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2020 Report on Suicide Mortality in the Canadian Armed Forces (1995 to 2019)

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2020 Report on Suicide Mortality in the Canadian Armed Forces (1995 to 2019)

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Abstract

Introduction: Each death from suicide is tragic. Suicide prevention is an important public health concern and is a top priority for the Canadian Armed Forces (CAF). In order to better understand suicide in the CAF and refine ongoing suicide prevention efforts, the Canadian Forces Health Services annually examine suicide rates and the relationship between suicide, deployment and other potential suicide risk factors. This analysis, conducted by the Directorate of Mental Health (DMH), is an update covering the period from 1995 to 2019.

Methods: This report describes crude suicide rates from 1995 to 2019, comparisons between the Canadian population and the CAF using Standardized Mortality Ratios (SMRs), and suicide rates by deployment history using SMRs and direct standardization. It also examines variation in suicide rate by environmental command, and uses data from Medical Professional Technical Suicide Reviews (MPTSR) to examine the prevalence of other suicide risk factors for suicide deaths that occurred in 2019.

Results: Between 1995 and 2019, there were no statistically significant increases in the overall suicide rates. The number of Regular Force males that died by suicide was not statistically higher than that expected based on male suicide rates in the Canadian General Population (CGP) for each time period that was evaluated.

Rate ratios comparing Regular Force males with a history of deployment to those without this history did not establish a statistically significant link between deployment and increased suicide risk. The most recent findings (2015 – 2019) suggest that the suicide rate in those with a history of deployment was slightly higher but not statistically different when compared to those with no history of deployment (age-standardized suicide rate ratio: 1.13 [95% CI: 0.59, 2.16]). This is concordant with the 10-year (2005 – 2014) pattern which indicated that those with a history of deployment were possibly at a higher risk of suicide than those with no such history (age-adjusted suicide rate ratio: 1.46 [95% CI: 0.98, 2.18]).

These rate ratios also highlighted that, since 2006 and up to and including 2019, being part of the Army command was associated with a higher risk of suicide relative to those who were part of the other environmental commands (age-standardized suicide rate ratio: 2.13 [95% CI: 1.62, 2.79]). The 3-year suicide rate moving average suggested that the gap between Army and non-Army command suicide rates appears to be narrowing. Regular Force males in the Army combat arms occupations had a statistically significant higher suicide rate (31.51/100,000 [95% CI: 25.18, 39.36]) compared to Regular Force males in other occupations (18.20/100,000 [95% CI: 15.31, 21.62]).

Results from the 2019 MPTSRs continue to support a multifactorial causal pathway (this includes biological, psychological, interpersonal, and socio-economic factors) for suicide rather than a direct link between single risk factors (such as Post-Traumatic Stress Disorder (PTSD) or deployment) and suicide. This was consistent with MPTSR findings from previous years.

Conclusions: Suicide rates in the CAF did not increase with any statistical significance over the period of observation described in these findings, and after age standardization they were also not statistically higher than those in the Canadian general population. However, small numbers do limit the ability, or power, of statistical assessments to detect statistical significance. The increased risk in Regular Force males under Army command compared to those under non-Army commands is a finding that continues to be under observation by the CAF.

Keywords: Age-adjusted rate; Canadian Armed Forces; Canadian population; deployment; rate ratio; rates; standardized mortality ratio; suicide.

Résumé

Introduction : Chaque décès par suicide constitue une tragédie. La prévention du suicide est un aspect important de la santé publique et une priorité des Forces armées canadiennes (FAC). Afin de mieux comprendre le suicide au sein des FAC et de parfaire les efforts continus en matière de prévention, les Services de santé des Forces canadiennes effectuent chaque année des analyses pour examiner les taux de suicide et la relation entre le suicide, le déploiement et d'autres facteurs de risque potentiels de suicide. La présente analyse, réalisée par la Direction de la santé mentale (DSM), représente une mise à jour pour la période s'échelonnant de 1995 à 2019.

Méthodes : Le présent rapport décrit les taux bruts de suicide de 1995 à 2019, les comparaisons entre la population canadienne et les FAC au moyen des ratios standardisés de mortalité (RSM) et les taux de suicide selon les antécédents de déploiement au moyen des RSM et de la standardisation directe. On y examine également la variation du taux de suicide selon le commandement/environnement et, au moyen de données tirées des examens techniques des suicides par des professionnels de la santé (ETSPS), la prévalence d'autres facteurs de risque en ce qui concerne les suicides survenus en 2019.

Résultats : Entre 1995 et 2019, il n'y a pas eu d'augmentation statistiquement significative des taux globaux de suicide. Le nombre d'hommes de la Force régulière décédés par suicide n'était pas statistiquement plus élevé que le nombre attendu en fonction des taux de suicide observés chez les hommes dans la population canadienne en général pour chaque période évaluée.

Les ratios des taux de suicide comparant les hommes de la Force régulière selon qu'ils avaient ou non des antécédents de déploiement n'indiquaient pas de lien statistiquement significatif entre le déploiement et un risque accru de suicide. Les constatations les plus récentes (2015 à 2019) révèlent que le taux de suicide chez les militaires ayant pris part à un déploiement était légèrement plus élevé, mais pas statistiquement différent par rapport au taux de ceux qui n'avaient jamais participé à un déploiement (ratio des taux de suicide ajustés selon l'âge : 1,13; intervalle de confiance [IC] à 95 % : 0,59 à 2,16). Ces observations concordent avec la tendance sur 10 ans (2005 à 2014), qui indiquait que les militaires ayant des antécédents de déploiement étaient possiblement plus à risque de suicide que ceux n'ayant pas de tels antécédents (ratio des taux de suicide ajustés selon l'âge : 1,46; IC à 95 % : 0,98 à 2,18).

Ces ratios de taux montrent par ailleurs que, de 2006 à 2019 inclusivement, le fait qu'un militaire fasse partie du commandement de l'Armée de terre était associé à un risque plus élevé de suicide par rapport à un militaire relevant d'un autre commandement (ratio des taux de suicide ajustés selon l'âge : 2,13; IC à 95 % : 1,62 à 2,79). La moyenne mobile du taux de suicide sur trois ans donne à penser que l'écart rétrécit entre le taux de suicide des membres de l'Armée de terre et celui des membres d'autres commandements. Les hommes de la Force régulière appartenant aux groupes professionnels des armes de combat de l'Armée de terre affichaient un taux de suicide plus élevé (31,51/100 000 [IC à 95 % : 25,18 à 39,36]) que celui des hommes de la Force régulière occupant d'autres professions (18,20/100 000 [IC à 95 % : 15,31 à 21,62]), et cet écart était statistiquement significatif.

Les résultats des ETSPS de 2019 continuent d'appuyer la théorie d'un enchaînement de causalité multifactoriel (qui comprend des facteurs biologiques, psychologiques, interpersonnels et socio-économiques) plutôt qu'un

lien direct entre des facteurs de risque individuels (p. ex. l'état de stress post-traumatique ou le déploiement) et le suicide. Ces résultats concordent avec ceux des ETSPS des années précédentes.

Conclusions : Les taux de suicide au sein des FAC n'ont pas augmenté de façon statistiquement significative au cours de la période d'observation décrite et, une fois standardisés selon l'âge, ils n'étaient pas non plus statistiquement supérieurs à ceux de la population canadienne. Toutefois, les petits nombres limitent la capacité ou la probabilité de déceler une signification statistique au moyen des évaluations. Le risque accru de suicide chez les hommes de la Force régulière faisant partie de l'Armée de terre comparativement aux militaires relevant d'un autre commandement est une constatation que les FAC continuent de surveiller.

Mots clés : Déploiement; Forces armées canadiennes; population canadienne; ratio de taux; ratio standardisé de mortalité; suicide; taux; taux ajusté selon l'âge.

Executive Summary

The tragic loss of life of Canadian Armed Forces (CAF) members due to suicide requires ongoing focus to understand these difficult events and to refine CAF suicide prevention efforts. This report describes the suicide experience in the CAF and the epidemiology of Regular Force males that died by suicide between 1995 and 2019, with additional information on the risk factors associated with Regular Force males that died by suicide in 2019.

