



# Canadian paramedic health and wellness project

## *Workforce profile and health and wellness trends*

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*June 21, 2017*

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The Research Ethics Board's at Wilfrid Laurier University and the University of Waterloo have reviewed and approved the research protocols used in this study to gather data from human participants in accordance with Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, 2nd edition (TCPS 2).

## Abstract

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**Introduction:** We know very little about paramedics in Canada, or about how their service to Canadian's might affect their health and wellness. The primary objective of this project was to gather baseline information to describe the workforce trends, sociodemographics, and current health and wellness of paramedics in Canada.

**Methods:** Data were collected using a multi-phased approach. Phase 1 involved administering a comprehensive survey to approximately 38,000 paramedics across the country. Phase 2 involved conducting in-depth focus group and personal interviews to further examine the topic of mental wellness. Phase 3 involved conducting physical fitness appraisals to further probe the topic of physical wellness.

**Results:** In Phase 1, 2,557 completed surveys were returned (2,488 web and 69 paper). Nearly 4 in 5 paramedics work 12-hour shifts, where 3 in 5 paramedic do so by rotating between day, night and evening shifts, and where nearly 4 in 5 also work required overtime. Survey and focus group findings identify indications of decline mental wellbeing, where *Operational Factors*; *Organizational Climate Factors*; and, *Barriers to Good Mental Health* were identified as pressing challenges. Survey and physical fitness appraisal results identify indications of injury, fatigue and burnout, but suggest that musculoskeletal health and fitness are in-line with normative data.

**Conclusion:** Regardless of the geographical location of the paramedics, results reveal that paramedic's work situations are similar and that their overall health and wellness are not ideal. Moving forward, it is important that effective pan-Canadian strategies are initiated to improve the health of paramedics, strengthening the ability of paramedic services to maintain an effective, capable workforce to continue supporting public safety in Canada through the provision of timely and effective pre-hospital emergency care.

## **Significance for Defence and Security**

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Maintaining a viable, healthy workforce of paramedics is paramount to protect the health, wellbeing and safety of Canadians. Descriptive data gathered through this project indicate that many paramedics are forced to take leave, often for medical and health related reasons. Moreover, paramedics' scores on several indicators of health and wellness indicate a declined state of overall health and well-being. This report provides a potential warning sign indicating declined health and wellness among paramedics across Canada, which could jeopardize the long-term availability of a viable, healthy workforce.

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# 1 Introduction

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In 2014, the Canadian Safety and Security Program (CSSP) outlined a series of investment priorities. Investment Priority 31 stated a need to identify and document the workforce profile and sociodemographic trends of the paramedic community across Canada. Specifically, priority 31 highlighted that workforce profile and sociodemographic data are essential to inform organizational and service-based decisions pertaining to key policies and protocols regarding levels of service, resource deployment, clinical benchmarking, policy, training, recruitment and retention. To address this priority, the *Canadian Paramedic Health and Wellness* project was undertaken, generating data on the current workforce trends within the paramedic community across Canada and highlighting paramedic health and wellness, where health and wellness may be a fundamental determinant of the operational readiness of the paramedic workforce.

For the purpose of this project, the workforce profile was defined as a description of essential: 1) sociodemographic data and characteristics (e.g., years, experience, gender, etc.); 2) internal workforce trends (e.g., shift length and type, coverage area type, etc.); and, 3) health and wellness indicators (i.e., scores on established health-related survey instruments such as the Short Form-36, Depression Anxiety Stress Scales, etc.). Sociodemographic and workforce trends data provide essential information that can inform operational and staffing decisions as indicated by the investment priority. The operational definition of a workforce profile for this project is consistent with a similar effort in the United States of America through the U.S. *Longitudinal Emergency Medical Technicians (EMT) Attributes and Sociodemographics Study* (LEADS) (Brown et al., 2002). Indicators of health and wellness (i.e., physical and/or mental health disability) are fundamental determinants affecting the availability of a healthy, capable, paramedic workforce. Survey insights can inform if, and where processes, policies, and programs may be necessary to improve and protect paramedics' health and wellness.

Paramedics are exposed to a number of factors that can affect their mental and/or physical health, and ultimately, their readiness and availability to work. With reference to physical injury, in services outside of Canada paramedics have an estimated annual injury rate of 34.6 per 100 full time workers (Maguire et al., 2005; 2014). If similar rates persist in Canada, this rate would be well above the Canadian national average of 6.6 injuries per 100 full time workers per year. With respect to mental health disability, Sterud et al. (2006) reported that at least 20% of paramedics report PTSD symptoms; this is well above the 5% and 10% proportions reported within the general population of males and females respectively. Presently, there are no data available describing the physical and mental health status of paramedics across Canada. This is an important gap to address, particularly since the paramedic profession has a high rate of early retirement on the basis of medical grounds (Rogers, 1998). While the CSSP priority identifies the need to understand the workforce profile, the research is clear that health impairment (physical or mental) is also a significant concern directly related to the availability of healthy, able, paramedics.

The *Canadian Paramedic Health and Wellness* project produced two outcomes that are important to the paramedic community and that address the investment priority described above. First, a survey instrument the “*Canadian Paramedic Health and Wellness Survey*” (CPHWS) was developed, validated, translated, and circulated to the paramedic community (e.g., CSSP – Paramedic Community of Practice, Paramedic Chiefs of Canada (PCC), Paramedic Association of Canada (PAC)). This enables these organizations to champion the re-administration of the survey

in the future to monitor changes over time within the paramedic community. Second, the inaugural iteration of the CPHWS gathered critical information for the paramedic community, described in this report, offering detailed data on the current sociodemographics, workforce capabilities, and health and wellness of the paramedic workforce.

The objective of this report is to describe the methodology and results of the *Canadian Paramedic Health and Wellness* project. Where possible, findings are interpreted with respect to normative data from the Canadian population, where available, to add context. Lastly, based on the data, recommendations and suggestions are offered in effort to inform paramedic services and organizations (e.g., PCC, PAC, the CSSP Paramedic Community of Practice, etc.) of ways to maintain and/or improve the health and wellness of paramedics, ensuring the long-term operational readiness of a healthy, capable, paramedic workforce.

## 2 Methodology

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A phase-gated approach was implemented to complete the *Canadian Paramedic Health and Wellness* project. After establishing a project advisory committee including representation from the County of Frontenac, PAC, PCC, DRDC CSS, and the Canadian Union of Public Employees (CUPE), the research team completed three phases. Phase 1 was the development and administration of the *Canadian Paramedic Health and Wellness Survey* (CPHWS). Phase 2 was a validation step, where paramedics participated in personal and focus group interviews to discuss workforce trends and aspects of health and wellness pertaining the mental health. Similarly, phase 3 was also a validation step, where a small sample of paramedics completed physical fitness appraisals. Phases 2 and 3 generated “deep dive” data on a small subset of paramedics to verify, confirm and expand on data obtained in Phase 1.

### 2.1 Phase 1 – Canadian paramedic health and wellness survey

Development and administration of the CPHWS was foundational to the success of this project. The methodologies and tactics employed to develop (2.1.1) and administer (2.2.2) the CPHWS are described below:

#### 2.1.1 Development of the CPHWS

The purpose of the CPHWS was to gather information from paramedics across Canada regarding their sociodemographic characteristics, workforce trends and health and wellness. To achieve this purpose, the CPHWS was developed as a series of items (open and close-ended questions) prompting paramedics to provide the information of interest. Items were selected in three ways. First, relevant sociodemographic and workforce trend related items were identified and extracted from previous paramedic related surveys (the *Ontario Paramedic Health and Injury Study*: MacPhee, 2014; and the *LEADS* study: Brown et al., 2002). Second, the research team searched for brief, validated survey instruments that could be embedded within the CPHWS to benchmark aspects of health and wellness. Selected survey instruments included the Short Form 36 (SF-36) (Ware & Sherbourne, 1992); Holmes and Rahe Stress Scale (Holmes & Rahe, 1967); and the Depression, Anxiety Stress Scales (DASS) (Lovibond & Lovibond, 1995). Lastly, additional items were crafted and added as necessary based on feedback and insight from the project advisory committee.

The CPHWS was then translated and adapted for paramedics in Canada. Following recommendations offered by the World Health Organization (“Process of translation and adaption of instruments”), the CPHWS was forward translated, reviewed, back translated, and pre-tested using cognitive interviewing techniques. As recommended, forward translation was performed by a translator knowledgeable of Canadian English speaking culture, but with Canadian French as her mother tongue. Following forward translation, an expert panel (including bilingual co-author R. MacPhee) reviewed the translation to identify and resolve discrepancies in the expressions / concepts within the translated version. The CPHWS was back translated by a second translator, knowledgeable of Canadian French speaking culture, but with Canadian English as her mother tongue, to further verify cultural and conceptual, not linguistic equivalence of each item. Cognitive

interviewing was conducted with a sample of 15 frontline paramedics (a mix of French and English speaking). Each paramedic was asked to read through and answer each item. Paramedics were then interviewed to identify any items that were unclear, or where linguistic inconsistencies occurred. The final version of the CPHWS resulted from the integration and consideration of all revisions and modifications emerging from this process.

The paper copy of the survey was also adapted to support online administration. With the support of the University of Waterloo's Survey Research Centre (SRC), all items were programmed and coded into the SRCs Voxco CAWI software (Voxco, Montreal QC) in French and English. The online version was tested to verify programmed skip patterns and reviewed to ensure all items were correctly programmed from a linguistic point-of-view.

### **2.1.2 Administration of the CPHWS**

The Tailored Design Method (TDM) (Dillman, 2011) informed the approach for paper and online administration of the CPHWS. The overarching goals informed by TDM were to minimize the costs to participation, provide adequate incentives and to establish trust. Meeting these objectives served to reduce potential error associated with sampling, coverage and non-response.

Establishing trust was considered as a critical goal. Through past experience with the *Ontario Paramedic Health and Injury Survey* (MacPhee, 2012), paramedics prefer to answer honestly and accurately when the survey is anonymous. Given the importance of anonymity, the paper and online CPHWS did not require paramedics to provide any personal information that would allow their identity, service, or province to be identified. Additionally, it was critical to establish partnership, via the advisory committee, with PCC, PAC, CUPE, and DRDC CSS where logos of each partner were included on the survey to demonstrate the importance and relevance of this work for all stakeholders within the paramedic community. We believe these foundational relationships not only helped to develop a relevant survey instrument, but also to increase the level of trust by demonstrating the commitment of partner organizations to this important work.

Paramedics, as the results show, often work 12-hour rotating shifts making it challenging to devote a 30-60 minute bout of time to completing a survey. To encourage paramedics to complete the survey on their available time the online survey was developed to allow respondents to save progress, where users were provided with a unique (anonymous) login in allowing them to return to the survey when they had time. In addition, the CPHWS consisted of simple to read, primarily closed-ended questions presented on clear webpages with appropriate skip patterns permitting respondents to easily click through the survey. These tactics were employed, consistent with the TDM method, to help minimize paramedic's perceived cost of participation.

Incentives were provided to encourage participation in the CPHWS. Paramedics were invited to complete a prize draw registration card (paper copies) or online form supplying their name and e-mail to enter into prize draws. An early-bird prize draw was held at the mid-way point of the survey period and included the opportunity to win an Apple iPad, or one of two Apple WATCH's. A final prize draw was held at the completion of the survey period where respondents could win one of two Apple iPod's, an Apple WATCH, or one of 50-\$25 pre-paid credit cards. The combination of a small number of high value prizes with many lower valued prizes were offered to maximize incentives to those looking to win a big prize, and to those who might be considering the probability of winning any prize.

Planning the survey logistics (i.e., getting surveys into the hands of paramedics and then returned to the research team) was an important step to mitigate error due to sampling, coverage and non-response rate. A foundational step required the establishment of a registry of paramedic services across Canada. Using that registry, the research team contacted each service to estimate the number of paramedics within each, summing together to estimate the total number of paramedics working in Canada. Using this information the research team estimated that approximately 38,000 paramedics were currently employed in Canada. Therefore a minimum sample of 2,266 respondents was required for a margin of error (confidence interval) of 2% in averaged estimates for each item, 19 times out of 20 (confidence level of 95%).

Survey rollout followed a carefully developed plan vetted and approved by the project advisory committee. Informed by TDM (Dillman, 2011) a CPHWS awareness campaign was launched in Q1 2016 to promote the upcoming survey. Communications were prepared and circulated in trade journals (*EMS Matters*, *Canadian Paramedicine*) and were circulated via mailing lists (PCC, PAC, CUPE) as appropriate. A standing frequently asked questions (FAQ) webpage was developed, where each communication directed interested readers to the FAQ page to learn more. In Q2 2016, the survey was launched. A snowballing approach was implemented for recruitment. Packages containing a letter introducing the survey, the paper survey and a pre-paid return envelope were mailed to numerous paramedic and emergency medical responder work locations across Canada by the research team (paper copies were sent to services supporting rural areas, and to randomly selected services). The letter included a link to an online open web survey hosted by the SRC for respondents who wished to complete the survey online. Respondents who completed the paper survey returned it to the researcher using a pre-paid return envelope. The open survey link was also provided in other communication vehicles such as mailing lists (PCC, PAC, CUPE, Ontario Paramedic Association, Canadian EMS Research Network), and posted on stakeholder websites (e.g., PAC).

### **2.1.3 Data analysis**

The purpose of this project was to describe the sociodemographics, workforce profile and health and wellness of paramedics in Canada. To address this purpose descriptive statistics were used to analyze the data (i.e., mean, standard deviation, frequencies). With reference to data obtained from the embedded, previously validated instruments, appropriate inferential statistics (e.g., T-test) were applied to compare paramedics' responses to available normative data. Descriptive statistics were calculated using Excel (Microsoft, Redmond, Washington). Inferential statistics were calculated using IBM SPSS Statistics 24 (IBM, Armonk, New York).

## **2.2 Phase 2 – Validating and probing aspects of paramedics' mental health and wellness**

In-person focus group / interviews were conducted with paramedics in Nova Scotia, Ontario, Alberta, and British Columbia in Q4 2016. Initially the intent was only to conduct focus group interviews; however, in an effort to allow for maximum flexibility with respect to the paramedics' personal and work schedules, the decision was made to also include the opportunity to participate

in a personal interview. Consequently, in all of the locations both personal and focus group interviews were conducted.

### **2.2.1 Recruitment**

In order to recruit participants for this cross-validation study, two recruitment strategies were utilized. For the first strategy, an e-mail invitation was developed and was forwarded to the Director, Chief, or Manager of each paramedic service within the geographical area of interest, with a request that the invitation be distributed through his/her respective service-wide internal email systems. Prospective participants were asked to contact the research team directly if they were interested in participating in the focus groups / interviews. For the second strategy, individuals who had self-identified their interest to participate in an interview during the completion of the CPHWS were contacted directly by the study's co-investigator (R. MacPhee). The email addresses used to contact the individuals were ones that they had voluntarily provided to the research team.

Upon developing a list of prospective participants, each participant was contacted and provided with the date, time, and location of the focus group / personal interview. In order to ensure confidentiality, each interview (regardless of type) was held at a location other than the paramedic service (i.e., typically a meeting room at a local hotel). The scheduling of the interviews was such that there was a minimum of two (2) hours between the end of one interview and the start of another. Participants only participated in one (1) type of interview.

### **2.2.2 Consent**

Each participant was provided with two consent forms; one was given to the participant for his/her record keeping, and the other was signed and returned to the research team. At the start of each interview session, a member of the research team addressed any questions the participants had regarding the interview process, length of the interview, remuneration, and general questions about the study on the whole. Participants were reminded that their participation was voluntary and that they could withdraw at any time before or during the interview. They were also instructed that should they choose to do so after the completion of the study, they could request their transcript data not be used in the analysis. All participants were reminded at the start of the interview that what transpired during the interview was to remain confidential and that information conveyed during the interview was not to be discussed outside of the interview room.

### **2.2.3 Data analysis**

Using phenomenology as the theoretical orientation, a series of questions and related probes were presented to the participants during the interview. Participants were encouraged to contribute throughout the interview; however, it was made clear at the start of the interview that they were not required to answer any question(s) or related probe(s) if they choose not to. Dr. MacPhee acted as the moderator during all of the personal and focus group interviews. A Research Assistant (RA) was responsible for taking field notes, time keeping, and clarification of information provided (as needed).

