement of data analytics applied to the minority context is necessary for the CAF to be able to take advantage of this growing sector.

Talent Mobility

Employee preferences change and sources of dissatisfaction evolve over time, which creates forces for change and a dynamic work environment. Those influences may push a member's decision towards early retirement as new interests may drive him/her in another career path. Faced with the possibility of losing a member, an organization is far better off to accommodate a change in occupation from within taking advantage of available opportunities across the enterprise.¹⁷¹ In fact, this changing environment forces the CAF to adopt a paradigm shift towards mutual accommodation.¹⁷² Furthermore, not only can talent mobility improve

¹⁶⁹ Park, "A Profile of the Canadian Forces," 18.

¹⁷⁰ Park, 19.

¹⁷¹ Deloitte Insights, "Leading the Social Enterprise: Reinvent with a Human Focus.," 185.

¹⁷² Edgar et al., *Strengthening the Canadian Armed Forces through Diversity and Inclusion*, 2.

retention, but it may also beneficially impact growth, employee engagement, and business performance.¹⁷³ A modest improvement to talent mobility may be achieved through the application of a variation of the NRMP algorithm. Since this method allows for more choice in posting assignment, members are in better control of their career. However, this is only from within occupations, larger flexibility is required. This is difficult to achieve mainly because of the barriers to change that exist with the CAF's rigid career paths. Thus, to attack this problem a focus must be allocated to those barriers. Here again, data analytics will enable to identify which barriers are more problematic and which have offered the best possible return. This way, efforts can be concentrated to tear down barriers one by one and incrementally improve retention.

In summary, the wickedness nature of the CAF's retention issue drives the need for repeated, over and over again, resolution without the possibility of a definitive answer. However, it also allows for the possibility of endless improvements. Because of this, an active and constant management cell is required to guide and align retention efforts. Member preferences and the unpredictability of the consequences of solution attempts drive the need for constant realignment. Without a strategic management cell, it would be impossible to ensure changes are made in the right direction and improvements are achieved. Thus, this is therefore the most important change the CAF must apply. Furthermore, since unhealthy attrition appears mostly as a result of member decisions, the CAF must also ensure it communicates its EVP clearly and frequently to influence that decision. Additionally, to address particular dissatisfaction in subgroups, the use of data analytics is required. This is particularly true in order to better include the growing minority segment and offer better talent mobility. Finally, the use of NRMP offers a

¹⁷³ Deloitte Insights, "Leading the Social Enterprise: Reinvent with a Human Focus.," 198.

promising improvement of the posting situation as it enables members to better choose and control their career path.

CONCLUSION

This research aimed to confirm that, although the retention problem will remain and will affect populations larger than just the CAF, this paper argued that there are initiatives that can be implemented to improve the CAF's circumstances. Firstly, the confirmation of an attrition problem larger than the CAF was made through the numerical analysis of other countries and other industries. This analysis showed a generally high attrition level particularly in relation to the CAF, suggesting the presence of a larger issue. Furthermore, the implications of government and other external stakeholders in the allocation of resources and tasks to the CAF also emphasized that the nature of the issue was beyond the scope of the CAF. Secondly, it was determined that this issue would remain as it is essentially unsolvable from a definitive point of view. This was demonstrated by confirming that the CAF's attrition problem corresponded to the characteristics of a wicked problem, which are, by definition, unsolvable. Finally, from the characteristics of a wicked problem also come endless opportunities for improvement. Precisely because of the unlimited variability of the definition of the CAF's problem, an equally unlimited variety of solutions exists. Thus, proving the CAF can improve its circumstances.

To confirm the thesis, the question of why retention is considered such a big issue in the CAF was first answered. Through this, it was discovered that although having a comparatively low attrition rate, the CAF can't afford any unhealthy attrition due to its low workforce attribution level, high number of tasks, and the fact it cannot fail without placing the country under existential threat. Additionally, the importance of the problem was also confirmed in the

presence of considerable CAF-wide sources of dissatisfaction related primarily to postings. Likewise, it was also demonstrated that attrition levels varied amongst subgroups because of different sources of dissatisfaction. Some subgroups have alarmingly high attrition levels and compose key capabilities of the CAF, putting at risk the organizations' ability to complete its mission. Thus, further emphasizing the severity of the problem. Then, an explanation of length and unresolved nature of the effort through the lens of wicked problems. By confirming that the CAF's retention problem belongs to the wicked problem family, it was possible to understand that it is unsolvable. However, a beam of optimism was also discovered as it also confirmed the possibility to improve the situation endlessly. Finally, a humble variety of possible improvements were suggested further confirming that there are initiatives that can be implemented to improve the CAF's circumstances.

Based on these conclusions, it could be beneficial for the CAF to consider some of the recommendations made in this paper. The establishment of a retention management body is the most important. The nature of wicked problems requires strategy alignment as close to the source as possible. Without it, improvement cannot be more expected than with chance occurrence. Additionally, clear communication of the CAF's EVP is also essential in influencing member's decision. Equally important is the use of data analytics to better identify sources of dissatisfactions and gain better insight into possible solution. Accordingly, chances of success in providing talent mobility and retaining minorities would be improved. The CAF's draft of a retention strategy appeared to suggest that many of those would be considered in the upcoming plan. However, the one that may present additional benefits is the use of an adaptation of the NRMP algorithm to the allocation of postings.

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