Methods

Data described in Section 3.1 [Results from the Medical Professional Technical Suicide Review (MPTSR) Reports, Regular Force Males, 2019 Results Only] are drawn from the 2019 MPTSRs. The MPTSR is one of the investigations that follows each CAF suicide. The MPTSR is a quality assurance tool for Canadian Forces Health Services (CFHS) that is requested by the Deputy Surgeon General immediately following the confirmation of all Regular Force and Primary Reserve Force suicides. Each MPTSR is typically conducted by a team consisting of a mental health professional and a General Duty Medical Officer.

Epidemiological data described in Section 3.2 (Epidemiology of Suicide in Regular Force Males, 1995 – 2019, inclusive) and 3.3 (Epidemiology of Suicide in Regular Force Males, by environmental command, 2002 – 2019, inclusive) was obtained from the Directorate of Casualty Support Management up until 2012. As of September 2012, the number of suicides was tracked by DMH. Information on deployment history and CAF population data originated from the Directorate of Human Resources Information Management (DHRIM). Finally, Canadian general population data and suicide counts, by age and sex, were obtained from Statistics Canada.

Frequencies, crude rates, standardized mortality ratios (SMRs) (ratio of observed number of CAF suicides to expected number of CAF suicides, if the CAF were to have the same age and sex makeup as the Canadian general population) and directly standardized rates were calculated. SMRs were calculated until 2018 in this report because Statistics Canada has released data for the Canadian general population only up to that year.

Results

Mental Health Diagnosis of Those Who Died by Suicide in 2019

The mental disorders that were identified among the Regular Force males at the time of their suicide death in 2019 included depressive disorders (28.6%), anxiety disorders (14.3%), post-traumatic stress disorder (21.4%), or other trauma and stress-related disorders (14.3%). A documented substance use disorder was reported in slightly over half (57.1%) of these suicide deaths. It was common (50.0%) for these members to have at least two active mental health problems at the time of death (i.e., a combination that could include: depressive disorders, trauma and stress-related disorders, anxiety disorders, addictions or substance-use disorders, traumatic brain injury or personality disorders).

Work/Life Stressors of Those Who Died by Suicide in 2019

At the time of death, all of the Regular Force males that died by suicide in 2019 were reported to have had at least one prominent work and/or life stressor (such as failing relationship(s), friend/family suicide, family/friend death, family and/or personal illness, debt, professional problems or legal problems); almost all (92.9%) had two or more concomitant stressors prior to their death.

Crude Suicide Rates, 1995 – 2019

In 2015 – 2019, the crude suicide rate for Regular Force males was 24.5 per 100,000 population (95% CI: 19.2, 31.1). This rate was consistent with the 2010-2014 crude rate (24.2/ 100,000 [95% CI: 19.0, 30.9]). Additionally, the suicide rate confidence intervals for all measured periods had some degree of overlap, suggesting a low likelihood of statistically significant differences in the crude rates over time.

Comparison of CAF Regular Force Male Suicide Rates to Canadian Rates Using Standardized Mortality Ratios, 1995 – 2018

The SMR for 2010 – 2014 (126% [95% CI: 99, 159]) and for 2015 – 2018 (119% [95%CI: 90, 156]) both appear to be statistically non-significant, suggesting that, for both time periods, the observed number of Regular Force male suicides was similar to what would be expected in the Canadian male general population if it had the same age distribution. However, the SMR for the 2010 – 2014 period was very close to being statistically significant and warrants some hesitancy in identifying this as statistically non-significant.

Impact of Deployment on CAF Regular Force Male Suicide Rates

SMRs were calculated separately for those with a history of deployment (92% [95%CI: 75, 113]) and those without this history (94% [95%CI: 77, 115]) for the 1995 – 2018 period. These did not identify a statistically significant difference in suicide rates relative to the male Canadian general population when age was taken into account.

Impact of Environmental Command on CAF Regular Force Male Suicide Rates

An age-standardized suicide rate ratio was calculated to compare Army to non-Army commands for the 2002 – 2019 period. This was statistically significant [2.13 (95% CI: 1.62, 2.79)], indicating a higher suicide rate among Regular Force males in the Army command. This finding was supported by a statistically significant higher Army command SMR in the 2007 – 2011 period [173% (95% CI: 123, 237)] and the 2012 – 2016 period (186% [95% CI: 134, 252]), indicating that suicide rates were higher than what would be expected among the male Canadian population with a similar age distribution.

The crude suicide rate among the Regular Force male population who were in an Army combat arms occupation was also calculated and for the 2002 – 2019 period. It was found to be higher than the overall suicide rate among Regular Forces males in other occupations (31.51/ 100,000 [95% CI: 25.18, 39.36]) versus 18.20/ 100,000 [95% CI: 15.31, 21.62]).

Conclusion

Suicide rates in the CAF did not increase with any statistical significance over the period of observation described in these findings, and after age standardization they were also not statistically higher than those in the Canadian general population. However, small numbers do limit the ability, or power, of statistical assessments to detect statistical significance. The increased risk in Regular Force males under Army command compared to those under non-Army commands is a finding that continues to be under observation by the CAF.

Sommaire

Le décès tragique par suicide de membres des Forces armées canadiennes (FAC) requiert une attention continue afin de comprendre ces évènements difficiles et de mieux cibler les efforts de prévention du suicide dans les FAC. Le présent rapport décrit le phénomène du suicide au sein des FAC et l'épidémiologie des suicides chez les hommes de la Force régulière entre 1995 et 2019; il comprend de l'information supplémentaire sur les facteurs de risque associés aux suicides d'hommes de la Force régulière en 2019.

Méthodes

Les données décrites dans la section 3.1 [Résultats des rapports d'examen technique des suicides par des professionnels de la santé, hommes de la Force régulière, année 2019 seulement] sont tirées des ETSPS de 2019. L'ETSPS est l'une des enquêtes effectuées après chaque suicide au sein des FAC. L'ETSPS, un outil d'assurance de la qualité pour les Services de santé des Forces canadiennes (SSFC), est effectué à la demande du médecin général adjoint dès qu'un suicide est confirmé dans la Force régulière ou dans la Première réserve. Chaque ETSPS est généralement mené par une équipe composée d'un professionnel de la santé mentale et d'un médecin militaire généraliste.

La Direction – Gestion du soutien aux blessés a fourni les données épidémiologiques décrites à la section 3.2 (Épidémiologie des suicides chez les hommes de la Force régulière de 1995 à 2019 inclusivement) et à la section 3.3 (Épidémiologie des suicides chez les hommes de la Force régulière, selon le commandement d'armée, de 2002 à 2019 inclusivement) pour la période allant jusqu'à 2012. Depuis septembre 2012, la DSM assure le suivi des données sur le nombre de suicides. Les renseignements sur les antécédents de déploiement et sur le nombre de membres des FAC proviennent de la Direction – Gestion de l'information des ressources humaines (DIRHG). Enfin, les données sur la population canadienne en général et les taux de suicide au Canada en fonction de l'âge et du sexe ont été obtenus auprès de Statistique Canada.

Les mesures calculées incluent les fréquences, les taux bruts, les ratios standardisés de mortalité (RSM; ratio du nombre observé de suicides dans les FAC et du nombre de cas escomptés dans les FAC, si les FAC correspondaient à la population canadienne en général du point de vue de l'âge et du sexe) et les taux standardisés de façon directe. Les RSM ont été calculés jusqu'en 2018, parce que Statistique Canada a publié des données pour la population canadienne en général jusqu'à cette date.

Résultats

Diagnostic de maladie mentale chez les hommes qui sont décédés par suicide en 2019

Au nombre des troubles mentaux connus au moment du décès par suicide chez les hommes de la Force régulière en 2019 figuraient les troubles dépressifs (28,6 %), les troubles anxieux (14,3 %), l'état de stress post-traumatique (21,4 %) ou d'autres troubles liés à des traumatismes et au stress (14,3 %). Dans un peu plus de la moitié (57,1 %) de ces décès par suicide, la personne présentait un trouble lié à la consommation de substances. Il était fréquent (50,0 %) que la personne présente au moins deux diagnostics liés à la santé mentale au moment du décès (c.-à-d. une combinaison qui pouvait comprendre des troubles dépressifs, des troubles liés à des

traumatismes et au stress, des troubles anxieux, des troubles liés à la dépendance ou à la consommation de substances, des traumatismes crâniens ou des troubles de la personnalité).