All interviews were audiotaped and transcribed verbatim. Each participant was assigned a code (e.g., EMS1, EMS2) that was used to identify him/her within the transcribed reports. No actual participant names appeared on any transcribed reports or in any quotes. Where participants recounted personal example(s) of their experiences, any reference to other individuals (e.g., names, dates, times and locations) was replaced in the transcripts with “XX”.

After the audiotapes were transcribed verbatim, participants were provided with the opportunity to review the transcript from their focus group / his/her personal interview (aka member check) so that they could provide comment(s) on the content of the interviews. This allowed the participants an opportunity to confirm either that the transcripts reflected their views, feelings, and experiences, or that they did not reflect these experiences. After the member checks were completed, each interview was analyzed by Dr. MacPhee and a second-reader using the constant comparative method.

## **2.3 Phase 3 – Validating and probing aspects of paramedics’ physical health and wellness**

One-on-one physical fitness appraisals were conducted with paramedics in Nova Scotia, Ontario and Alberta in Q4 2016. To minimize costs, physical fitness appraisals were held concurrently with the focus group / interview phase. Recruitment and consent were similar to the processes describe in section 2.2.1 and 2.2.2).

### **2.3.1 Physical fitness appraisal battery**

The physical fitness test battery included measures of: (i) musculoskeletal fitness based on the CSEP-PATH approach (CSEP, 2013), including: grip strength; a push-up test; a vertical jump test; a back extensor test; and, a one-leg stance test; and (ii) bimanual dexterity and coordination (Tiffen & Asher, 1948).

CSEP-PATH musculoskeletal fitness assessment: Five assessment tests were extracted from the CSEP-PATH musculoskeletal fitness assessment including: grip strength; push-up; vertical jump; back extension; and, one leg stance. Each test was administered according to CSEP-PATH instructions. Briefly summarized, grip strength was evaluated bilaterally using a JAMAR grip strength dynamometer (Jamar®, Patterson Medical, Mississauga, ON). Participants were tested in a standing position, where the arm was extended down beside the body and the grip was adjusted to the hand size of each participant. The peak force generated through three repeats was recorded. The push-up test required participants to complete as many push-ups as possible until volitional fatigue, where push-ups performed with improper technique were not counted. The vertical jump component required participants to jump vertically, starting in a counter movement position without arm involvement (no swinging of the arms prior to takeoff), reaching as high as possible. Participants were provided with three trials, where 10-15 seconds of rest was provided between each trial. The peak height resulting from the three repeats was recorded and combined with body weight to estimate peak lower body power. Back extension endurance was measured using the Biering-Sorensen extension test where endurance time was measured until volitional fatigue, or until the torso fell below the horizontal (allowing for one warning). Lastly, the one-leg stance test was conducted unilaterally for each leg, once with eyes open and once with eyes closed. The test required participants to hold their arms across their chest, lifting one leg up off the ground.

Participants were asked to maintain this position for 45 seconds where their maximum time was recorded if they did not reach the required duration.

Bi-manual dexterity: The Purdue Pegboard test was used to measure manual dexterity. Pegboard tests required participants to place cylindrical metal pins in holes positioned on a board with two parallel rows. Participants performed 30-second tests unilaterally with each hand, bilaterally, and also completed an assembly task. The number of correctly placed pins, and assemblies in 30 seconds, was recorded.

### **2.3.2 Data analysis**

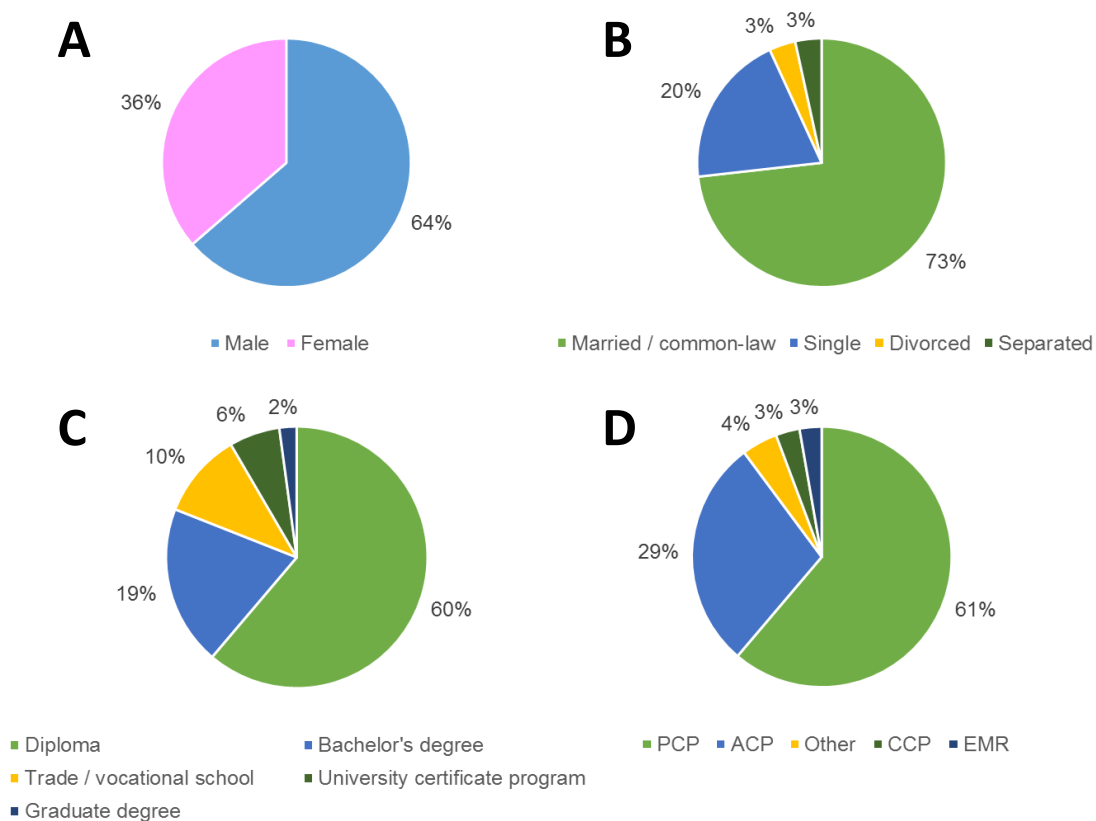
Physical fitness appraisal data was analyzed in two ways. First descriptive statistics (i.e., mean, standard deviation) were calculated to characterize paramedics' physical fitness. Second, inferential statistics were applied, where appropriate, to compare the physical fitness outcomes measured from Canadian paramedics relative to normative data (where available). Descriptive statistics were calculated using Excel (Microsoft, Redmon, Washington). Inferential statistics were calculated using IBM SPSS Statistics 24 (IBM, Armonk, New York).

## 3 Results

The results characterize the socio-demographics, workforce profile and health and wellness of Canadian paramedics. Descriptive statistics (and inferential statistics where appropriate) are summarized below. Data reported for the sections pertaining to sociodemographics and workplace profiles was obtained directly from the survey. With respect to the sections pertaining to mental and physical health the data were obtained from the CPHWS and from the validation processes in Phases 2 and 3.

### 3.1 Sociodemographics

The CPHWS examined five socio-demographic characteristics including: age, gender, marital status, level of education, and certification level. The median age of paramedic respondents was 37 years with a range of 20-69 years. Figure 1 illustrates response frequencies regarding gender (A), marital status (B), level of education (C), and certification level (D). The majority of respondents (94%) are currently employed at the paramedic skill level for which they have been certified.



*Figure 1: Sociodemographic characteristics of respondents to the CPHWS including gender (A), marital status (B), highest level of education (C) and highest level of certification (D). Note: PCP, Primary Care Paramedic; ACP, Advanced Care Paramedic; CCP, Critical Care Paramedics; EMR, Emergency Medical Responder.*

## 3.2 Workforce profile

The workforce profile is presented in two sub-sections: employment status / work requirements and workforce trends. The employment status section of the CPHWS probed aspects of employment including hours worked, shift length, overtime requirements, etc. Workforce trends probed the frequency of past and expected future leaves, including prospective retirements.

### 3.2.1 Employment status / work requirements

The CPHWS probed years of experience, and current employment status. Figure 2 illustrates response frequencies regarding years experience (A), the number of paramedics currently employed by more than one service (B), and the employment status (C).

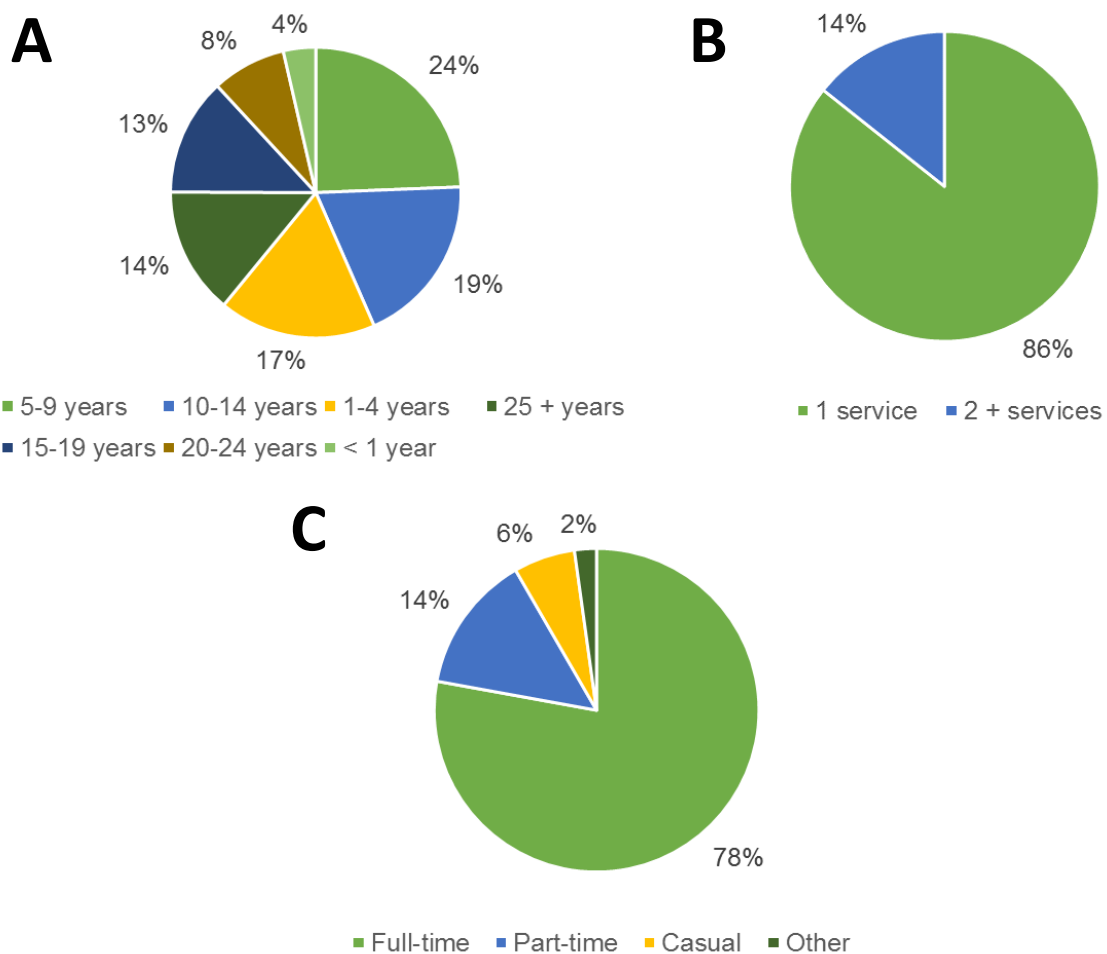
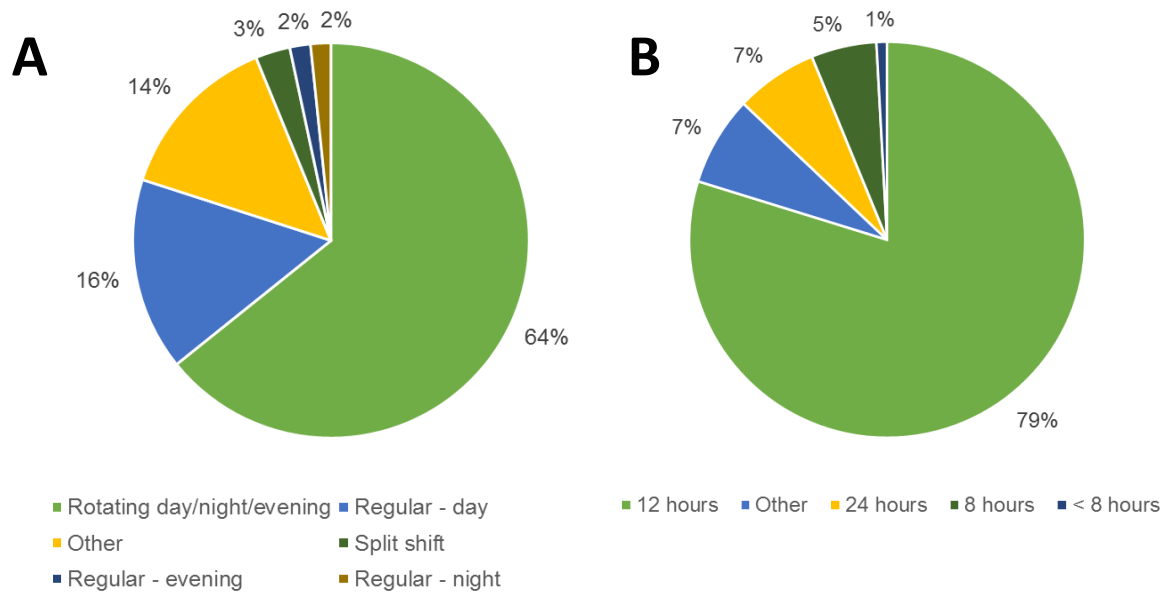


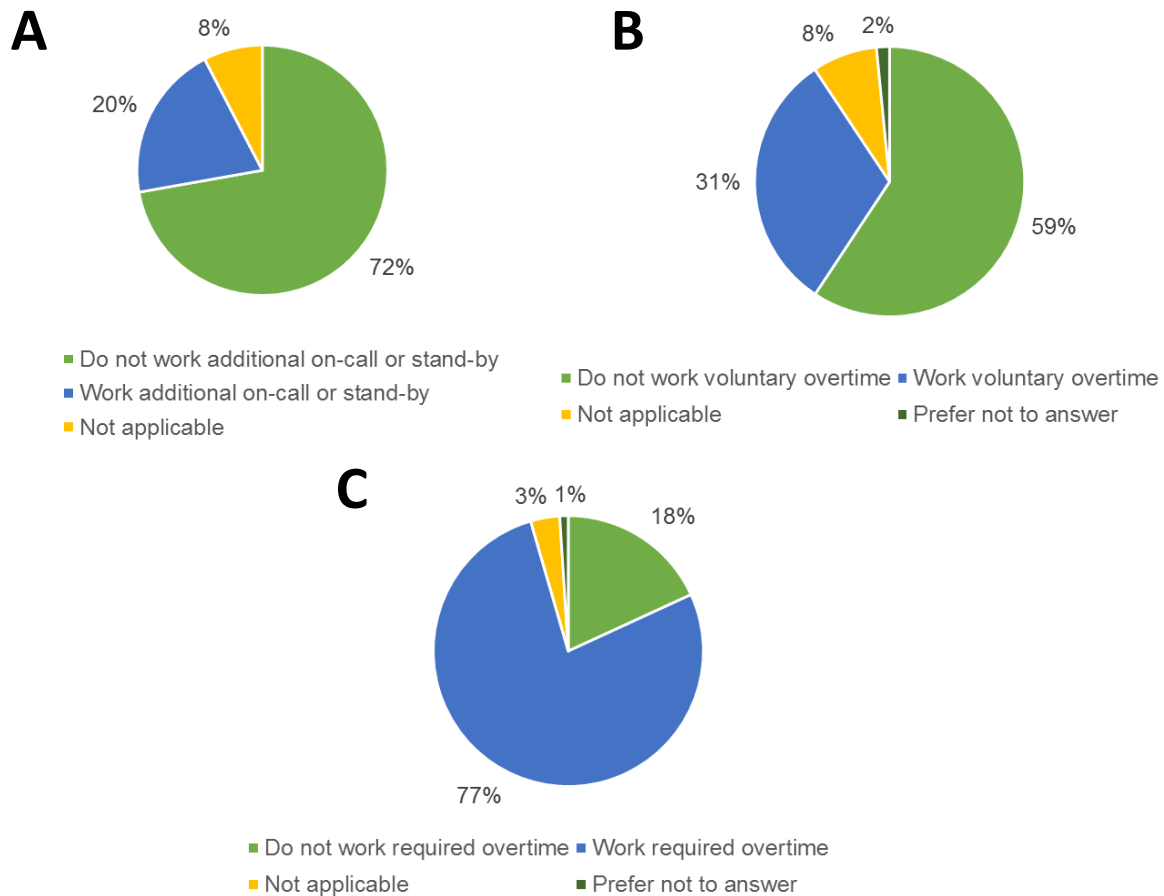
Figure 2: Employment status of respondents to the CPHWS including years experience (A), the number of paramedics currently employed by more than one service (B), and the employment status (C).