Facteurs de stress professionnel et personnel chez les hommes qui sont décédés par suicide en 2019

Au moment du décès, au moins un facteur de stress professionnel ou personnel était présent dans tous les cas de suicide survenus en 2019 chez les hommes de la Force régulière (dont les facteurs suivants : échec d'une relation, suicide d'un ami ou d'un membre de la famille, décès d'un ami ou d'un membre de la famille, maladie personnelle ou d'un membre de la famille, dettes, problèmes professionnels, problèmes juridiques). Presque tous les cas (92,9 %) présentaient au moins deux facteurs de stress concomitants avant le décès.

Taux bruts de suicide, 1995 – 2019

Au cours de la période de 2015 à 2019, le taux brut de suicide chez les hommes de la Force régulière s'élevait à 24,5 pour 100 000 (IC à 95 % : 19,2 à 31,1). Ce taux était constant par rapport au taux brut de 2010 à 2014 (24,2/100 000 [IC à 95 % : 19,0 à 30,9]). De plus, les intervalles de confiance des taux de suicide pour toutes les périodes étudiées se chevauchaient dans une certaine mesure, ce qui indique une faible probabilité de différences statistiquement significatives quant aux taux bruts de suicide dans le temps.

Comparaison des taux de suicide chez les hommes de la Force régulière des FAC et au sein de la population canadienne au moyen des ratios standardisés de mortalité, 1995 – 2018

Les RSM pour la période de 2010 à 2014 (126 % [IC à 95 % : 99 à 159]) et pour la période de 2015 à 2018 (119 % [IC à 95 % : 90 à 156]) n'apparaissent pas statistiquement significatifs, ce qui donne à penser que, pour les deux périodes, le nombre observé de suicides chez les hommes de la Force régulière était semblable à ce à quoi on aurait pu s'attendre dans la population générale des hommes au Canada si la répartition par âge était la même. Toutefois, le RSM pour la période de 2010 à 2014 est très proche du seuil de signification et ne devrait pas être considéré d'emblée comme étant non significatif d'un point de vue statistique.

Répercussions des déploiements sur le taux de suicide chez les hommes de la Force régulière des FAC

Les RSM ont été calculés séparément pour les hommes de la Force régulière ayant pris part à une opération de déploiement (92 % [IC à 95 % : 75 à 113]) et ceux pour qui cela n'a jamais été le cas (94 % [IC à 95 % : 77 à 115]) pour la période de 1995 à 2018. Ces résultats n'ont pas révélé de différence statistiquement significative dans les taux de suicide par rapport à la population canadienne de sexe masculin lorsque l'on tient compte de l'âge.

Répercussions du commandement d'armée sur les taux de suicide chez les hommes de la Force régulière des FAC

Un ratio des taux de suicide ajustés selon l'âge a été calculé afin de comparer le commandement de l'Armée de terre aux autres commandements pour la période de 2002 à 2019. Ce ratio était statistiquement significatif (2,13 [IC à 95 % : 1,62 à 2,79]), ce qui indique un taux de suicide plus élevé chez les hommes de la Force régulière

au sein du commandement de l'Armée de terre. Cette constatation était appuyée par un RSM statistiquement plus élevé au sein du commandement de l'Armée de terre au cours de la période de 2007 à 2011 (173 % [IC à 95 % : 123 à 237]) et de la période de 2012 à 2016 (186 % [IC à 95 % : 134 à 252]), ce qui indique que les taux de suicide étaient plus élevés que ce à quoi on s'attendrait chez les hommes canadiens avec une répartition semblable selon l'âge.

Le taux brut de suicide chez les hommes de la Force régulière appartenant aux groupes professionnels des armes de combat de l'Armée de terre a également été calculé et ce, pour la période de 2002 à 2019. On a constaté qu'il était plus élevé que le taux global de suicide chez les hommes de la Force régulière occupant d'autres professions (31,51/100 000 [IC à 95 % : 25,18 à 39,36] par rapport à 18,20/100 000 [IC à 95 % : 15,31 à 21,62]).

Conclusions

Les taux de suicide au sein des FAC n'ont pas augmenté de façon statistiquement significative au cours de la période d'observation décrite et, une fois standardisés selon l'âge, ils n'étaient pas non plus statistiquement supérieurs à ceux de la population canadienne. Toutefois, les petits nombres limitent la capacité ou la probabilité de déceler une signification statistique au moyen des évaluations. Le risque accru de suicide chez les hommes de la Force régulière faisant partie de l'Armée de terre comparativement aux militaires relevant d'un autre commandement est une constatation que les FAC continuent de surveiller.

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2020 Report on Suicide Mortality in the Canadian Armed Forces (1995 to 2019)

1. Introduction

Each death from suicide can have a tragic impact on families, friends, and colleagues. Suicide prevention is an important public health concern in Canada and is a top priority for the Canadian Armed Forces (CAF). The CAF Suicide Prevention Action Plan reflects the CAF's commitment to ensuring that everything that can be done is done to mitigate the risk of suicide. The investigation and analysis of deaths from suicide by CAF members provides valuable information that can assist in guiding and refining ongoing suicide prevention efforts. This annual report is one method used to ensure that clinical and prevention programmes are optimised.

There has been concern since the early 1990s about the rate of suicide in the CAF and its possible relationship to deployment. In response to these concerns, the CAF began a suicide mortality surveillance program to determine the rate of suicide among CAF personnel in comparison to the Canadian general population (CGP), as well as the rate of suicide in those personnel with a history of deployment compared to those without such a history.

Historically the reports have focused on the surveillance and epidemiology of suicide within the CAF. Since 2015, the report has expanded its scope to describe additional information related to suicide in the CAF including an in-depth analysis of the variation of suicide rates by environmental command. This report also provides information on the underlying risk factors that may have contributed to the Regular Force male suicides that took place in 2019 based on an assessment of the Medical Professional Technical Suicide Reviews (MPTSRs).

This report, as in the past, analyses only Regular Force males who have died by suicide. MPTSRs are completed for all CAF deaths from suicide, including Reserve and female members; however, data from those investigations are not included in this analysis for the following reasons:

1) Female suicide numbers are small (range between 0 and 2 events per year), which precludes the ability to conduct trend analyses. In addition, reporting separately on their characteristics would contravene the privacy of the involved individuals ("identity" and "attribute" disclosure[1]).

[1] Statistics Canada defines *identity disclosure* as: "identifying an individual from a table, typically from small cell showing 1 or 2 persons with a characteristic. If no other information is released it is not necessarily a confidentiality breach but the perception of a breach is there. This translates into a "small cell" problem, where, for the purpose of vital statistics, "small" is defined as frequencies representing fewer than 5 births, deaths or stillbirths. "

Attribute disclosure is defined as: "disclosing attributes of individuals, even if they are not specifically identified. For example, a table row where all units share the same attribute because they are found in a single column. This translates into "zero cell" and "full cell" problems. Not all zero cells are problematic. Full cells, which occur when only one cell in a row or column is nonzero, are more likely to be."

Taken from: **Statistics Canada. Disclosure control strategy for Canadian Vital Statistics Birth and Death Databases. Ministry of Industry: Ottawa, 2016[1].**

2) For Reserve Force data there are issues associated with completeness, in addition to concerns with possible identity and attribute disclosure as discussed above. Since many Reserve Force members receive their health care in the provincial health care system, Reserve member reporting and their available records may be incomplete.

3) Since data on suicide attempts is often incomplete, due to differences in its definition and inconsistent reporting by members, and in keeping with other occupational health studies, this report evaluates only deaths from suicide, not attempts. Furthermore, the data used for this analysis include only those who have died of suicide while active in the Regular Forces, and do not include those who have died of suicide after retirement from the military. For more information on Veterans see the 2019 Veteran Suicide Mortality Study [2].

2. Data Sources and Methods

2.1 Data Sources

2.1.1 Medical Professional Technical Suicide Review

Data on suicide risk factors (mental health and psycho-social factors) are collated from the Medical Professional Technical Suicide Reviews (MPTSR). MPTSRs are requested by the Deputy Surgeon General when a death is deemed to have been due to suicide, and are conducted by military medical professionals. This team reviews all pertinent health records and conducts interviews with family members, health care providers, and colleagues who worked with the member and who may be knowledgeable about the circumstances of the death. MPTSRs began in 2010 as a Quality Assurance tool within the Canadian Forces Health Services (CFHS) to provide the Surgeon General with observations and recommendations for optimising suicide prevention efforts within CFHS. All MPTSR information is collected and managed by the Directorate of Mental Health (DMH).

Six mental health factor categories and nine work and life stressor categories were enumerated. Each was identified as present if it was considered to be an active issue around the time of death. The mental health factor categories included:

1) depressive disorders: i) disruptive mood dysregulation disorder; ii) major depressive disorder, single and recurrent episodes; iii) persistent depressive disorder (dysthymia); iv) premenstrual dysphoric disorder; v) substance/medication-induced depressive disorder; vi) depressive disorder due to another medical condition; vii) other specified depressive disorder; and, viii) unspecified depressive disorder.

2) trauma and stressor-related disorders: i) reactive attachment disorder; ii) disinhibited social engagement disorder; iii) posttraumatic stress disorder; iv) acute stress disorder; v) adjustment disorders; vi) other specified trauma- and stressor-related disorder; and, vii) unspecified trauma- and stressor-related disorder.

3) anxiety disorders: i) separation anxiety disorder; ii) selective mutism; iii) specific phobia; iv) social anxiety disorder (social phobia); v) panic disorder; vi) panic attack; vii) agoraphobia; viii) generalized anxiety disorder; ix) substance/medication-induced anxiety disorder; x) anxiety disorder due to another medical condition; xi) other specified anxiety disorder; and xii) unspecified anxiety disorder.

4) addictions or substance-use disorders;

5) traumatic brain injury: considered to be an active issue if it occurred at any time in an individual's past; and

6) personality disorders: considered an active issue if it was identified at any time in an individual's past

The work and life stressor categories included:

1) failed or failing spousal or intimate partner relationship;

2) failed or failing other relationship (e.g. family, friends);

3) completed spousal, family or friend suicide (considered to be an active issue if it had occurred at any time in an individual's past);

4) family or friend death (other than suicide);

5) physical health problem;

6) chronic illness in spouse or family member;

7) excessive debt, bankruptcy or financial strain;

8) job, supervisor or work performance problem; and

9) civil legal problems (e.g. child custody dispute, litigation**).**

2.1.2 Epidemiological Surveillance

Information on the number of suicides and demographic information was obtained from the Directorate of Casualty Support Management (DCSM) up to 2012. As of September 2012, suicides were tracked and data provided by DMH. DMH cross-references their results with those collected by the Administrative Investigation Support Centre (AISC), which is part of the Directorate Special Examinations and Injuries (DSEI).

Information on deployment history and CAF population data (i.e., age, sex, unit, command, Military Occupational Structure ID/Military Occupation code (MOSID/MOC) and deployment history) for active members, as of July 1st of a given year, originated from the Directorate of Human Resources Information Management (DHRIM). History of deployment was based on department IDs and deployment units from DHRIM; deployments included all international assignments with a location outside of Canada and the U.S. and, when determinable, excluded training, exercises, and meetings with international partners. It should be noted that the number of active personnel in a given year and those with a history of deployment occasionally changes from previous reports due to updating of DHRIM records. Additionally, command was categorized into one of four environmental command groupings (Army, Air, Navy, or other command) based on individuals' last specified command or in some cases, unit information.

Canadian suicide counts by age and sex were obtained from Statistics Canada. Data were available up to 2018 at the time of preparation of this report. Canadian suicide rates are derived from death certificate data collected by the provinces and territories and collated by Statistics Canada. Codes utilized for this report were ICD-9 E950-E959 (suicide and self-inflicted injury) in the Shelf Tables produced by Statistics Canada from 1995 to 1999. For 2000 to 2018 the number of suicide deaths was based on ICD-10 codes X60-X84 and Y87.0 utilizing Table 13-10-0392-01 'Deaths and age-specific mortality rates, by selected grouped causes' from Statistics Canada. During Statistics Canada's production of each year's death statistics, data from previous years may have been revised to reflect any updates or changes that had been received from the provincial and territorial vital statistics registrars. Open verdict cases (ICD-9: E980-E989; ICD-10: Y10-Y34, Y87.2) are excluded by Statistics Canada[2], although they are routinely included in suicide statistics reported elsewhere (e.g., UK – both in civilian and military contexts). To ensure valid comparisons, the Statistics Canada exclusions were followed for these analyses. CGP denominators up to 2000 were taken from Statistics Canada CANSIM Table 051-0001; from 2000 onwards, they were taken from Table 17-10-0005-01 'Population estimates on July 1st, by age and sex'. Denominator numbers, up to and including 2015, were final inter-censal estimates; however, while the denominator numbers were final post-censal estimates for 2016, for 2017 and 2018 the estimates were updated post-censal ones.

For the CAF members who died from suicide, information on component, environment, MOSID/MOC, last known department description and last known location were obtained through a request to the Directorate of Human Resources Information Management (DHRIM) or from MPTSR data, with preference given to the MPTSR information when it was present.

Command was ascertained by one of three possible methods:

1) If command was explicitly stated in the MPTSR or in the Suicide Event Report for an individual (2011 – 2019 cases), that command information was used.

2) When information as to which CAF command an individual belonged was not available in the MPTSR or the DCSM/AISC database, individuals were assigned into Army or Non-Army command categories based on their home unit information.

3) In some cases, MOSID and rank were also used to classify individuals if the home unit information was not clear. This subjective method may have led to misclassification of some suicides into an incorrect command, affecting the validity of the results.

MOSID information for the analysis involving the combat arms Army occupations was obtained directly from DHRIM. Individuals were considered to be employed in combat arms Army occupation if they had the following MOSIDs: 00005 (CRMN), 00008 (ARTYMN-FD), 00009 (ARTYMN-AD), 00010 (INFMN), 000178 (ARMD), 000179 (ARTY), 000180 (INF), 000181 (ENGR), 00339 (CBT ENGR) and 00368 (ARTYMN) (since 2012).[3]

[2] Statistics Canada causes of death mapping between ICD-9 and ICD-10, intent of injury not known maps from ICD-9: E980-E989 to ICD-10: Y10-Y34, Y87.2, as per https://www150.statcan.gc.ca/n1/pub/82-003-x/2013007/article/11852/tbl/appb-eng.htm.

[3] Details on the different MOSIDs, including the general duties associated with them, are available at: http://www.forces.gc.ca/en/about-policies-standards-medical-occupations/cf-mosid-task-statements.page.

2.2 Methods

Crude CAF Regular Force male suicide rates were calculated from 1995 to 2019. Suicide rates prior to 1995 have not been calculated as the historical method of ascertainment of suicides within the CAF was not well defined.

To compare CAF Regular Force male suicide rates with the male CGP rates, standardization by age using the indirect method was used to provide Standardized Mortality Ratios (SMRs) for suicide up to 2018. This method controls for the difference in age distribution between the CAF Regular Force male and general Canadian male populations. An SMR is the observed number of cases divided by the number of cases that would be expected in the population at risk based on the age and sex-specific rates of a standard population (the CGP in this case) expressed as a percentage. Therefore, an SMR less than 100% indicates that the population in question has a lower rate than the CGP, while an SMR greater than 100% indicates a higher rate.

SMRs were calculated separately for Regular Force males with and those without a history of deployment, as well as for those in the four environmental command groupings (i.e., Army, Air, and Navy or 'Other').