The type of shift, length of shift and hours worked (regular and overtime) were also probed in the CPHWS. Figure 3 illustrates response frequencies regarding the type of shift (A) and the typical shift length (B).



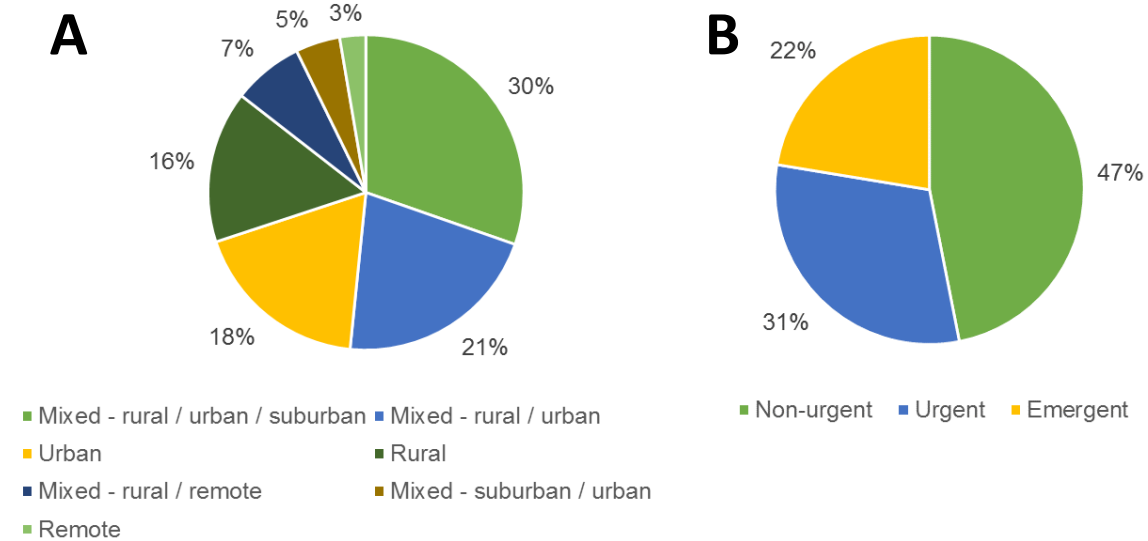
*Figure 3: Work structure of respondents to the CPHWS including the type of shift (A) and the typical shift length (B).*

During a traditional two-week pay period, respondents indicated that the mean ( $\pm$  standard deviation) minimum number of regularly scheduled hours worked was 62.8 ( $\pm$ 32.6) hours (median of 72 hours), and the maximum number of regularly scheduled hours worked was 80 ( $\pm$ 35.4) hours (median of 84 hours). Figure 4 illustrates response frequencies regarding the number of paramedics that work additional hours on-call or on stand-by (A), by engaging in voluntary overtime (B), and by working required overtime (i.e., shift overrun) (C).



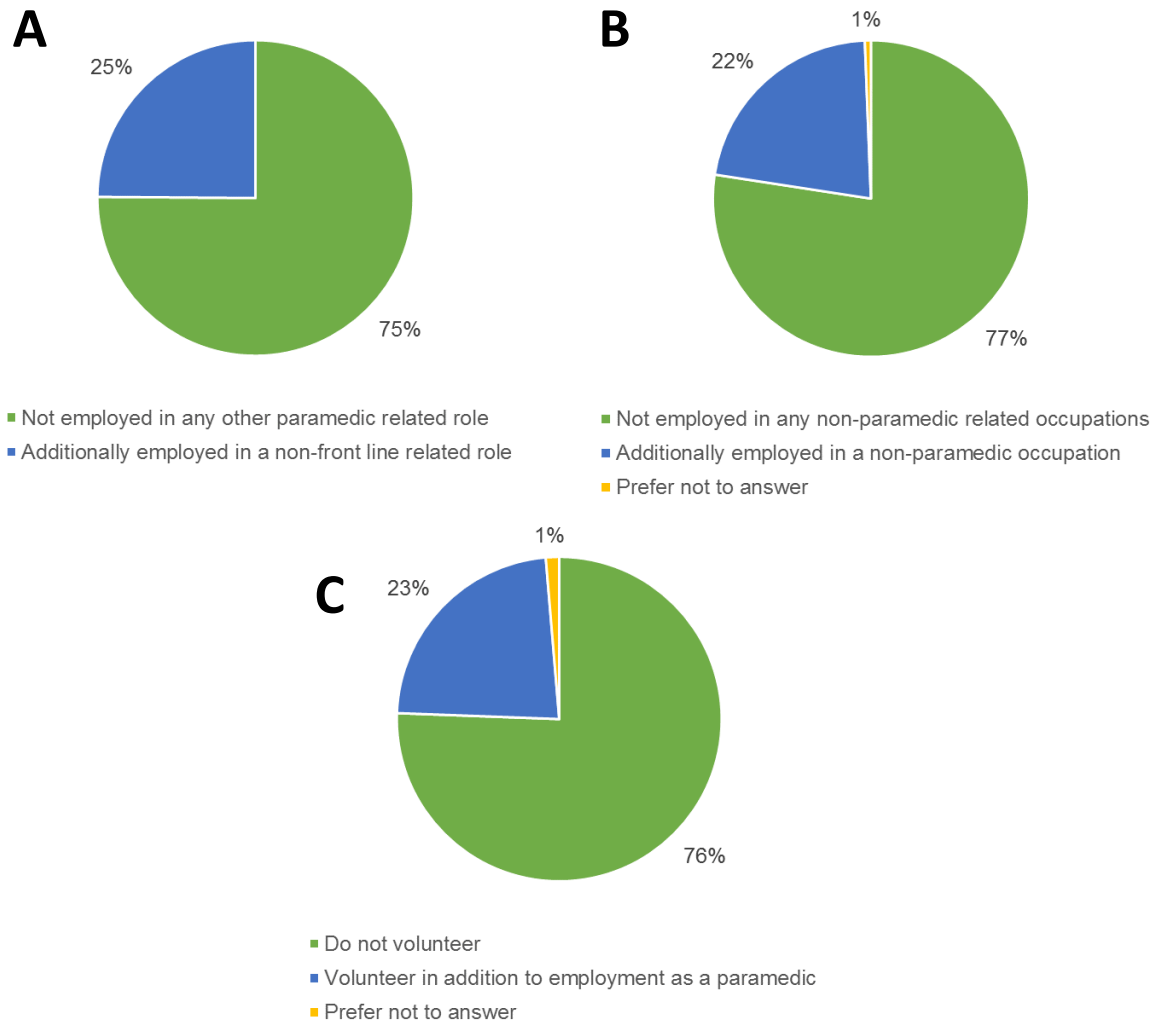
*Figure 4: Characteristics of additional working time of respondents to the CPHWS including the percentage working additional on-call or stand-by (A), voluntary overtime (B), and required overtime (i.e., shift overrun) (C).*

Paramedics typically attend to calls within the paramedic services' designated catchment area (Figure 5A). During a shift, paramedics transported a mean of 4.0 ( $\pm 3.0$ ) patients per shift (median of 4 patients), where Figure 5B illustrates the proportion of calls that respondent deemed as emergent, urgent and non-urgent.



*Figure 5: Coverage area (A) and proportion of calls by acuity level (B) described by respondents to the CPHWS.*

In addition to their primary role as a paramedic, respondents indicated that they might also work in other paramedic-related roles. Figure 6 illustrates response frequencies regarding the proportion of paramedics that are also employed in other non-frontline paramedic related roles (e.g., Base Hospital, Paramedic Community College Instructor, Ministry of Health Service Reviewer, Paramedic Union Representative, Special Events Medical Attendant, etc.) (A), employed in other non-paramedic related occupations (B), and, volunteer with local organizations (C).



*Figure 6: Additional employment and volunteer roles of respondents to the CPHWS including the non-frontline paramedic related roles (A), non-paramedic related employment (B), and volunteer commitments (C).*

### 3.2.2 Workforce trends

Paramedics were asked to describe any leaves taken in the previous two years, anticipated leaves within the next two years, and any plans for a career change or retirement. Within the two years prior to the CPHWS, 53% of paramedics took a leave. Figure 7A illustrates the proportion of paramedics taking a leave for reasons including medical, mental health, maternity, parental compassionate care, or for other reasons. Within the next two years, nearly 30% of respondents plan to take a leave. Figure 7B illustrates the proportion of paramedics taking a leave for reasons including medical, maternity, parental compassionate care, or for other reasons.

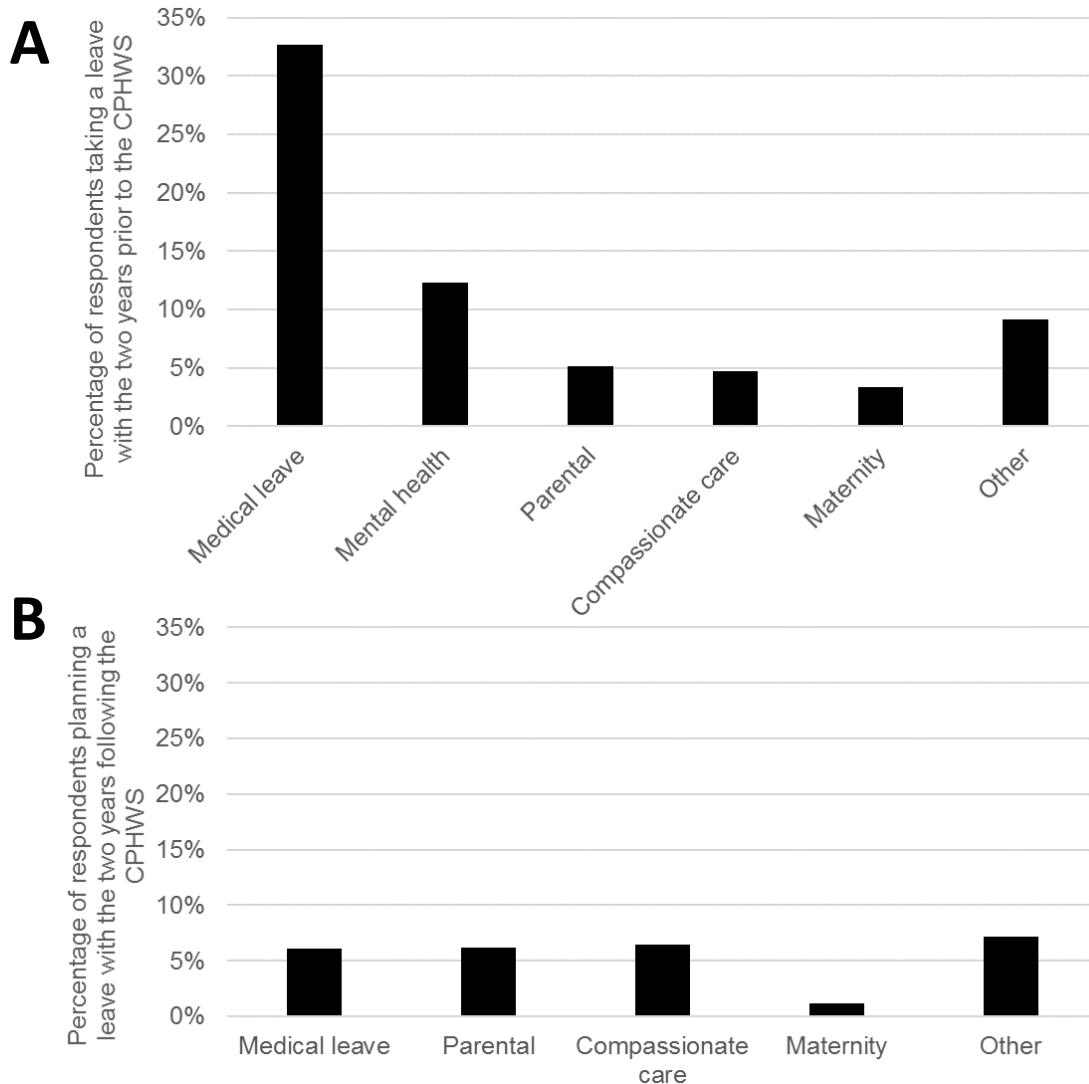
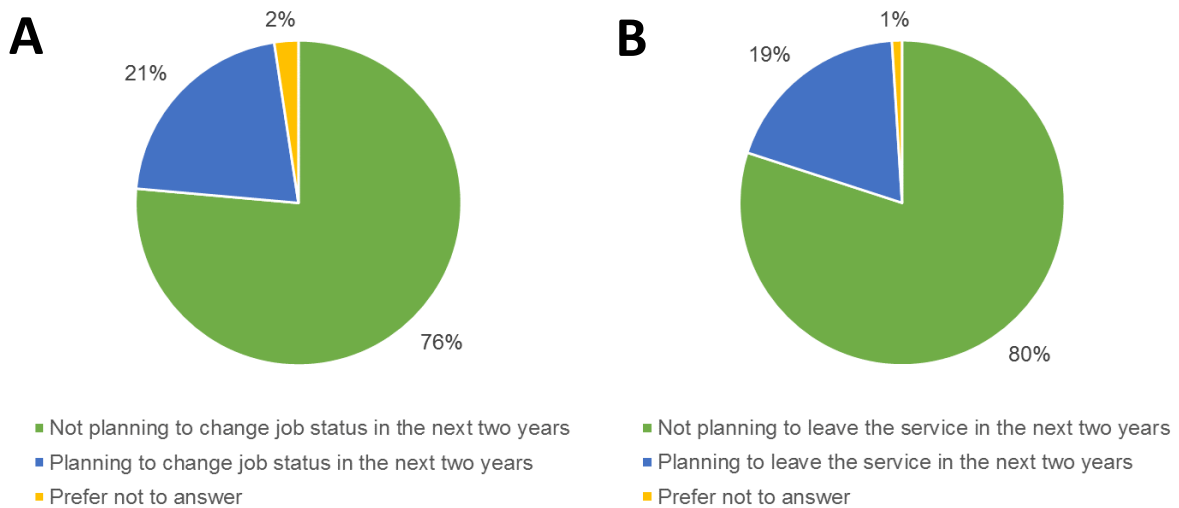


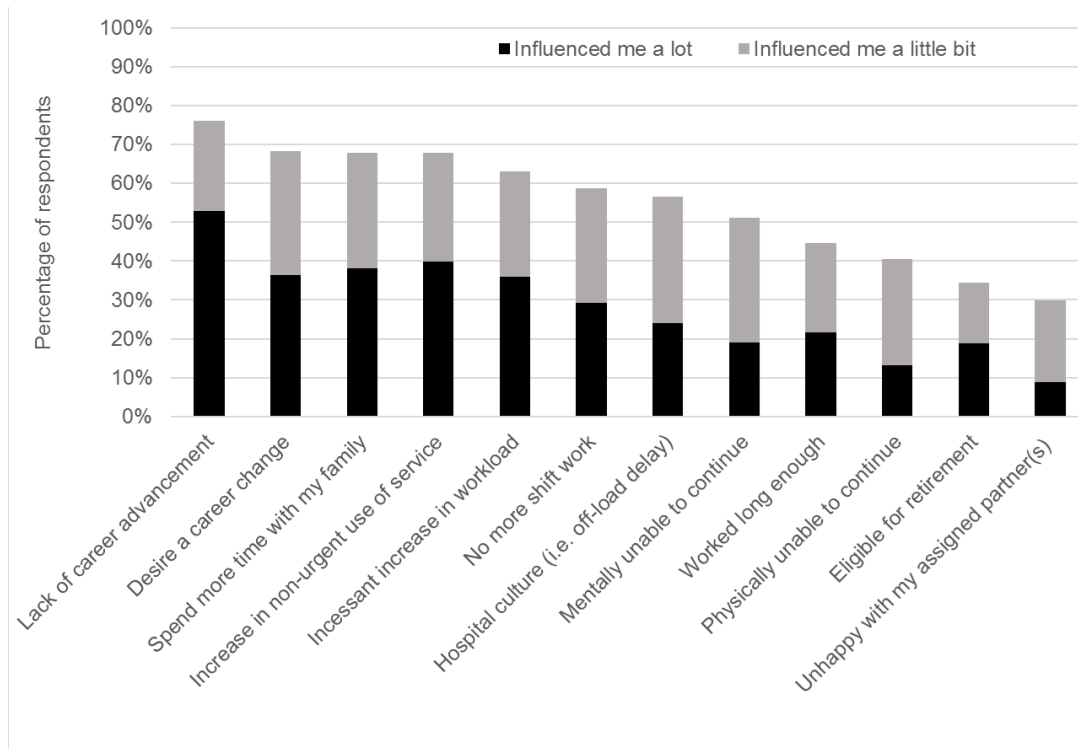
Figure 7: The number of respondents (%) who have taken leave in the two years prior (A) or plan to take a leave within the two years following (B) the CPHWS.