The calculation of confidence intervals (CIs) for statistics from population data are provided in this report for those who may want to generalize or compare the results between years or to other defined populations. Confidence intervals were calculated for the CAF Regular Force male suicide rates and SMRs directly with Poisson distribution 95% confidence limits using the exact method described by Breslow and Day [3].

Confidence intervals are typically used as a measure of uncertainty around a statistical estimate (e.g., a sample mean or mortality rate) when working with samples from a defined population. However, when statistics such as suicide rates are computed from a completely enumerated population, questions of statistical stability are less relevant to these calculated rates, as everybody in the population is counted. Errors associated with the process of data collection, the coding of cause of death, or in the estimation of the population denominators are usually of greater concern. In such situations, the calculated suicide rate and its confidence intervals simply represent a characterisation of the rate's population distribution and this is based on the assumption that it is distributed according to a known theoretical distribution (e.g., Poisson distribution) around the calculated rate (i.e., some individuals who did not die had a non-zero probability of death from suicide). This permits a comparison of one population's rates, and distribution, to those of another population (e.g., populations characterized by year); confidence intervals provide some guidance as to whether the two population estimates are comparable (i.e., when confidence intervals overlap) or different (i.e., when confidence intervals do not overlap) with a certain level of statistical probability. The p=0.05 level is used to determine whether two population distributions are different with statistical significance.

Direct standardization, standardized to the age structure of the total male Regular Force population, was also used for two comparisons. In order to further compare suicide risk between Regular force males with a history of deployment versus those without such a history and between members in the Army command versus those in non-Army commands, standardized rate ratios with 95% confidence intervals were computed as outlined in Rothman and Greenland [4].

Because the annual suicide numbers for the Canadian Armed Forces are small, they are influenced by random annual variability. Moving averages, which take an average of the year of interest as well as the previous and

following year[4], have been used by others in a similar military suicide context [5]. This method attempts to control the aforementioned annual variability caused by small numbers and provides a snapshot of potential temporal trends in the data.

3. Results

3.1 Results from the Medical Professional Technical Suicide Review Reports, Regular Force Males, 2019 Results Only

3.1.1 Mental Health Factors

MPTSRs were completed on 14 of the 15 2019 CAF Regular Force male suicides;[5] and a trial dual-purpose Board of Inquiry (BOI) review was completed for one individual. Among the CAF members for whom data was collected, 13 (92.9%) had at least one of the mental health factors in Table 1 identified as an active issue. The 'addictions or a substance use disorder' mental health factor was most frequent, identified in eight (57.1%) individuals. The trauma and stress-related disorders category was the next most prevalent with a total of five (three (21.4%) individuals having PTSD and two (14.3%) individuals having other disorders in this category). Depressive disorder was recorded in four (28.6%) individuals, and two (14.3%) individuals had an anxiety disorder. Two individuals had a traumatic brain injury in the past; one individual had the injury within a year prior to death while the other individual had two such injuries but more than a year prior to death.

Documented evidence of prior suicidal ideation and/or prior suicide attempts was noted for four (28.6%) individuals (not shown). Overall, seven (50.0%) individuals had at least two of the mental health factors listed in Table 1 at the time of death.

The MPTSR does not provide an indication as to whether these mental health concerns were related to operational stress[6]; however, it does attempt to provide an indication as to whether the suicide was related to a deployment and for this query, 'no' or 'unknown' was recorded for all 14 individuals with a completed MPTSR.

[4] For example, the moving average value for 2006 would be an average of 2005, 2006 and 2007. For 2002 where there is no prior year, the moving average was based on two years' worth of data (e.g., 2002 = average of 2002 and 2003). For 2019, where there is no subsequent year, the data point is suppressed, as it is not a true moving average.

[5] All 15 of the 2019 Regular Force male suicides were investigated. One investigation was a trial of a blended MPTSR and BOI format so the data collected did not exactly match the categories of the MPTSR format. This investigation was not included in the 2019 analysis of MPTSR data.

[6] As defined in the Surgeon General's Mental Health Strategy, "*... the term "Operational Stress Injury" (OSI) is not a diagnosis; rather it is a grouping of diagnoses that are related to injuries that occur as a result of operations. The most common OSIs are PTSD, major depression and generalized anxiety. This term has helped break down several barriers to care and reduce the stigma surrounding mental illness.*"

Table 1: Mental Health Factors.

Mental health factor		2019 (N (%)) [a]
i)	Depressive disorders	4 (28.6%)
ii)	Trauma and stress-related disorders:	5 (35.7%)
	PTSD	3 (21.4%)
	Other	2 (14.3%)
iii)	Anxiety disorders	2 (14.3%)
iv)	Addictions or a substance-use disorder	8 (57.1%)
v)	Traumatic brain injury (ever)	2 (14.3%)
vi)	Personality disorders (ever identified)	1 (7.1%)

[a] The total does not equal 100% as not all individuals were diagnosed with a mental health factor at time of death, and some individuals had more than one of the mental health factors listed.

3.1.2 Work and Life Stressors

Work and life stressors identified for the Regular Force male suicide deaths in 2019 are listed in Table 2. All individuals had at least one reported stressor and 13 (92.9%) individuals had two or more. The most prevalent stressor was a failed or failing spousal or intimate partner relationship, identified in 10 (71.4%) individuals.

Table 2: Prevalence of Documented Work and Life Stressors Prior to Suicide.

Work and life stressors	2019 (N (%)) [a]
Failed or failing spousal or intimate partner relationship	10 (71.4%)
Failed or failing other relationship (e.g. family, friends)	5 (35.7%)
Completed spousal, family or friend suicide (ever) [b]	4 (28.6%)
Family or friend death (other than suicide)	2 (14.3%)
Physical health problem	7 (50.0%)
Chronic illness in spouse or family member	2 (14.3%)
Excessive debt, bankruptcy or financial strain	6 (42.9%)
Job, supervisor or work performance problem:	7 (50.0%)
Civil legal problems (e.g. child custody dispute, litigation)	2 (14.3%)

[a] The total does not equal 100% as thirteen individuals had more than one stressor.

[b] Determined to be an active concern if it occurred during an individual's life history.

In addition to these stressors, six (42.9%) individuals had a documented history of being a victim of physical, sexual and/or emotional abuse or assault during their lifetime. There were five (35.7%) individuals who had been experiencing some sort of legal, disciplinary or 'other' proceedings prior to their death. There were two (14.3%) individuals who were in the process of being released from the CAF; one was a voluntary release that was initiated by the service member and the other was to be a 5b release that was initiated be the member's chain of command.

3.2 Epidemiology of Suicide in Regular Force Males, 1995 – 2019, Inclusive

The annual number of male Regular Force suicides between 1995 and 2019, inclusive, are captured in Table 3, as are the corresponding 5-year crude rates. These 5-year crude CAF Regular Force male suicide rates did not appear to vary significantly over 1995 and 2019, but did range from a low of 18.5 per 100,000 population (95% CI: 13.8, 24.4) for the 2005 – 2009 period to a high of 24.5 per 100,000 (95% CI: 19.2, 31.3) in the more recent 2015 – 2019 period. The confidence intervals for all 5-year time periods do have substantial overlap and this suggests that the time period differences were not statistically significant.

Regular Force female rates were not calculated because female suicides were uncommon. There were no suicides in females from 1995 to 2002, two in 2003, no suicides in females in 2004 and 2005, one per year from 2006 to 2008, two in 2009, none in 2010, one in 2011, three in 2012, one in 2013, one in 2014, one in 2015, one in 2016, none in 2017 or 2018, and two in 2019.

An SMR comparison of suicide rates among Regular Force males to their civilian counterparts is presented in Table 4. The 2005 to 2009 data indicate that the CAF Regular Force male population had a 14% lower suicide rate than the CGP after adjusting for the age differences between the populations. This SMR is not statistically significant as the confidence interval includes 100%. While the SMR for 2010 – 2014 is above 100%, its confidence interval also includes 100% and although this suggests that the result is statistically non-significant, some caution in interpretation is advised as it was very close to being statistically significant. The 2015-2018 (4-year) SMR was statistically non-significant.

A further analysis comparing SMRs for members with a history of deployment to SMRs for those without a history of deployment is presented in Table 5. For the four-year period between 2015 and 2018, the higher SMR switched, relative to the prior five year period, from those with a history of deployment to those without one; additionally, the SMR for this 2015 to 2018 period appeared to be statistically significant for those without a history of deployment. None of the other SMRs presented here (for any time period) were indicated to be statistically significant.[7]

[7] In the 2017 report ("2017 Report on Suicide Mortality in the Canadian Armed Forces (1995 to 2016)"), the four-year SMR for 2010-2013 reflected a (non-significantly) lower age-adjusted rate in those with a history of deployment than in those without. With the addition of 2014 data to the SMR calculations, the (non-significant) 2010-2014 SMR now suggests that the age-adjusted rate for those with a history of deployment was once again higher than the equivalent age-adjusted rate for those without a history of deployment. This also serves to illustrate the instability of the rates reported here, and why they must be interpreted with caution.

Table 3: CAF Regular Force Male Multiyear Suicide Rates (1995 – 2019) [b]

Year	Number of CAF Regular Force Male Person-Years[8]	Number of CAF Regular Force Male Suicides [a]	CAF Regular Force Male Suicide Rate per 10^5 (95% CI)
1995	62 255	12	
1996	57 323	8	
1997	54 982	13	
1998	54 284	13	
1999	52 689	10	
1995 – 1999	**281 533**	**56**	**19.9 (15.1, 26.0)**
2000	51 537	12	
2001	51 029	10	
2002	52 458	9	
2003	54 151	9	
2004	52 265	10	
2000 – 2004	**261 440**	**50**	**19.1 (14.2, 25.2)**
2005	53 666	10	
2006	54 332	7	
2007	55 188	9	
2008	55 774	13	
2009	56 909	12	
2005 – 2009	**275 869**	**51**	**18.5 (13.8, 24.4)**
2010	56 231	12	
2011	56 213	21	
2012	56 117	10	
2013	56 134	9	
2014	55 724	16	
2010 – 2014	**280 419**	**68**	**24.2 (19.0, 30.9)**
2015	55 575	14	
2016	56 465	14	
2017	56 406	13	
2018	56 699	13	
2019	**57 052**	15	
2015–2019	**282 197**	**69**	**24.5 (19.2, 31.1)**

[a] The number of confirmed suicides for CAF Regular Force males for 2009 increased by one since the "Suicide in the Canadian Forces 1995 to 2012" report.

[8] Person time is defined as "*a measurement combining person and time as the denominator in incidence and mortality rates when, for varying periods, individual subjects are at risk of developing disease or dying. It is the sum of the periods of time at risk for each of the subjects.* ***The most widely used measure is person-years,***" (emphasis added) [6].

[b] Some estimates may have changed slightly compared to previous reports due to updates in the CAF Regular Force male population numbers.

Table 4: Comparison of CAF Regular Force Male Suicide Rates to Canadian Male Rates Using Standardized Mortality Ratios (SMRs) (1995 – 2018) [a]

Year	SMR for Suicide (95% Confidence Intervals)
1995 – 1999	72% (55, 94)[†]
2000 – 2004	80% (60, 106)
2005 – 2009	86% (64, 114)
2010 – 2014	126% (99, 159)
2015 – 2018[**]	119% (90, 156)

[a] Some estimates may have changed slightly compared to previous reports due to updates in either the CAF Regular Force male population numbers or Statistics Canada's reported vital statistics and Canadian male population estimates.

[**] Based on four years of observations only to 2018 because Statistics Canada data for 2019 was not available at time this report was prepared.

[†] Statistically significant.

Table 5: Standardized Mortality Ratios for Suicide in the CAF Regular Force Male Population by History of Deployment (1995 – 2018) [a]

Year	SMR (95% CI) for those With a History of Deployment	SMR (95% CI) for those Without a History of Deployment
1995 – 1999	68% (42, 105)	74% (52, 103)
2000 – 2004	81% (53, 120)	79% (51, 118)
2005 – 2009	99% (67, 141)	73% (45, 112)
2010 – 2014	121% (87, 165)	111% (74, 162)
2015 – 2018[**]	90% (56, 136)	153% (105, 216)[†]

[a] Some estimates may have changed slightly compared to previous reports due to updates in either the CAF Regular Force male population numbers or Statistics Canada's reported vital statistics and Canadian male population estimates.

[**] Based on four years of observations only to 2018 because Statistics Canada data for 2019 was not available at time this report was prepared.

[†] Statistically significant.

When looking at longer time periods, the Regular Force males with a history of deployment, and those without this history, did not appear to have a suicide rate that was different from what would be expected in the Canadian male population after adjusting for age distribution differences. The 10-year rate for the 1995 – 2004 period illustrated a slightly lower SMR for those with a history of deployment (SMR: 75% [95% CI: 54%, 100%]) than for those without this history (SMR: 77% [95% CI: 60%, 100%]); however, both of these estimates closely approached, but did not reach, statistical significance. Similarly, there was no statistically significant difference in the 10-year SMRs for the 2005 – 2014 period among those with a history of deployment (SMR: 111% [95% CI: 87%, 140%]) or for those without this history (SMR: 91% [95% CI: 68%, 121%]), indicating no difference relative to what was expected in the age-adjusted CGP.

An analysis comparing the same groups but using a statistically different method (direct standardization) is presented in Table 6 and it also failed to identify a statistically significant relationship between those with a history of deployment versus those without such a history. A comparison of the 10-year directly standardized rates by deployment history for the 1995 – 2004 and 2005 – 2014 periods both appeared to be statistically non-significant, with age-standardized suicide rate ratios of 1.02 (95% CI: 0.68, 1.52) and 1.46 (95% CI: 0.98, 2.18), respectively. However, the rate ratio for the 2005 – 2014 period, which indicated a higher rate among those with a history of deployment, was close to being statistically significant.

Table 6: Comparison of CAF Regular Force Male 5-Year Suicide Rates by Deployment History Using Direct Standardization (1995 – 2019) [a]

Year	History of Deployment (Rate per 10^5)	No History of Deployment (Rate per 10^5)	Suicide Rate Ratio (95% CI)
1995 – 1999	19.83	19.90	1.00 (0.57, 1.75)
2000 – 2004	18.97	17.89	1.06 (0.60, 1.88)
2005 – 2009	24.85	15.60	1.59 (0.86, 2.97)
2010 – 2014	25.79	19.07	1.35 (0.80, 2.28)
2015 – 2019	30.30	26.91	1.13 (0.59, 2.16)

[a] Some estimates may have changed slightly compared to previous reports due to updates in CAF Regular Force male population numbers.

3.3 Epidemiology of Suicide in Regular Force Males, by Environmental Command, 2002 – 2019, Inclusive

Over the past 18 years, there were 122 deaths by suicide among the Regular Force males within the Army command and 94 within the other commands combined (Navy, Air Force and Other). The crude Army suicide rate was 32.88 per 100,000 population (95% CI: 27.43, 39.39) compared to 14.97 per 100,000 population (95% CI: 12.17, 18.45) for the non-Army rate. The confidence intervals for these two command rates (i.e., Army and non-Army) did not overlap, indicating that there was a statistically significant difference between the two groups. The age-adjusted, directly standardized, rates (Army: 32.35/ 100,000 [95% CI: 26.44, 38.27]; Non-Army: 15.22/ 100,000 [95% CI: 12.12, 18.31]) were very similar to the crude rates. Furthermore, the age-standardized suicide

rate ratio was significant (2.13 [95% CI: 1.62, 2.79]), indicating that the age-standardized suicide rate among Regular force males in the Army was a little over twice as high as it was in the non-Army commands.

SMRs (i.e., comparisons with the CGP) were calculated for each command grouping and time period (i.e., 2002 – 2006, 2007 – 2011, 2012 – 2016, 2017 – 2018 only) (**Table 7**). The SMRs for the Army command in the 2007 – 2011 and 2012 – 2016 periods were both statistically significant and above 100%, while the SMRs for the Navy/Other command group in the 2002 –2006, 2012 – 2016, and 2017 – 2018 periods were statistically significant and below 100%. All other SMRs were not statistically significant. Furthermore, the SMR for all commands combined was systematically not statistically significant across all four time periods.