Respondents were asked to comment on their likelihood of changing their job status (e.g., full-time to part-time) or leaving the service (profession). Figure 8 illustrates response frequencies regarding desire to change job status (A), and desire to leave the service (B).



*Figure 8: Desire for a change in job status (A) and desire to leave the service (B) from respondents to the CPHWS.*

When paramedics indicated a desire to leave the service (profession), they were provided with a list of possible reasons that may have influenced their decision. Figure 9 illustrates which factors were most influential in deciding to leave the service in the next two years.



*Figure 9: Factors influencing the decisions of respondents planning to leave the service within the next two years.*

### 3.3 Mental health and wellness

The CPHWS sought to determine paramedics' level of mental health and wellness by embedding the Depression, Anxiety, Stress Scales (DASS) (3.3.1) and the Holmes & Rahe Stress Scale (3.3.2) within the survey. In addition, through the use of structured focus group and personal interviews, the research team was able to delve further into this area during Phase 2 of the study (see 3.3.3).

#### 3.3.1 Depression, Anxiety, Stress Scales (DASS)

The DASS is a set of three self-report scales designed to measure emotional states of depression, anxiety and stress. Figure 10 illustrates respondents' scores regarding depression (A), anxiety (B) and stress (C).

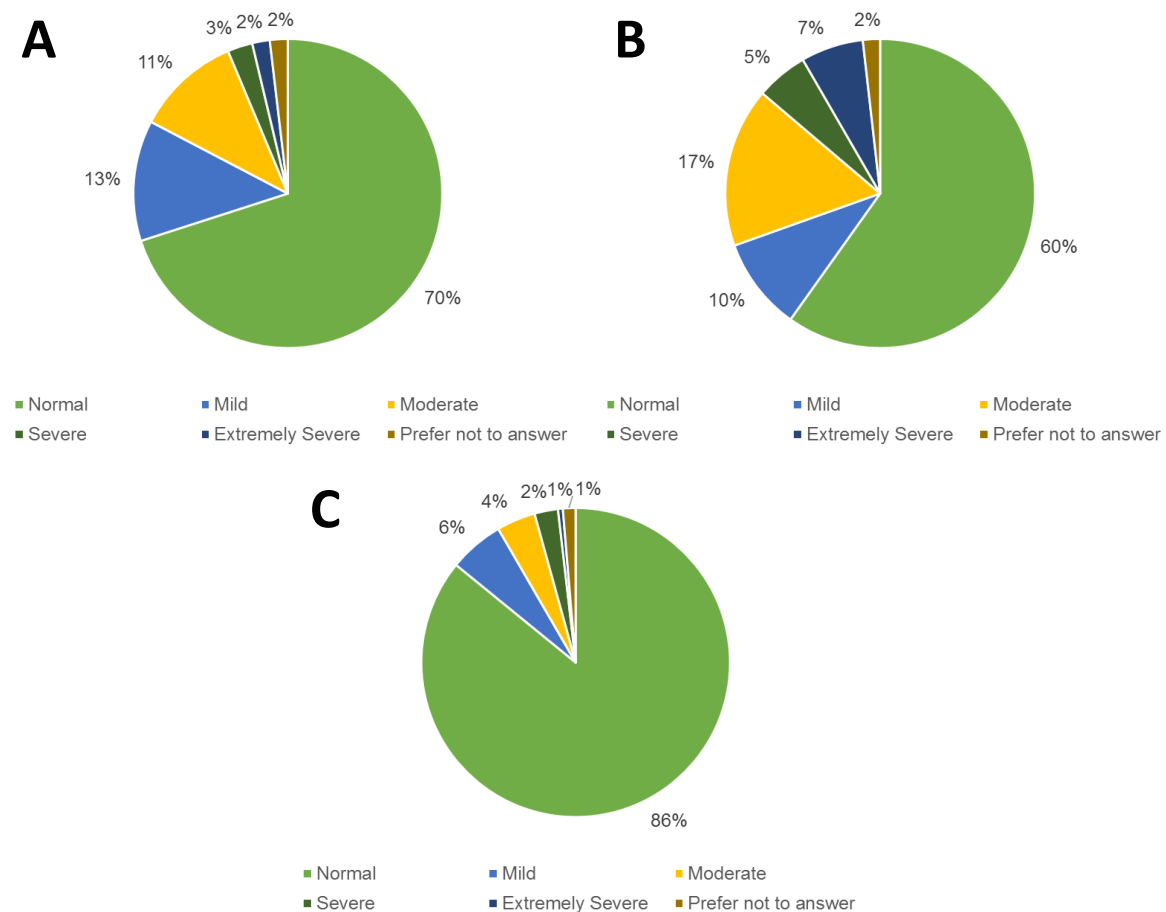
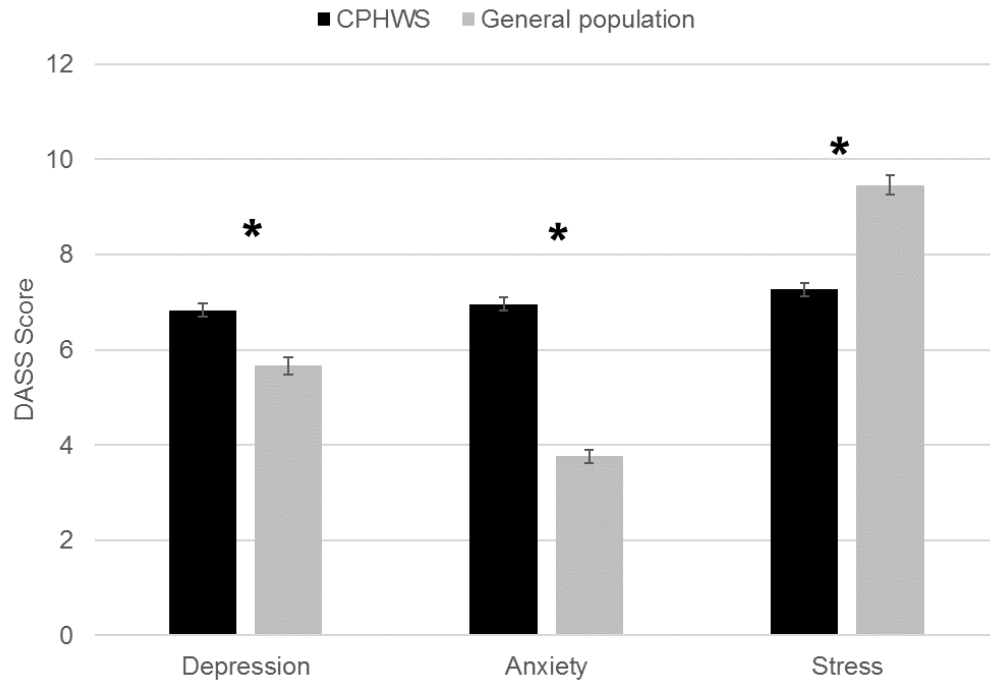


Figure 10: Depression (A), Anxiety (B), Stress (C) scale scores from respondents to the CPHWS.

Although normative data for DASS scores does not exist within the Canadian population, Henry and Crawford (2005) provide normative data from a large, non-clinical cross-sectional sample of the general adult UK population. Using inferential statistics (T-tests) means were compared between the CPHWS and the normative general population data (Henry & Crawford, 2005). As illustrated in Figure 11, paramedic's scores were significantly higher than the general population on the Depression ( $t(4301)=5.21$ ,  $p<0.001$ ) and Anxiety scales ( $t(4303)=15.71$ ,  $p<0.001$ ), but significantly lower on the Stress scale ( $t(4315)=9.37$ ,  $p<0.001$ ).



*Figure 11: DASS scores ( $\pm$  standard error) obtained from paramedics responding to the CPHWS compared to normative data from the general population (Henry & Crawford, 2005). Asterisks' ('\*') indicate significant differences between groups.*

### 3.3.2 Holmes & Rahe Stress Scale

The Holmes and Rahe Stress Scale attempts to link exposure to stressful life events (e.g., divorce, death in the family, etc.) to the likelihood of developing an illness in the near future. Figure 12 illustrates the proportion of paramedics 30%, 50% and 80% likely to develop illness in the near term on account of exposures to significant life events over the previous year.

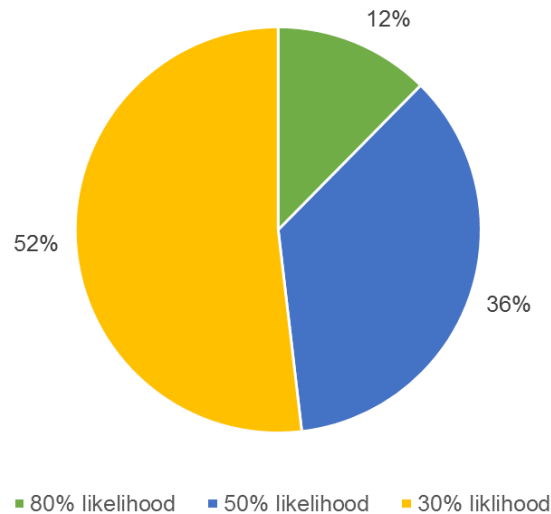


Figure 12: Holmes and Rahe Stress Scale score distribution based on paramedics' responses within the CPHWS.

### 3.3.3 Focus group / interview results

During Phase 2 of the study, a total of seven (7) focus group and ten (10) personal interviews were conducted in several location across the country.

Location	# of Focus Group Interviews	# of Personal Interviews
Nova Scotia	1 (3 participants)	3
Ontario	4 (10 participants in total)	2
Alberta	1 (3 participants)	2
British Columbia	1 (3 participants)	3
<b>TOTAL</b>	7 (19 participants)	10

With respect to level of certification, one Critical Care / Flight paramedic participated in the interview process, while the remaining paramedics were either Primary Care or Advanced Care. The years of service ranged from six (6) to 32 years. The majority of the paramedics were employed full-time. Eighteen (18) of the participants were male; the remaining 11 participants were female. The interviews ranged from 83 minutes to 192 minutes in length.

Using the constant comparative method for analysing the content of the interviews, each transcript was reviewed initially for broad, common, recurring themes and concepts. Recall that the purpose of the interviews was to delve into the issues identified within the survey with respect to mental health within the context of being a paramedic. Based on this initial review, recurring themes were grouped into broad categories. With subsequent more detailed readings, the themes and concepts were then sorted into specific categories. The contents of the transcript were reviewed to the point of saturation, wherein no further themes could be identified. The three major themes that emerged were: *Operational Factors*; *Organizational and Management / Leadership Factors*; and, *Barriers to Good Mental Health*.

### **Operational Factors**

Throughout the interviews, paramedics consistently and repeatedly identified ‘operational factors’ as contributing to poor mental health among the profession. Specifically, significant off-load delays, forced overtime, lack of time while on duty to attend to personal needs (i.e., washroom breaks, minimal / missed meals), lack of and/or poor communication between dispatchers and crews, and lack of staff resulting in denied requests for time off (i.e., vacation).

*“I can’t remember the last time we have been able to stop for 5 minutes so that we can pee. Forget about eating. I usually eat before I come in to work and then while I am driving home after my 12 hour day...assuming we don’t have overtime.” (PI002)*

*“Inadequate resources – like staffed ambulances – and management’s continued disinterest in addressing the inadequacy has taken a terrible mental and physical toll. Our suffocating call volume has only been ‘monitored’, to use management’s words. Meanwhile, my body is breaking down because there are no breaks or recovery time.” (FG001)*

*“Dispatch. Whatever. They get to sit in their comfy offices, in their comfy chairs, and they can eat because they get to take their breaks. They get on the radio and bark at us to hurry-up and finish our forms because there are a bunch of outstanding calls. They have no idea what it’s like to be on the road and they don’t care. They just care about getting our response times down.” (FG006)*

### **Organizational and Management / Leadership Factors**

While some paramedics noted management / leadership teams to be supportive and having positive attitudes towards the paramedics’ mental health, more often than not they were perceived with strong negativity. In analysing the transcripts, these differences were consistent within services as well as across services.

*“Not enough interaction with management in regards to our mental health. We have always taken care of each other in hard times because management doesn’t really care.” (FG008)*

*“We are not supported by our management team. When bad calls happen all other emergency services have the support of their superiors, but none of ours come. When asked to come, they ask why. There is very minimal positive feedback when we do things right and it makes it difficult to feel appreciated. We can’t win either way.” (F0011)*

*“My supervisor is pretty good, yeah. It is usually in a non-formal manner we don't usually do like any letter giving or awards or anything like that, but it's usually a pat on the back. He's pretty knowledgeable about our day to day about what we are up to so he'll usually follow-up with us.”* (FG012)

*“My bosses try to tell us that it's expensive when we go off – for whatever reason. To me, that message means keep working no matter what. It's all about the almighty dollar.”* (FG016)

*“What's the point of telling my supervisors I don't feel well or that I have had a shitty call – they're too busy to help us?”* (PI006).

*“I am amazed, still, at the lack of management support for paramedics. We are made to feel expendable by management and municipal government.”* (PI08)

*“XX (name of service) wanted to just turn a blind eye to Paramedics, I know they had to absorb us, but we are like the red-headed step child - just sit in the corner and don't bother us. So it slid and there was no formalized program, there was nothing, it took our co-worker killing himself in an ambulance in a station to get any sort of mobility from the employer.”* (PI009)

### **Barriers to Good Mental Health**

One of the most significant factors that either contributed to and/or exacerbated mental health challenges among paramedics was the lack of available, qualified mental health professionals (i.e., psychologists and psychiatrists) and more specifically, individuals who have been trained to understand the paramedic environment. Other sub-themes that emerged included: lack of EAP and peer support networks; insurance limitations (i.e., there is an upper limit of eight counselling sessions available to some paramedics); lack of services within the paramedics' community (i.e., need to travel to another location to access counselling services), and the lengthy, complicated, convoluted process required to submit / request / receive insured care.

*“I stopped going to counselling after three sessions – I couldn't stand going and trying to explain to XX what I did for a living because when I described it, she would just sit there and cry”.* (FG003).

*“Who am I supposed to call? I leave in rural XX – there is no one around here for miles.”* (FG010)

*“...18 months off with depression and then one year back on the road then 24 months off with depression. No help, no support from my employer or the insurance provider. Treatment by management at work caused increased anxiety and extended time away from the job. Paramedics across the country end their own lives due to no support or recognition that they are in trouble. Something needs to be done. Now.”* (FG014)

*“I finished my six sessions and was told I was ready to go back on the road. When I told XX (counsellor) I wanted to have some check-up sessions from time-to-time, she said that I would have to file a claim for more through the insurance company and it would be up to them to decide what I needed. I try to be proactive so that I don't end up dealing with more crap down the road*

*and this is the answer I get? Forget it. I'll figure things out on my own. Or maybe I won't."*  
(PI004)

Regardless of the setting of the interviews (i.e., geographical location) or the type of interview (focus group vs. personal), the specific themes that emerged were found to be consistent across the country. This raises the concern that the challenges that paramedics are facing with respect to mental health are not unique within certain provinces, but rather they are systemic across the entire country.