Table 7: Standardized Mortality Ratios for Suicide in CAF Regular Force Males by Environmental Command (2002 – 2018) [a]

Environmental Command	SMR for Suicide (95% Confidence Intervals), 2002 – 2006	SMR for Suicide (95% Confidence Intervals), 2007 – 2011	SMR for Suicide (95% Confidence Intervals), 2012 – 2016	SMR for Suicide (95% Confidence Intervals), 2017-2018*
Army	105% (66, 159)	173% (123, 237)†	186% (134, 252)†	173% (97, 286)
Air Force	76% (36, 140)	80% (38, 147)	89% (44, 159)	189% (87, 360)
Navy/Other	51% (27, 87)†	73% (44, 116)	41% (20, 75)†	21% (3, 77)†
All Commands	76% (55, 101)	112% (88, 144)	106% (82, 137)	114% (74, 168)

[a] Some estimates may have changed slightly compared to previous reports due to updates in either the CAF Regular Force male population numbers or Statistics Canada's reported vital statistics and Canadian male population estimates.

† Statistically significant.

* Based on two years of observations

The suicide rate in Army combat arms occupations in the Regular Force male population was also calculated. Between 2002 and 2019, there were a total of 81 suicides among Regular Force males who had an Army combat arms MOSID. There were no suicides during this time frame in females with an Army combat arms MOSID.

The suicide rate in the Regular Force male population who were in an Army combat arms occupation appeared to be higher than the overall suicide rate among Regular Force males who were in other occupational groups. The crude suicide rates for the 2002 – 2019 period were 31.51 per 100,000 population (95% CI: 25.18, 39.36) the Army combat arms occupation group versus 18.20 per 100,000 population (95% CI: 15.31, 21.62) for those in other occupations. As the confidence intervals between the two rates did not overlap, the difference appears to be statistically significant, indicating an increased risk of suicide in Regular Force males in the Army combat arms relative to those in other occupations.

Figure 1 presents the three-year suicide rate moving average trend (i.e., suicide rates computed for consecutive three year periods that are incremented one year at a time) for all commands combined (represented by the triangular markers), Army command only (represented by the diamond markers) and for the Non-Army commands (represented by the square markers); the three-year moving average rates are reported against the middle year (e.g., the rates for 2017, 2018, and 2019 are incorporated into the moving average reported against 2018) . This figure illustrates that the suicide rate among the Army command had been slightly higher or equal to the rate among all other commands combined for the period up until 2008; however, in a period that began

in 2009, the suicide rate exhibited a pronounced increase among the Army command compared with the other commands. This rise in the Army suicide rate appeared to have stopped post-2012, but the average remained well above pre-2010 levels. Between 2010 and 2013, the non-Army suicide rate moving average appeared to be decreasing, but subsequently returned to pre-2011 levels. Since 2012, it would appear that the differential between the crude Army and Non-Army suicide rates had been declining and has become more comparable in recent years.

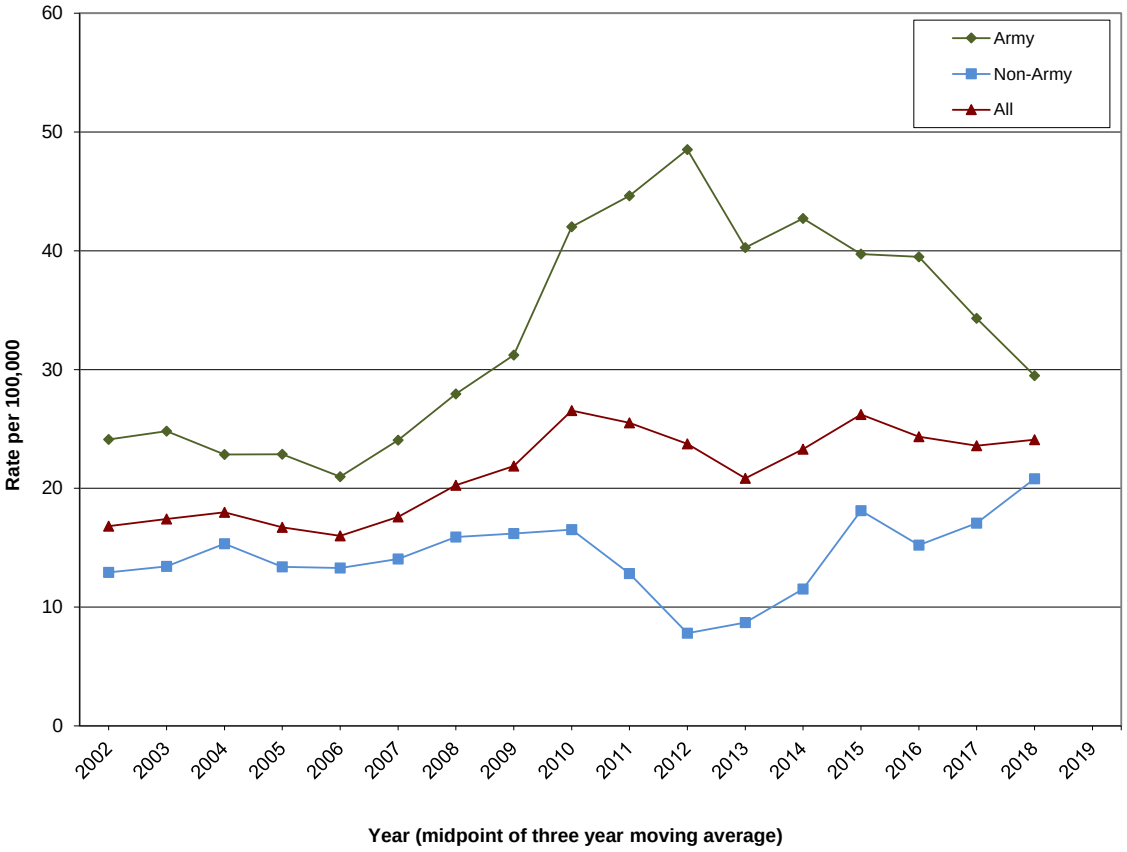

Figure 1: Three Year-Moving Averages by Command, Canadian Armed Forces, 2002 – 2019

4. Data Limitations

1) The numbers on which these analyses are based are small and vary from year-to-year; consequently, these findings must be interpreted with caution.

2) Female suicide numbers are very small (range between zero and two events per year), which precludes the ability to conduct trend analyses.

3) Since an individual's last known unit/base was used to categorize environmental command, this did not take into account that the individual may have just recently been posted to that environmental command and therefore not have functioned under that environmental command for an appreciable amount of time.

4) The denominator data for this study (number of CAF Regular Force males in each environmental command) were taken from the DHRIM system which occasionally receives data updates. Consequently, denominator data may vary, depending on when the report was run by DHRIM.

5) The lack of DHRIM data prior to 2002 makes it impossible to ascertain whether the pre-Afghanistan suicide experience for Army command relative to non-Army command was any different to what is described here.

6) Finally, the wide confidence intervals for many of the rates reported here indicate that the analyses may not have the power to detect statistically significant differences.

5. Conclusions

The following conclusions of the 2020 analysis of CAF Regular Force male deaths due to suicide are consistent with those of past years and should be considered with the limitations discussed above in mind:

1) from 1995 to 2019, there has been no statistically significant change in the overall suicide rate of CAF Regular Force males;

2) the rate of suicide among CAF Regular Force males, when standardized for age and sex, is not significantly different from that of the CGP;

3) assessment of the 2019 MPTSRs continues to support a multifactorial causal pathway for suicide rather than a direct link with a single risk factor. There was a high prevalence of mental health factors (92.9% having one active disorder, and 50% having at least two), failing relationships [including spousal/intimate (71.4%) and other (35.7%)], physical health problems (50.0%), job, supervisor or work performance problems (50.0%) and excessive debt (42.9%); and,

4) analyses suggest that there is a significantly higher crude rate of suicide in Regular Force males in the Army command relative to other CAF commands. This may be driven in part by the significant difference in the crude Regular Force male suicide rate among the Army combat arms trades relative to those in other trades.