### **3.4 Physical health and wellness**

Paramedic's physical health and wellness was probed in the CPHWS using the Short Form 36 (SF-36) (3.4.1), custom items probing aspects relevant to general health and wellness (3.4.2), and custom items, including a body map to reveal the prevalence of pain, previous injury history and health-related conditions (3.4.3). Physical health and wellness was explored further through physical fitness appraisals conducted in Phase 3 (3.4.4).

#### **3.4.1 Short Form 36 (SF-36)**

The SF-36 is a self-report survey measuring the respondent's general quality of life related to health and wellness. Survey responses were analyzed revealing scores in eight areas: physical functioning, role limitations due to physical health, role limitations due to emotional health, energy/fatigue, emotional wellness, social functioning, pain, and general health and wellness. Figure 13 illustrates the mean scores in all eight categories based on data obtained in the CPHWS, where scores closer to 100 represent better health. Using inferential statistics (T-tests) means were compared between the CPHWS and normative data from the general Canadian population for those between the ages of 35-44 (Hopman et al., 2000) for added context. Paramedic's scores were significantly lower than the Canadian population on role limitations due to physical health ( $t(2969)=5.94, p<0.001; d=0.29$ ), role limitations due to emotional health ( $t(2677)=6.45, p<0.001; d=0.32$ ), energy/fatigue ( $t(3015)=13.86, p<0.001; d=0.68$ ), emotional wellness ( $t(3021)=8.27, p<0.001; d=0.40$ ), social functioning ( $t(3018)=8.47, p<0.001; d=0.42$ ), pain ( $t(3041)=6.39, p<0.001; d=0.31$ ), and general health and wellness ( $t(3040)=16.00, p<0.001; d=0.79$ ). On the basis of effect sizes, the greatest differences between paramedics and the Canadian population exist in the domains of energy / fatigue and general health. Paramedics scores did not differ from the Canadian population regarding the physical functioning dimension ( $t(3024)=0.07, p=0.51; d=0.03$ ).

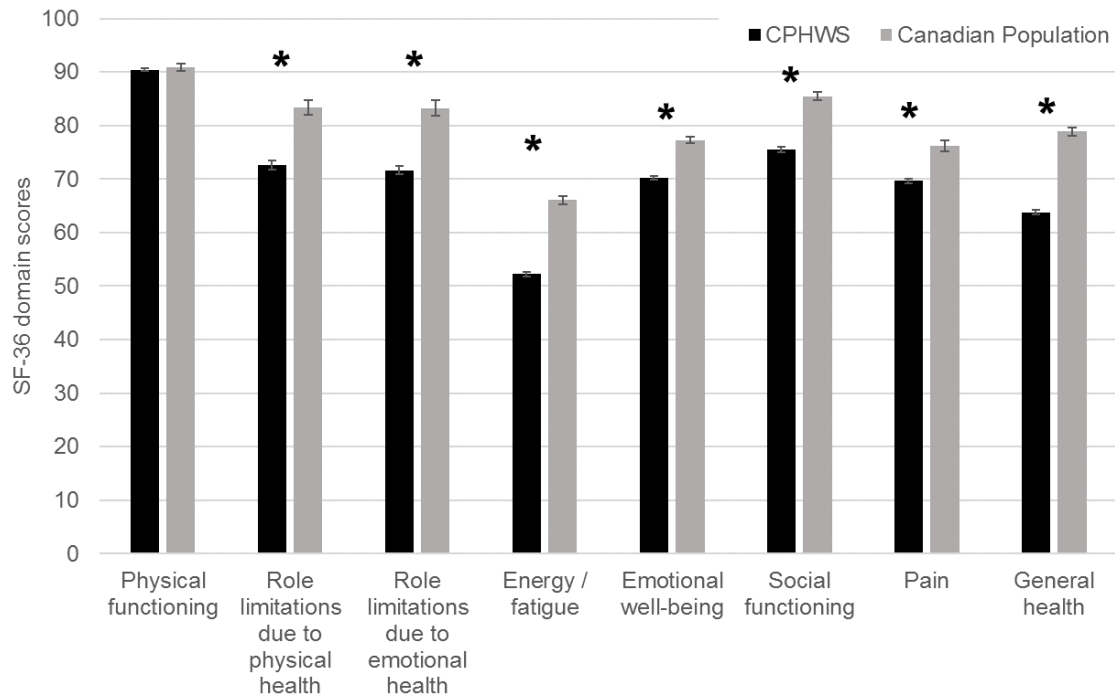
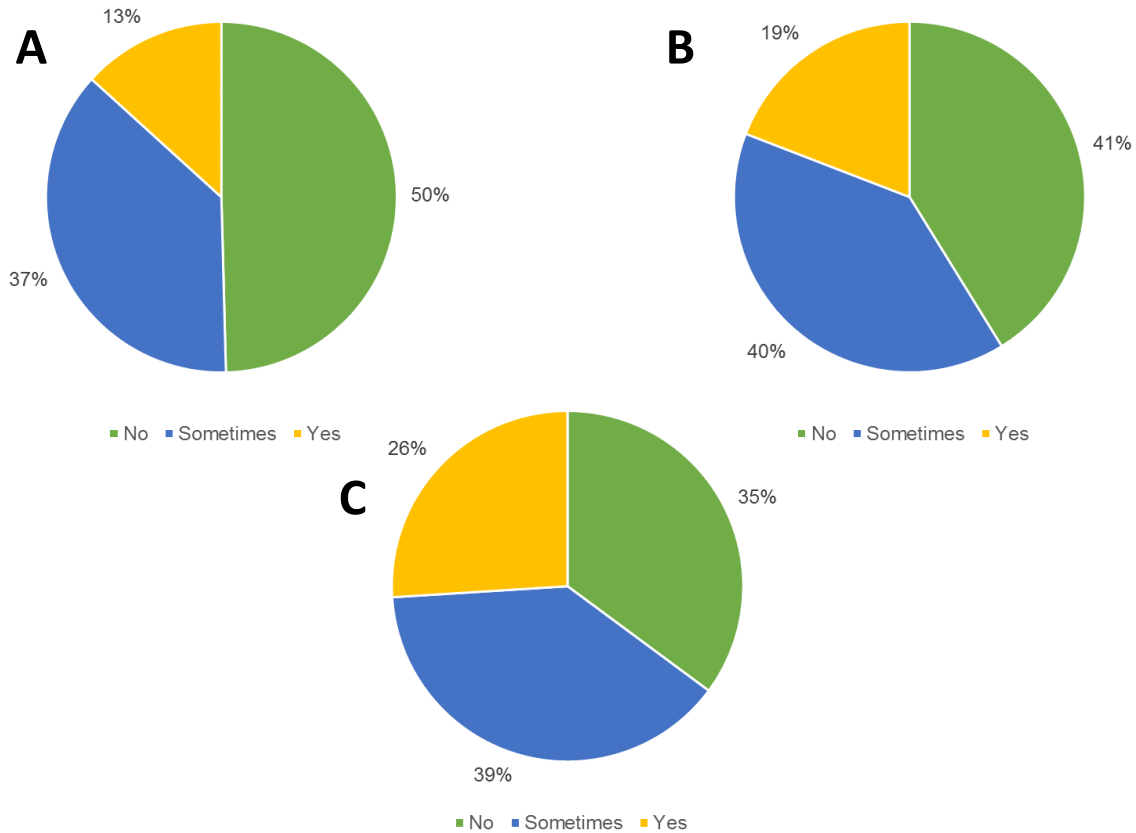


Figure 13: Short Form 36 (SF-36) scores ( $\pm$  standard error) obtained from paramedics responding to the CPHWS compared to normative data from the Canadian general population (Hopman et al., 2000). Asterisks' (\*) indicate significant differences between groups.

## General indicators of health and wellness

Paramedics were invited to respond to a series of custom items designed to probe issues including adherence to physical activity and nutrition guidelines, sleep habits and smoking / alcohol / controlled substance use. Figure 14 illustrates how many respondents follow the “Eating well with Canada’s Food guide” when working nights (A), days (B), and when not scheduled to work (C).



*Figure 14: The percentage of CPHWS respondents following the “Eating well with Canada’s Food guide” when working nights (A), days (B), and when not scheduled to work (C).*

The Canadian Physical Activity Guidelines (Tremblay et al., 2011) recommend 150 minutes of physical activity per week, where sessions of moderate-to-vigorous activity last at least 10 minutes in duration, and where activities that build muscle and bone density are performed at least two days per week. Figure 15 illustrates how many respondents meet the “150 minutes of activity requirement per week” when working nights (A), days (B), and when not scheduled to work (C).

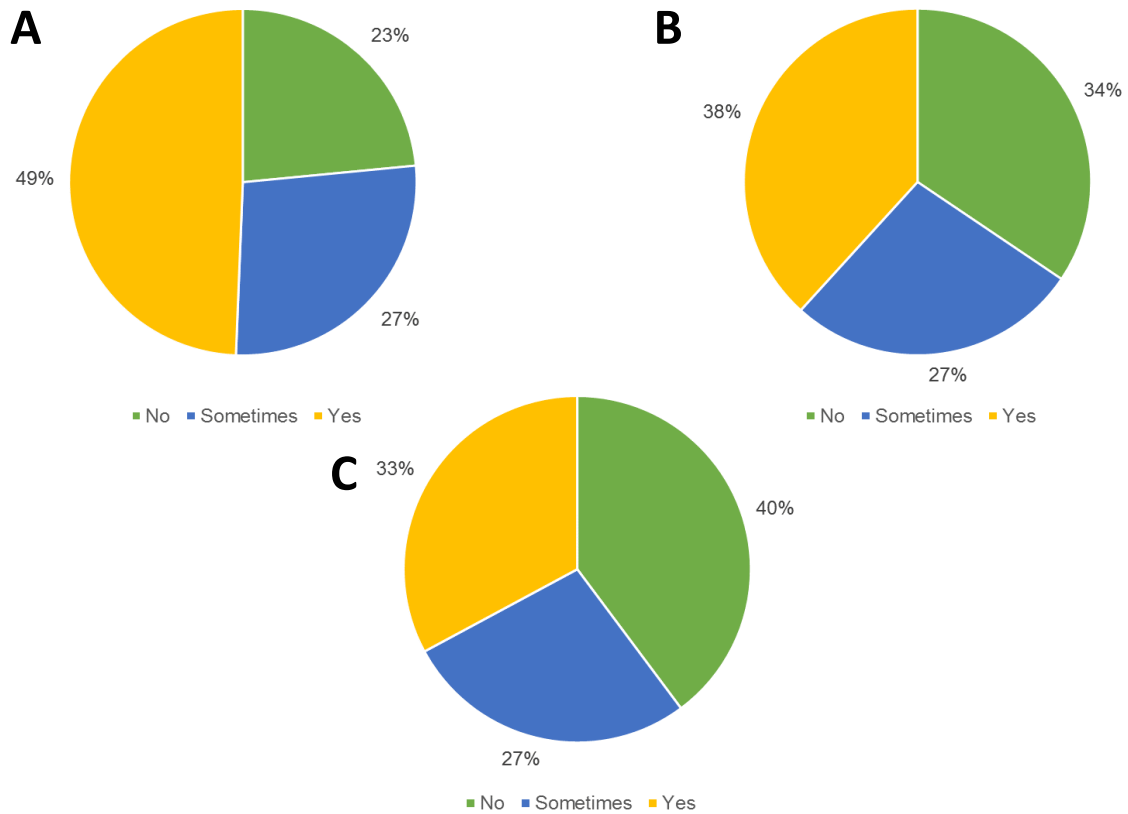


Figure 15: The percentage of CPHWS respondents who meet the “150 minutes of activity requirement per week” when working nights (A), days (B), and when not scheduled to work (C).

Figure 16 illustrates how many respondents meet the “sessions of moderate-to-vigorous activity lasting at least 10 minutes in duration” when working nights (A), days (B), and when not scheduled to work (C).

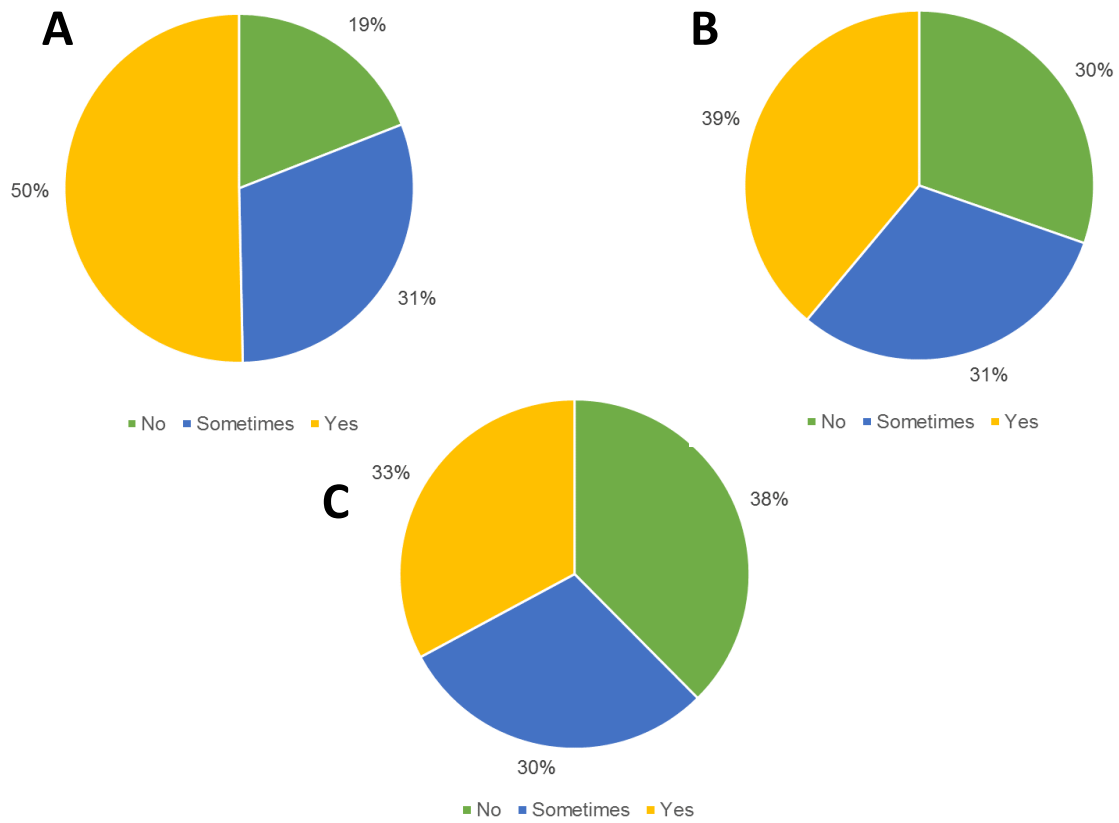


Figure 16: The percentage of CPHWS respondents who meet the “sessions of moderate-to-vigorous activity lasting at least 10 minutes in duration” when working nights (A), days (B), and when not scheduled to work (C).

Figure 17 illustrates how many respondents meet the “perform activities that build muscle and bone density are performed at least two days per week” when working nights (A), days (B), and when not scheduled to work (C).

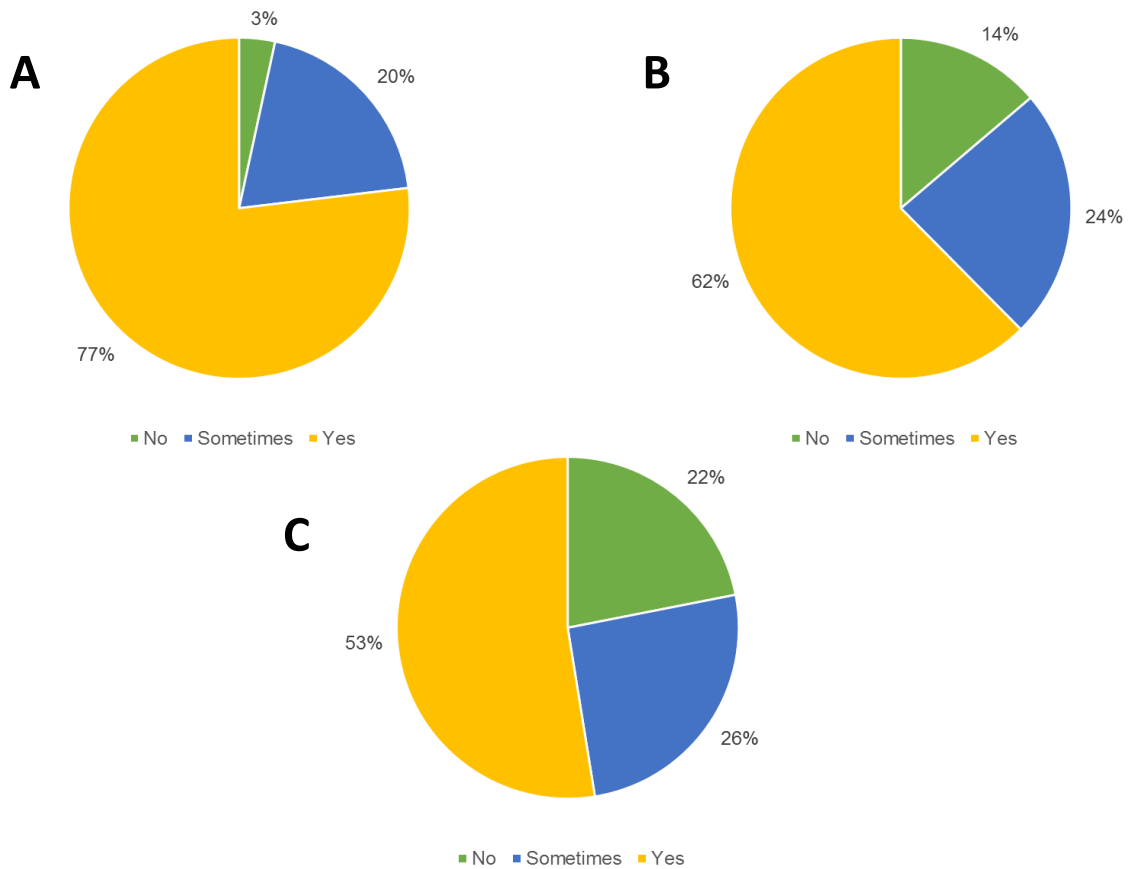


Figure 17: The percentage of CPHWS respondents who meet the “perform activities that build muscle and bone density are performed at least two days per week” when working nights (A), days (B), and when not scheduled to work (C).

Sleep habits may be an important determinant of paramedics' health and wellness. CPHWS respondents were asked to describe their sleep habits by estimating the average duration of sleep per day, likelihood of feeling rested enough to report for duty, frequency of trouble going to or staying asleep, frequency of sleep aid use, likelihood of getting a sufficient amount of sleep, likelihood of waking up unexpectedly, and frequency of difficulties staying awake. Figure 18 illustrates the proportion of respondents that feel rested enough to report for duty (A) and the self-reported average duration of sleep per day when working nights, days and when not scheduled to work (B).

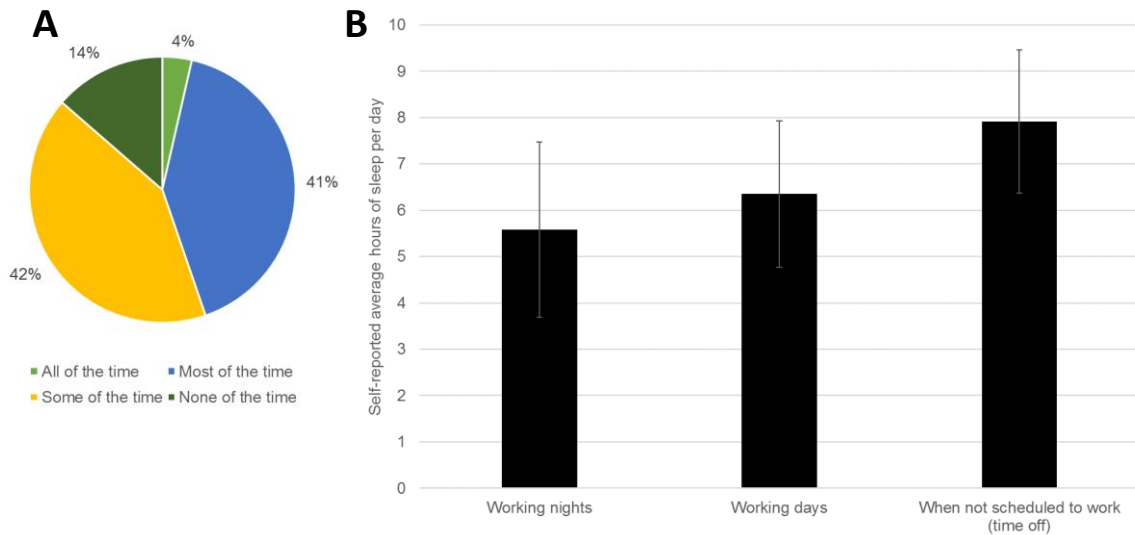
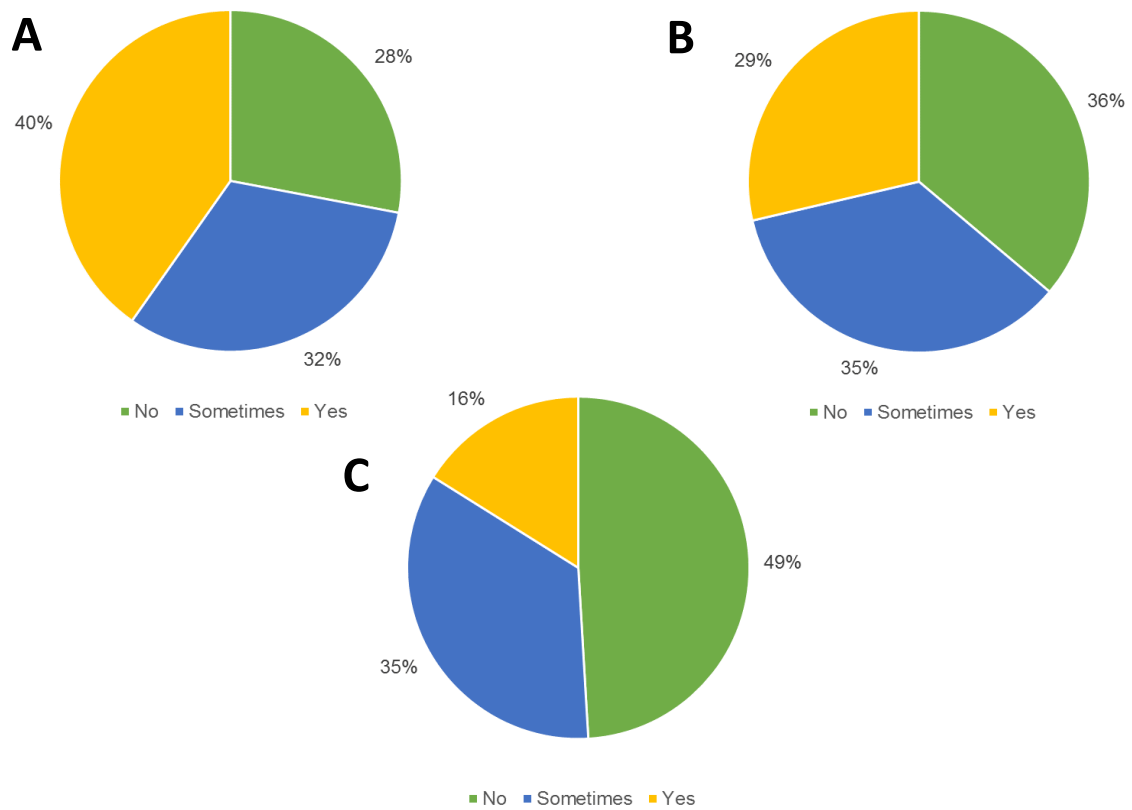


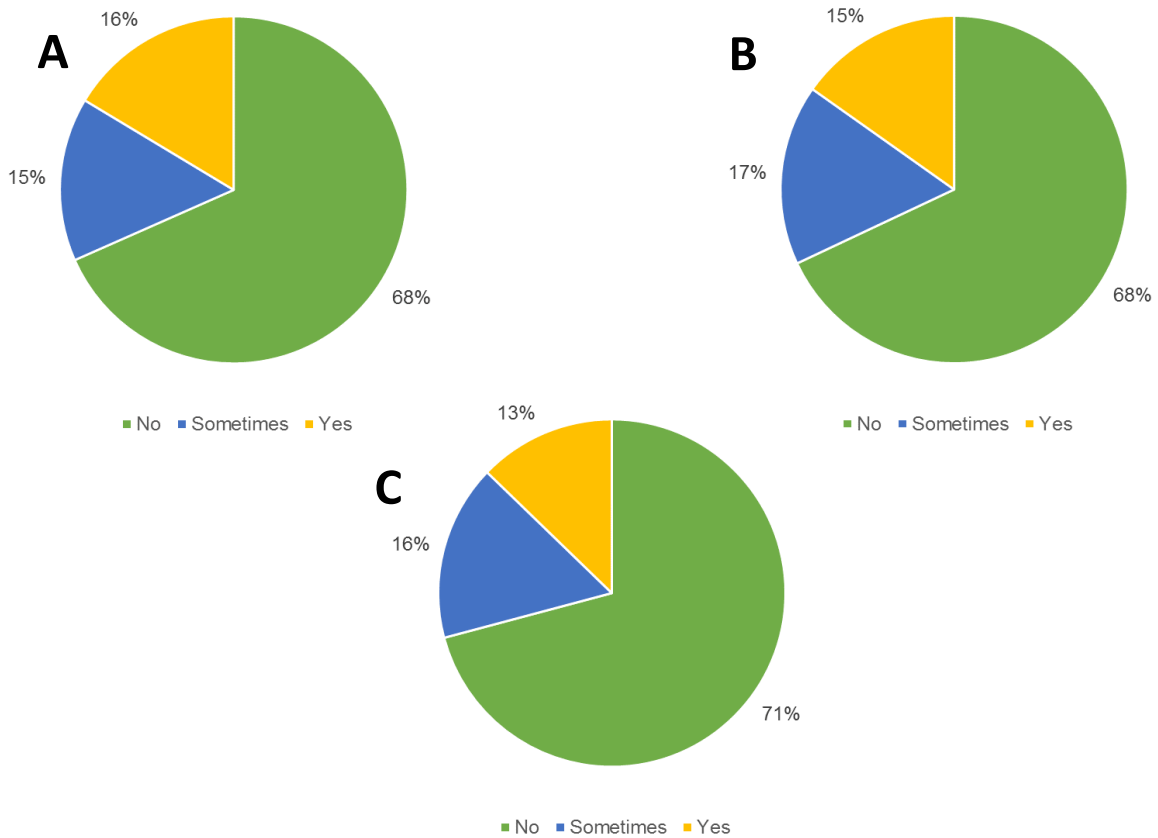
Figure 18: The percentage of CPHWS respondents who feel rested enough to report for duty (A) and the self-reported average ( $\pm$  standard error) duration of sleep per day when working nights, days and when not scheduled to work (B).

Figure 19 illustrates how many respondents report having trouble going to or staying asleep when working nights (A), days (B), and when not scheduled to work (C).



*Figure 19: The percentage of CPHWS respondents who report having trouble going to or staying asleep when working nights (A), days (B), and when not scheduled to work (C).*

Figure 20 illustrates how many respondents use sleep aids (e.g., medical devices (i.e., CPAP), dental devices (i.e., mouth guard), prescription medications, over-the-counter medications, etc.) when working nights (A), days (B), and when not scheduled to work (C).



*Figure 20: The percentage of CPHWS respondents who use sleep aids when working nights (A), days (B), and when not scheduled to work (C).*

Figure 21 illustrates how many respondents tend to wake up unexpectedly when working nights (A), days (B), and when not scheduled to work (C).

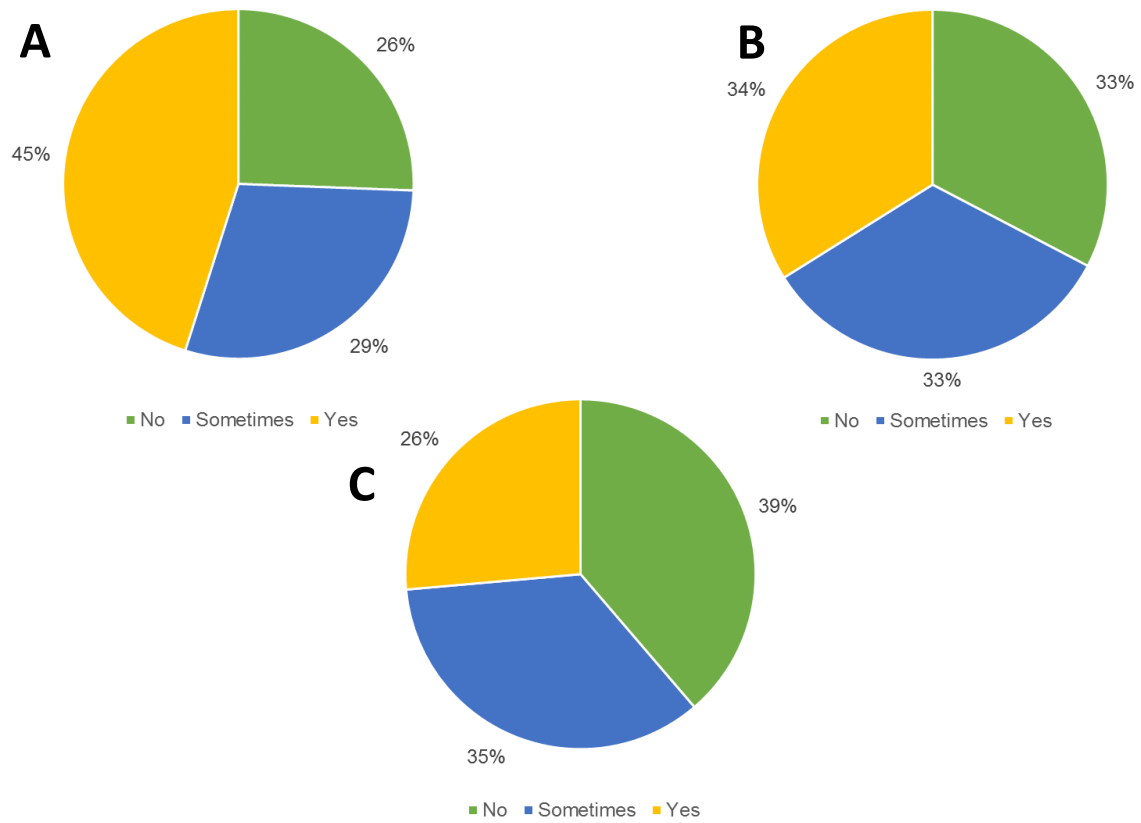


Figure 21: The percentage of CPHWS respondents who wake up unexpectedly when working nights (A), days (B), and when not scheduled to work (C).

Figure 22 illustrates how many respondents have difficulties staying awake when working nights (A), days (B), and when not scheduled to work (C).