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12. ABSTRACT (Brief and factual summary of the document.)

Introduction: Each death from suicide is tragic. Suicide prevention is an important public health concern and is a top priority for the Canadian Armed Forces (CAF). In order to better understand suicide in the CAF and refine ongoing suicide prevention efforts, the Canadian Forces Health Services annually examine suicide rates and the relationship between suicide, deployment and other potential suicide risk factors. This analysis, conducted by the Directorate of Mental Health (DMH), is an update covering the period from 1995 to 2019.

Methods: This report describes crude suicide rates from 1995 to 2019, comparisons between the Canadian population and the CAF using Standardized Mortality Ratios (SMRs), and suicide rates by deployment history using SMRs and direct standardization. It also examines variation in suicide rate by environmental command, and uses data from Medical Professional Technical Suicide Reviews (MPTSR) to examine the prevalence of other suicide risk factors for suicide deaths that occurred in 2019.

Results: Between 1995 and 2019, there were no statistically significant increases in the overall suicide rates. The number of Regular Force males that died by suicide was not statistically higher than that expected based on male suicide rates in the Canadian General Population (CGP) for each time period that was evaluated.

Rate ratios comparing Regular Force males with a history of deployment to those without this history did not establish a statistically significant link between deployment and increased suicide risk. The most recent findings (2015 – 2019) suggest that the suicide rate in those with a history of deployment was slightly higher but not statistically different when compared to those with no history of deployment (age-standardized suicide rate ratio: 1.13 [95% CI: 0.59, 2.16]). This is concordant with the 10-year (2005 – 2014) pattern which indicated that those with a history of deployment were possibly at a higher risk of suicide than those with no such history (age-adjusted suicide rate ratio: 1.46 [95% CI: 0.98, 2.18]).

These rate ratios also highlighted that, since 2006 and up to and including 2019, being part of the Army command was associated with a higher risk of suicide relative to those who were part of the other environmental commands (age-standardized suicide rate ratio: 2.13 [95% CI: 1.62, 2.79]). The 3-year suicide rate moving average suggested that the gap between Army and non-Army command suicide rates appears to be narrowing. Regular Force males in the Army combat arms occupations had a statistically significant higher suicide rate (31.51/100,000 [95% CI: 25.18, 39.36]) compared to Regular Force males in other occupations (18.20/100,000 [95% CI: 15.31, 21.62]).

Results from the 2019 MPTSRs continue to support a multifactorial causal pathway (this includes biological, psychological, interpersonal, and socio-economic factors) for suicide rather than a direct link between single risk factors (such as Post-Traumatic Stress Disorder (PTSD) or deployment) and suicide. This was consistent with MPTSR findings from previous years.

Conclusions: Suicide rates in the CAF did not increase with any statistical significance over the period of observation described in these findings, and after age standardization they were also not statistically higher than those in the Canadian general population. However, small numbers do limit the ability, or power, of statistical assessments to detect statistical significance. The increased risk in Regular Force males under Army command compared to those under non-Army commands is a finding that continues to be under observation by the CAF.

Introduction : Chaque décès par suicide constitue une tragédie. La prévention du suicide est un aspect important de la santé publique et une priorité des Forces armées canadiennes (FAC). Afin de mieux comprendre le suicide au sein des FAC et de parfaire les efforts continus en matière de prévention, les Services de santé des Forces canadiennes effectuent chaque année des analyses pour examiner les taux de suicide et la relation entre le suicide, le déploiement et d'autres facteurs de risque potentiels de suicide. La présente analyse, réalisée par la Direction de la santé mentale (DSM), représente une mise à jour pour la période s'échelonnant de 1995 à 2019.

Méthodes : Le présent rapport décrit les taux bruts de suicide de 1995 à 2019, les comparaisons entre la population canadienne et les FAC au moyen des ratios standardisés de mortalité (RSM) et les taux de suicide selon les antécédents de déploiement au moyen des RSM et de la standardisation directe. On y examine également la variation du taux de suicide selon le commandement/environnement et, au moyen de données tirées des examens techniques des suicides

par des professionnels de la santé (ETSPS), la prévalence d'autres facteurs de risque en ce qui concerne les suicides survenus en 2019.

Résultats : Entre 1995 et 2019, il n'y a pas eu d'augmentation statistiquement significative des taux globaux de suicide. Le nombre d'hommes de la Force régulière décédés par suicide n'était pas statistiquement plus élevé que le nombre attendu en fonction des taux de suicide observés chez les hommes dans la population canadienne en général pour chaque période évaluée.

Les ratios des taux de suicide comparant les hommes de la Force régulière selon qu'ils avaient ou non des antécédents de déploiement n'indiquaient pas de lien statistiquement significatif entre le déploiement et un risque accru de suicide. Les constatations les plus récentes (2015 à 2019) révèlent que le taux de suicide chez les militaires ayant pris part à un déploiement était légèrement plus élevé, mais pas statistiquement différent par rapport au taux de ceux qui n'avaient jamais participé à un déploiement (ratio des taux de suicide ajustés selon l'âge : 1,13; intervalle de confiance [IC] à 95 % : 0,59 à 2,16). Ces observations concordent avec la tendance sur 10 ans (2005 à 2014), qui indiquait que les militaires ayant des antécédents de déploiement étaient possiblement plus à risque de suicide que ceux n'ayant pas de tels antécédents (ratio des taux de suicide ajustés selon l'âge : 1,46; IC à 95 % : 0,98 à 2,18).

Ces ratios de taux montrent par ailleurs que, de 2006 à 2019 inclusivement, le fait qu'un militaire fasse partie du commandement de l'Armée de terre était associé à un risque plus élevé de suicide par rapport à un militaire relevant d'un autre commandement (ratio des taux de suicide ajustés selon l'âge : 2,13; IC à 95 % : 1,62 à 2,79). La moyenne mobile du taux de suicide sur trois ans donne à penser que l'écart rétrécit entre le taux de suicide des membres de l'Armée de terre et celui des membres d'autres commandements. Les hommes de la Force régulière appartenant aux groupes professionnels des armes de combat de l'Armée de terre affichaient un taux de suicide plus élevé (31,51/100 000 [IC à 95 % : 25,18 à 39,36]) que celui des hommes de la Force régulière occupant d'autres professions (18,20/100 000 [IC à 95 % : 15,31 à 21,62]), et cet écart était statistiquement significatif.

Les résultats des ETSPS de 2019 continuent d'appuyer la théorie d'un enchaînement de causalité multifactoriel (qui comprend des facteurs biologiques, psychologiques, interpersonnels et socio-économiques) plutôt qu'un lien direct entre des facteurs de risque individuels (p. ex. l'état de stress post-traumatique ou le déploiement) et le suicide. Ces résultats concordent avec ceux des ETSPS des années précédentes.

Conclusions : Les taux de suicide au sein des FAC n'ont pas augmenté de façon statistiquement significative au cours de la période d'observation décrite et, une fois standardisés selon l'âge, ils n'étaient pas non plus statistiquement supérieurs à ceux de la population canadienne. Toutefois, les petits nombres limitent la capacité ou la probabilité de déceler une signification statistique au moyen des évaluations. Le risque accru de suicide chez les hommes de la Force régulière faisant partie de l'Armée de terre comparativement aux militaires relevant d'un autre commandement est une constatation que les FAC continuent de surveiller.

13. KEYWORDS, DESCRIPTORS or IDENTIFIERS (Technically meaningful terms or short phrases that characterize a document and could be helpful in cataloguing the document. Use semi-colons as delimiters.)

Age-adjusted rate; Canadian Armed Forces; Canadian population; deployment; rate ratio; rates; standardized mortality ratio; suicide

Déploiement; Forces armées canadiennes; population canadienne; ratio de taux; ratio standardisé de mortalité; suicide; taux; taux ajusté selon l'âge.

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