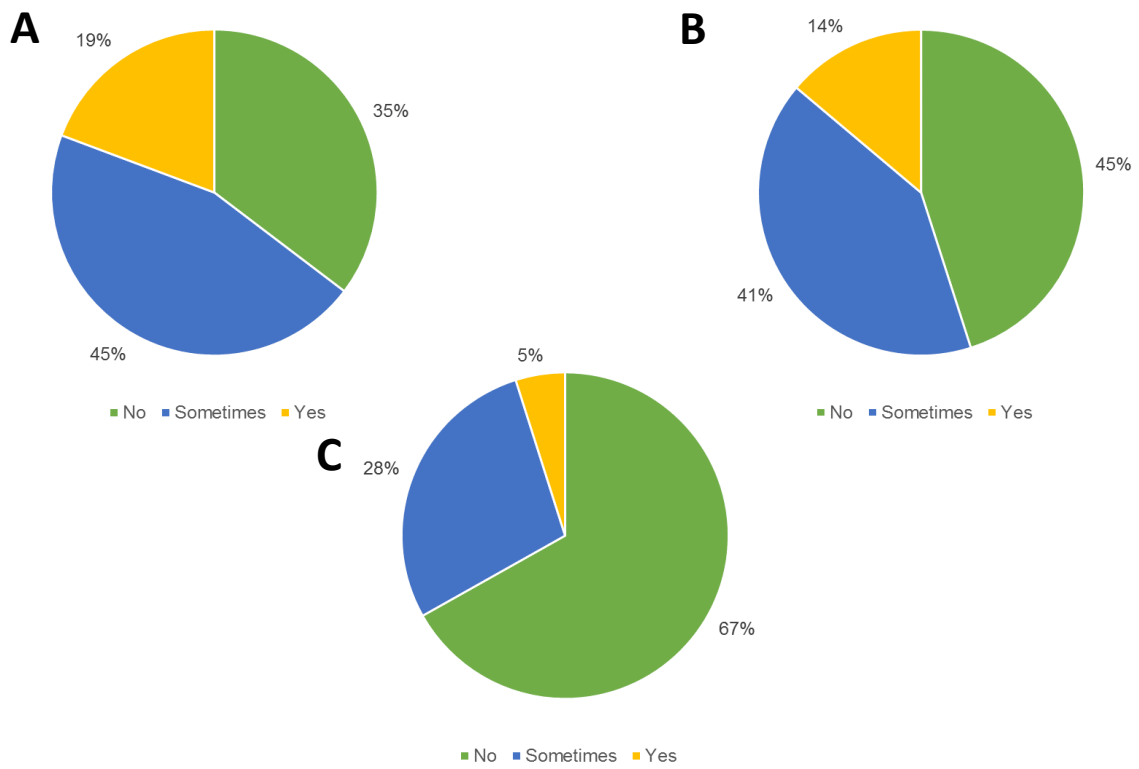
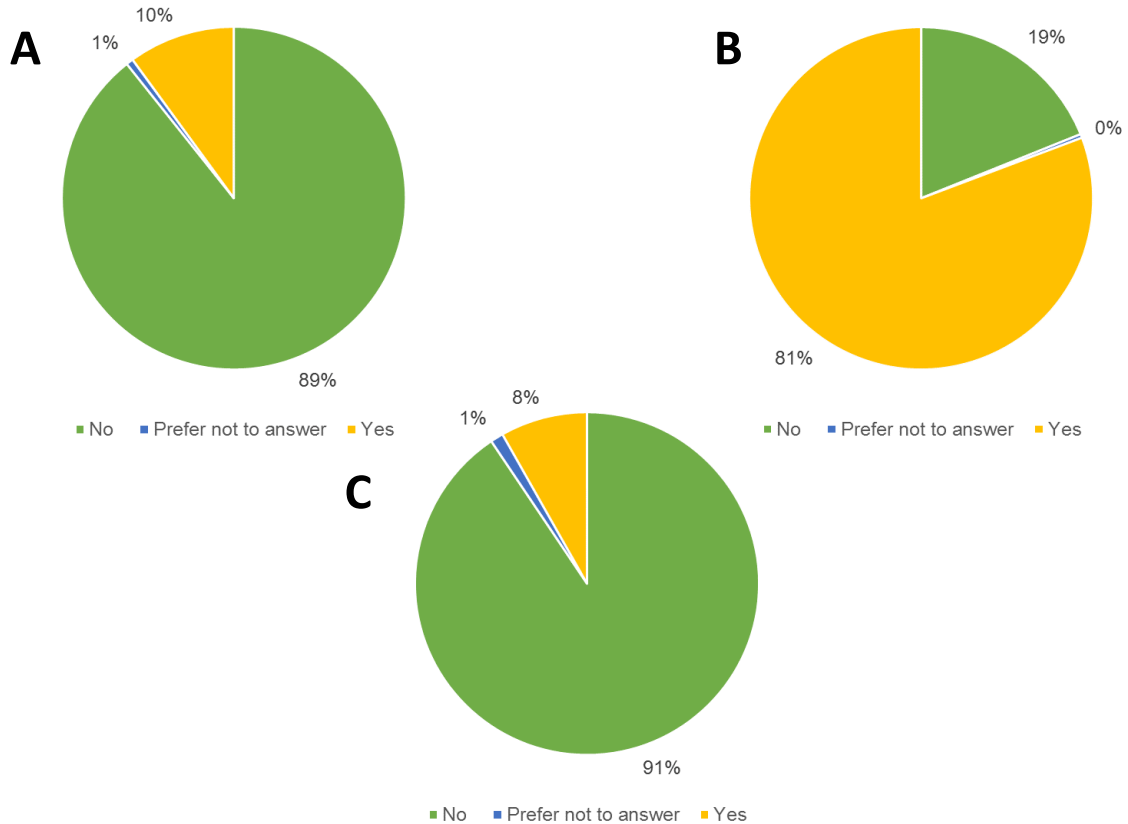


Figure 22: The percentage of CPHWS respondents who report having trouble staying awake when working nights (A), days (B), and when not scheduled to work (C).

Paramedics were asked to describe their use of tobacco (e.g., cigarettes, cigars, cigarillos, pipe, etc.), alcohol and controlled substances (e.g., narcotics, stimulants, depressants, hallucinogens, etc.). In the event that respondents consumed alcohol or used controlled substance(s), they were invited to identify reasons for use. Figure 23 illustrates the proportion of respondents that regularly use tobacco (A), consume alcohol (B), and use controlled substances (C).



*Figure 23: The percentage of CPHWS respondents who regularly use tobacco (A), consume alcohol (B), and use controlled substances (C).*

Figure 24 illustrates the proportion of paramedics that consume alcohol (A) or use controlled substances (B) for recreational purposes, pain control, or for other reasons.

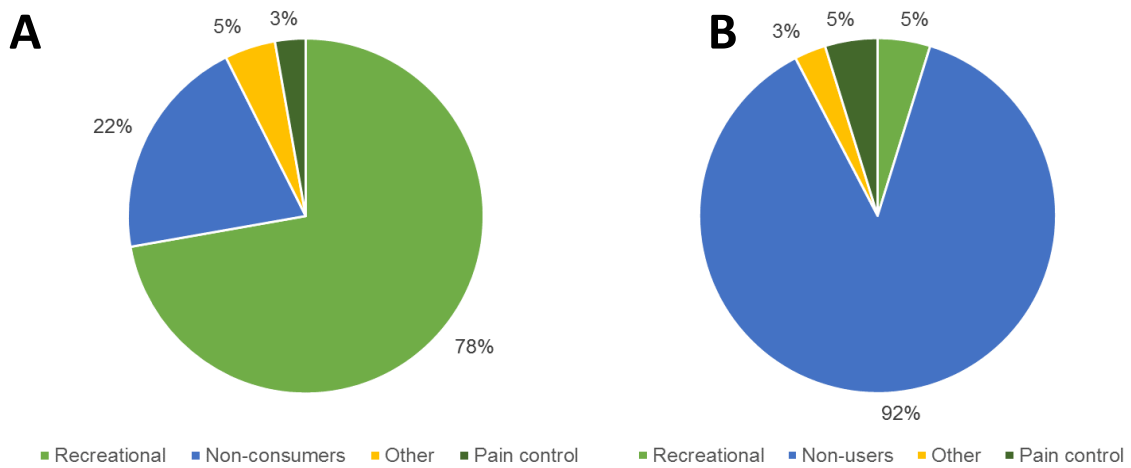


Figure 24: The percentage of CPHWS respondents who regularly consume alcohol (A), and controlled substances (B) for recreational purposes, pain control, or for other reasons.

### 3.4.2 Prevalence of pain, injury and health-related conditions

Prevalence of pain, injury and health related conditions might be important predictors of paramedics' health and wellness, and may affect the viability of a healthy workforce. Figure 25 illustrates the prevalence of health-related conditions within the Canadian paramedic population. Only conditions with a prevalence of 4% or greater are shown independently on Figure 25. Conditions with a prevalence less than 4%, including, cancer, chronic bronchitis, chronic obstructive pulmonary disease, colitis, Crohn's disease, Diabetes (type I and II), emphysema, fibromyalgia, gout, heart disease, hypotension, rheumatism, ulcers and vertigo, were grouped together in the "other" category.

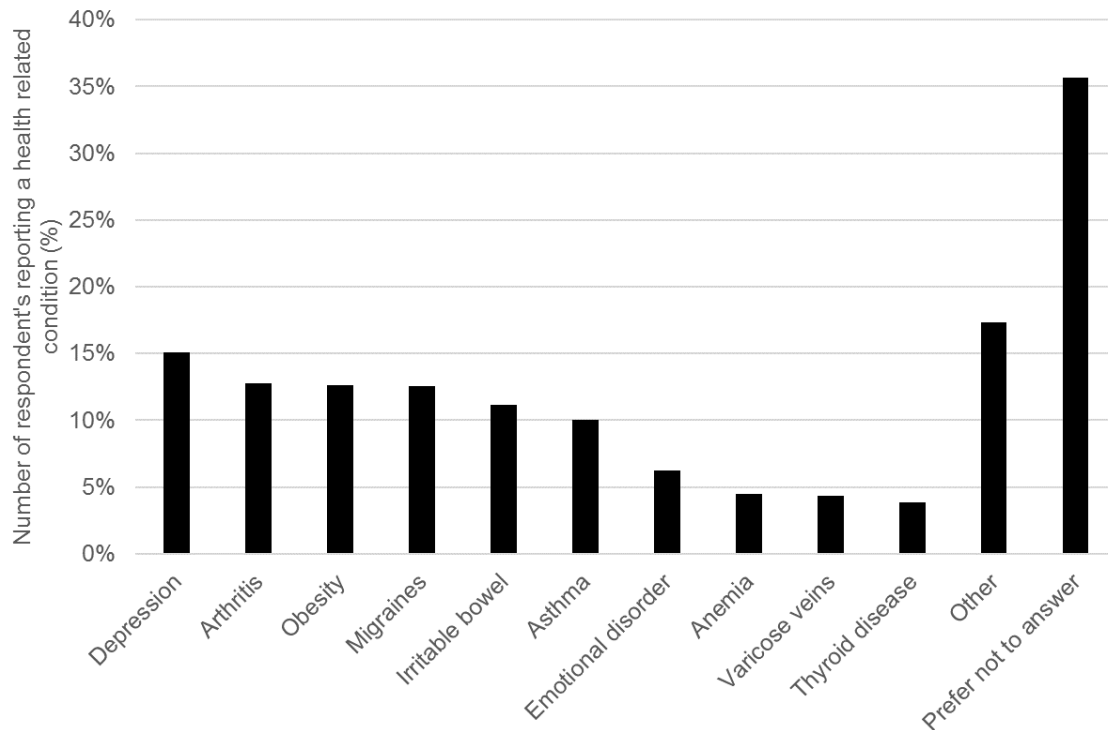


Figure 25: The prevalence of health-related conditions among respondents to the CPHWS.

Paramedics may take time off from work to deal with health-related conditions (both work-related and non-work-related). Figure 26 illustrates the proportion of paramedics taking time off of work due to health-related troubles (A) and the associated self-reported number of days lost due to health-related troubles (B).

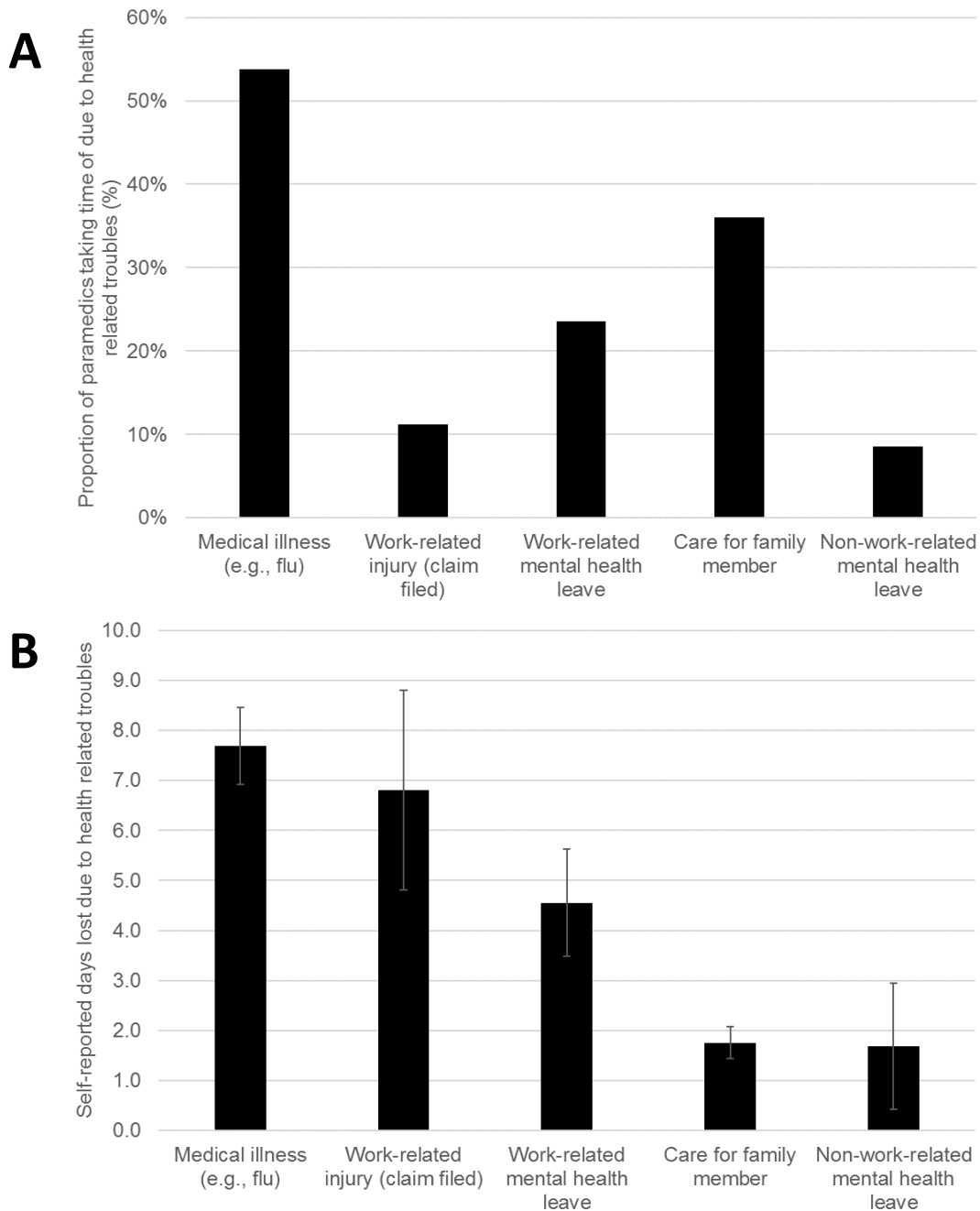
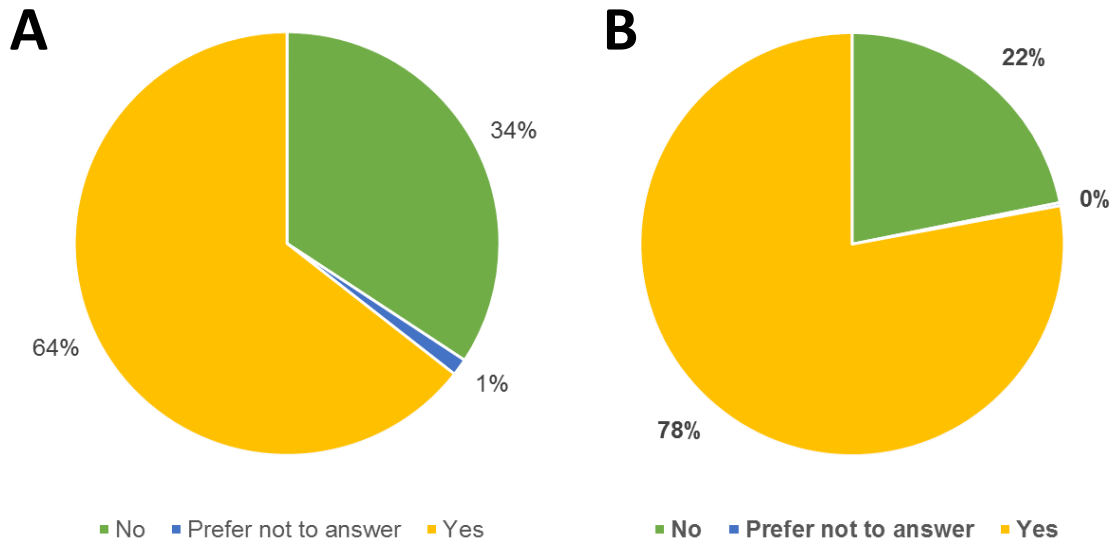


Figure 26: The proportion of CPHWS respondents that have taken time off (within the last 12-months) due to health-related troubles (A) and the average ( $\pm$  standard error) number of days lost (self-reported) (B).

Musculoskeletal injury is an unfortunate consequence of nearly all types of work. Paramedicine is no different. Figure 27 illustrates the proportion of paramedics that have been injured on the job (at any point in their career) (A) and the proportion of paramedics that have taken time off work due to a work-related injury (B).



*Figure 27: The percentage of CPHWS respondents who have suffered an injury on the job (A), and who have taken time of work because of a work-related injury (B), at some point in their career as a paramedic.*

Bodily pain and discomfort might be an important leading indicator of potential injury. Figure 28 illustrates the point prevalence of body discomfort by region (A) and the average severity of discomfort (0 – no discomfort; 10 – worst discomfort ever) (B) when paramedics' were asked to consider how their body felt at the end of their last shift.

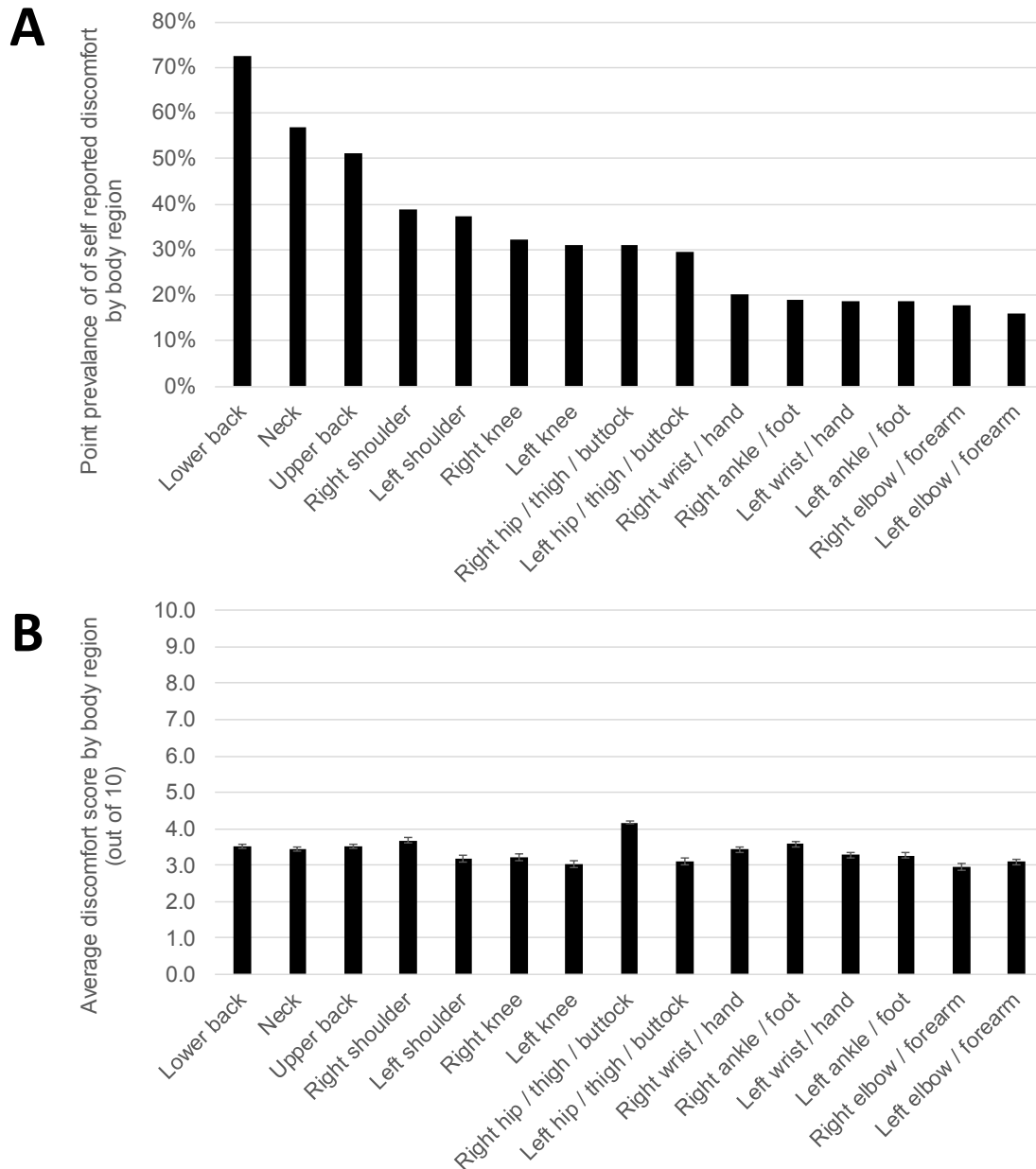


Figure 28: The proportion of CPHWS respondents that report body discomfort (A) and the average ( $\pm$  standard error) severity of discomfort (self-reported) (B), when consider the how their body felt at the end of their last shift.

### 3.4.3 Physical fitness appraisals

Objective physical fitness data were gathered from a small sample of paramedics (Table 1) as a form of cross-validation of the CPHWS results.

*Table 1: Physical fitness appraisal participant demographics and years experience.*

	Female (n=6)	Male (n=14)
Age (years)	32.7 ( $\pm 3.2$ )	37.6 ( $\pm 9.5$ )
Height (m)	1.64 ( $\pm 0.08$ )	1.79 ( $\pm 0.05$ )
Weight (kg)	66.5 ( $\pm 10.2$ )	82.3 ( $\pm 13.3$ )
Experience (years)	8.0 ( $\pm 3.3$ )	13.8 ( $\pm 10.3$ )

Generally, paramedics' physical fitness scores were equivalent to or better than the average Canadian (Table 2) based on comparisons to existing guidelines (Tiffin & Asher, 1948; CSEP, 2013). These findings are consistent with the results on the SF-36 (Figure 13, section 3.4.1) where paramedics' scores on the physical functioning domain were high, and consistent with data from the Canadian population at-large.

Table 2: Physical fitness appraisal scores compared to existing guidelines

	Males		Females	
	Sample Mean ( $\pm$ SD)	Interpretation	Sample Mean ( $\pm$ SD)	Interpretation
Grip Strength (kg)	105.7 ( $\pm$ 17.1)	Very Good	66.1 ( $\pm$ 8.1)	Very Good
Push-up (number)	28.7 ( $\pm$ 15.8)	Very Good	29.3 ( $\pm$ 10.1)	Excellent
Lower Body Power (W) - Vertical Jump	3728.5 ( $\pm$ 1063.2)	Fair	2877.0 ( $\pm$ 533.0)	Very Good
Back Extension Endurance (sec)	110.2 ( $\pm$ 35.1)	Very Good	133.3 ( $\pm$ 44.8)	Good
One leg Stance - Eyes Open (sec)	43.6 ( $\pm$ 3.6)	Equivalent to population mean	44.6 ( $\pm$ 1.1)	Equivalent to population mean
One leg Stance - Eyes Close (sec)	18.0 ( $\pm$ 15.6)	Equivalent to population mean	20.5 ( $\pm$ 16.2)	Above population mean
Pegboard - Right Hand (number)	15.4 ( $\pm$ 2.3)	Equivalent to population mean	17.3 ( $\pm$ 2.6)	Above population mean
Pegboard - Left Hand (number)	15.1 ( $\pm$ 2.2)	Equivalent to population mean	15.8 ( $\pm$ 2.6)	Above population mean
Pegboard - Both Hands (number)	25.5 ( $\pm$ 3.3)	Equivalent to population mean	28.5 ( $\pm$ 5.5)	Above population mean
Pegboard - Assembly (number)	9.1 ( $\pm$ 1.7)	Equivalent to population mean	9.8 ( $\pm$ 1.7)	Above population mean

## 4 Discussion and Recommendations

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The objective of this project was to gather critical information for the paramedic community, on the current sociodemographics, workforce profile, and health and wellness of the paramedic workforce. The results provide a description of the current sociodemographics, workforce profile, and health and wellness of the paramedic workforce. While primarily descriptive in nature, the results also highlight potential threats to paramedics' health and wellness, ultimately affecting the long-term viability of a healthy workforce. Fatigue and burnout represent an area of possible concern, emphasized by results from the DASS (Figures 10-11), SF-36 (Figure 13), feelings of readiness / rested for duty (Figure 18), and mental health focus group / interview results. The prevalence of work-related injury and body discomfort also represents an area of concern (section 3.4.3). Future efforts should aim to explore these data in more detail to identify potential causal factors offering opportunities to develop appropriate policies, practice and/or guidelines to continue to support paramedics' health and wellness, strengthening the viability and capability of Canada's paramedic workforce.

### 4.1.1 Recommendations

1. **Coordinated national investment supporting research to understand and improve the health and wellness of frontline paramedics.** While paramedic services operate as private/contracted, or provincially managed, or regionally managed, the work structure is similar where the majority of paramedics work rotating 12-hour shifts (days, evening, nights) plus mandatory overtime (i.e., shift overrun) (see Figures 3-4). Considering this similarity, it is likely that nationally funded and coordinated efforts to develop guidelines and frameworks, with the ability to be modified and adapted to local contexts, could be very useful to support paramedics' health and wellness across Canada.
2. **Development and implementation of a longitudinal study of Canadian paramedic health and wellness.** The current cross-sectional study only provides a snapshot of the current state of paramedic physical and mental health in Canada. In order to make effective and informed decisions with respect to health and workplace strategies moving forward, paramedic service organizations and government agencies will require data that provides information on existing and developing trends within the profession. The *LEADS* program in the United States offers a model to consider moving forward.
3. **Development of a national paramedic service organization registry.** Without a doubt the greatest challenge experienced in this study was the lack of a comprehensive contact list of all paramedic service providers (including contract, private, and industrial) in the country. Creating such a registry (include details such as: address, phone number, email contact information, along with the number of employees by type) would greatly facilitate communication efforts not only for researchers, but for individuals (i.e., Chiefs, Deputy Chiefs, Union officials, etc.) within the paramedic profession itself.
4. **Development of a national paramedic registry.** The creation of a paramedic specific registry (unrelated to a governing body) could facilitate identifying workforce trends over time, including movement within / between provinces, changes in skill level, exit patterns (i.e., retirement vs voluntary withdrawal from service), etc. Such a registry could be

particularly helpful in identifying recruitment and retention strategies and priorities. This could be facilitated by the Canadian Institute of Health Information (CIHI). CIHI is well situated to conduct routine workforce reviews within the health sector.

5. **Development of a national paramedic research registry.** The *Canadian Paramedic Health and Wellness* project research team received a considerable number of comments in the free-text section of the CPHWS, during the formal interviews, through unsolicited emails, and during impromptu conversations with paramedics across the country with respect to being ‘over-studied’. Canadian paramedics are being asked repeatedly to participate in many studies, often on the same, or closely related, topic areas. While this suggests that there is a great interest in studying the profession with the intent to better understand and improve paramedicine, unfortunately the repeated requests are placing an unnecessary burden on the paramedics. This in turn increases the risk of developing ‘research fatigue / study burnout’ (i.e., the notion that an individual stops participating in research because he/she has reached his/her personal capacity to do so). In addition, the lack of participation due to repetitive requests may unfortunately compromise research outcomes due to an insufficient amount of data and/or inadequate representative sampling. A national research registry wherein all paramedic research (direct and indirect) is catalogued and monitored could serve four critical functions. First, the registry would be able to identify gaps or redundancies in the research (i.e., identify topic areas that are being under-/ over-researched) thereby facilitating the development and implementation of research priorities and agendas based on evidence, rather than speculation. Second, the registry would help to foster collaboration among researchers across the country, leading to coordinated studies and a reduction of duplication (or even triplication) of research efforts. Third, in reducing the number of ‘duplicate’ studies, granting agencies (e.g., Canadian Institutes of Health Research, Social Sciences and Humanities Research Council, Natural Sciences and Engineering Research Council, DRDC CSS) and professional associations (e.g., PCC, PAC, OAPC, etc.) could allocate funding according to priorities, thereby maximizing the funds available for targeted initiatives. Finally, a centralized registry could decrease the burden currently being placed on paramedics, increase engagement on a national level, and ultimately, lead to research outcomes that will make a difference.

## 5 Conclusion

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This report describes the current sociodemographics, workforce profile, and health and wellness of the paramedic workforce in Canada. While only descriptive in nature, the data offer warning signs about paramedics' current health and wellbeing. Serving as a compass, the data orient our focus to concerns of mental wellness, physical injury, and fatigue/burnout as present day challenges that may effect the sustained viability of a healthy, able paramedic workforce. Continued and coordinated efforts should probe these concerns further, with some consideration of the establishment of Canadian Standards to offer common frameworks to support paramedic service organizations in developing locally effective programs and policies to effectively address paramedics' health and wellness.

As the first attempt to gather pan-Canadian information on the current state of paramedics in Canada, several challenges were encountered. In addition to the extensive descriptive data provided, this report offers several recommendations, based on those challenges, oriented at the creation of registries (e.g., service organizations, research efforts, paramedics). Establishing national registries could greatly enhance the professions ability to share information, leverage research and technology, and more readily maintain the "pulse" or other vital signs for the profession. The data clearly highlight potential concerns for paramedics across the country, where coordinated national effort and funding support will be essential to address these concerns before they become a limiting factor in paramedics' ability to provide timely and effective pre-hospital care to protect the health and safety of Canadians.

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## List of symbols/abbreviations/acronyms/initialisms

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ACP	Advanced Care Paramedic
CCP	Critical Care Paramedic
CCPE	Canadian Certified Professional Ergonomist
CPHWS	Canadian Paramedic Health and Wellness Survey
CSEP-PATH	Canadian Society for Exercise Physiology - Physical Activity Training for Health
CSS	Centre for Security Science
CSSP	Canadian Safety and Security Program
CUPE	Canadian Union of Public Employees
DASS	Depression, Anxiety, Stress Scales
DND	Department of National Defence
DRDC	Defence Research and Development Canada
EMR	Emergency Medical Responder
EMS	Emergency Medical Service
EMT	Emergency Medical Technician
FAQ	Frequently Asked Questions
LEADS	Longitudinal Emergency Medical Technicians (EMT) Attributes and Sociodemographics Study
PAC	Paramedic Association of Canada
PCC	Paramedic Chiefs of Canada
PCP	Primary Care Paramedic
PTSD	Post-Traumatic Stress Disorder
RA	Research Assistant
RKin	Registered Kinesiologist
SF-36	Short Form 36
SRC	Survey Research Centre
TCPS 2	Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, 2nd edition
TDM	Tailored Design Method

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**Introduction:** We know very little about paramedics in Canada, or about how their service to Canadian's might affect their health and wellness. The primary objective of this project was to gather baseline information to describe the workforce trends, sociodemographics, and current health and wellness of paramedics in Canada.

**Methods:** Data were collected using a multi-phased approach. Phase 1 involved administering a comprehensive survey to approximately 38,000 paramedics across the country. Phase 2 involved conducting in-depth focus group and personal interviews to further examine the topic of mental wellness. Phase 3 involved conducting physical fitness appraisals to further probe the topic of physical wellness.

**Results:** In Phase 1, 2,557 completed surveys were returned (2,488 web and 69 paper). Nearly 4 in 5 paramedics work 12-hour shifts, where 3 in 5 paramedic do so by rotating between day, night and evening shifts, and where nearly 4 in 5 also work required overtime. Survey and focus group findings identify indications of decline mental wellbeing, where Operational Factors; Organizational Climate Factors; and, Barriers to Good Mental Health were identified as pressing challenges. Survey and physical fitness appraisal results identify indications of injury, fatigue and burnout, but suggest that musculoskeletal health and fitness are in-line with normative data.

**Conclusion:** Regardless of the geographical location of the paramedics, results reveal that paramedic's work situations are similar and that their overall health and wellness are not ideal. Moving forward, it is important that effective pan-Canadian strategies are initiated to improve the health of paramedics, strengthening the ability of paramedic services to maintain an effective, capable workforce to continue supporting public safety in Canada through the provision of timely and effective pre-hospital emergency care.

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Paramedic service portfolio; Paramedic profession; First Responder Health and Wellness Profile; Human Resources Profile