RESEARCH AND EVALUATION

EXPLORING PSYCHOSOCIAL RISKS IN AMBULANCE WORKERS IN NEW ZEALAND - A SUMMARY REPORT

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WORKSAFE
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Authorship

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1. Background

Ambulance work has been identified as one of the most stressful and demanding occupations. Researchers have identified six main groups of psychosocial risks in ambulance psychosocial working environment, including pressure, overwhelm, emotional extremes, dissociation, multi-tasking, and disconnect (Duffee & Willis, 2023). A recently published cross-sectional survey in Germany has found that over three thirds of emergency workers (including ambulance people) poor communication, legal insecurity, lack of work cohesion among colleagues are the key sources of stress among emergency workers (including ambulance people) (Elsässer et al., 2024). Studies in the US and Sweden have also shown that those working in ambulance services are exposed to high job demand and overcommitment.

Psychological distress has become one of the greatest causes of occupational health problems at workplace. Ambulance personnel are at higher risks of psychosocial health outcomes, such as burnout, anxiety, depression, stress, sleep apnoea or poor health and wellbeing (Melander et al., 2024; Mildenhall, 2012). High job demands, lack of support from colleagues, and lack of support from the supervisors are the main causes of psychological distress in ambulance services workers (Bardhan & Byrd, 2023; Johnsen et al., 2023; Sterud et al., 2008; Van der Ploeg & Kleber, 2003).

Psychosocial health and wellbeing in ambulance personnel has not been well reported in New Zealand. The Psychosocial Survey of Healthcare workers in New Zealand (2024) showed that high Emotional Demands and high Role Conflicts are the most common psychosocial risks experienced by those working in ambulance services. They are also more likely to report exposure to Bullying, Sexual Harassment, and Threats of Violence than the average healthcare worker in the survey.

In 2024, WorkSafe New Zealand commissioned the research company Verian to conduct a Psychosocial Survey to have further exploration on the current level of psychosocial risks and health and wellbeing of police officers and ambulance workers in New Zealand. This summary report aims to provide some insights on the psychosocial factors of ambulance workers[1] in New Zealand through these two questions:

- What are the current psychosocial risks for ambulance workers in New Zealand?
- How do these psychosocial risks affect ambulance health and wellbeing?

[1] A separate report on key findings on psychosocial health and safety in police workers has been completed.

2. Measures

The survey used three sets of questionnaires: the Copenhagen Psychosocial Questionnaire (COPSOQ) version III, the Psychosocial Safety Climate 12 item (PSC-12), and the World Health Organization Five Wellbeing Index (WHO-5). Figure 2 overleaf describes all psychosocial scales in the survey.

2.1. The Copenhagen Psychosocial Questionnaire III (COPSOQ-III)[2]

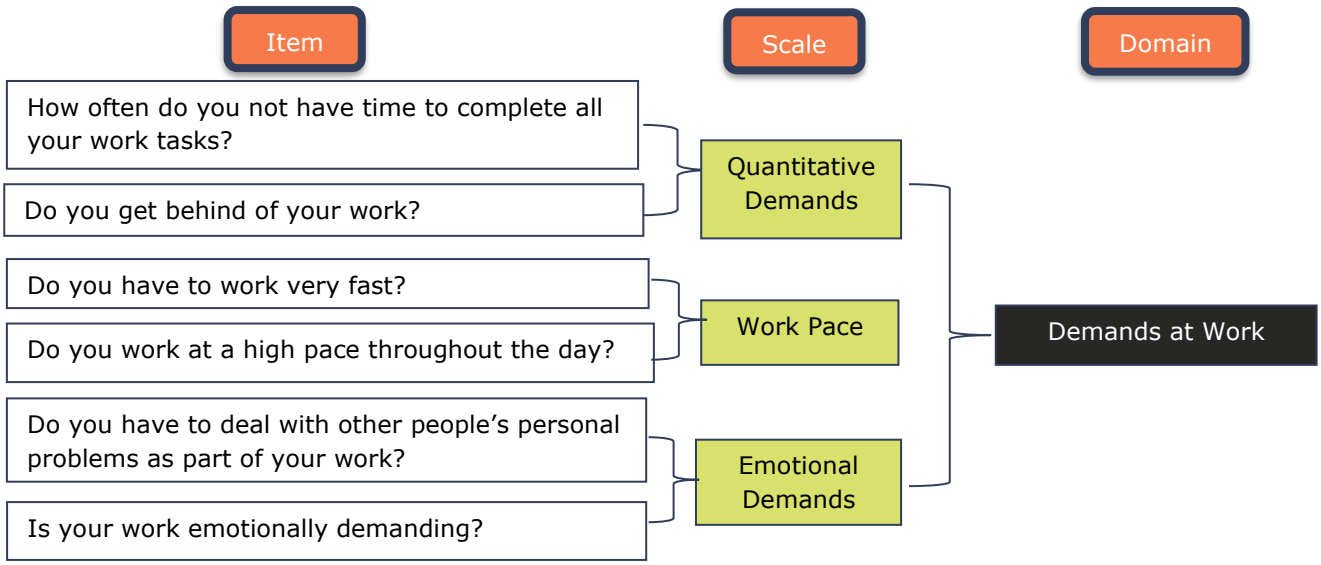
The COPSOQ-III comprises a range of five-point Likert format questions, wherein respondents state how frequently or to what extent they experience certain conditions at work. Each question is referred to as an item. The COPSOQ assigns a score between 0 and 100 as described in Table 1. Frequency of hostile acts (Bullying, Cyberbullying, Threats of Violence, Physical Violence and Sexual Harassment) is categorised into five groups: Yes, daily; Yes, weekly; Yes, monthly; Yes, a few times and No.

Table 1: Explanation of COPSOQ scores in the survey

Score	Frequency		Extent	Quality	Satisfaction
100	Always	All the time	To a very large extent	Excellent	Very satisfied
75	Often	A large part of the time	To a large extent	Very good	Satisfied
50	Sometimes	Part of the time	Somewhat	Good	Neither/Nor
25	Seldom	A small part of the time	To a small extent	Fair	Unsatisfied
0	Never/hardly ever	Not at all	To a very small extent	Poor	Very unsatisfied

Groups of items are referred to as a Scale (e.g., Quantitative Demand or Work Pace). The scale measures the respondent's overall level of exposure to a risk factor or condition. Scales are reported as a score between 0 and 100, representing the mean (average) score of the items within it. Finally, groups of Scales are referred to as a Domain. For example, in this survey a Domain 'Demands at Work' consists of three Scales: Quantitative Demands, Work Pace and Emotional Demands (see Figure 1 below).

Figure 1: Example of COPSOQ item, scale, and domain in the survey



(Please see the New Zealand Psychosocial Survey 2021 report on WorkSafe's website for more details on how to interpret COPSOQ items).

[2] For information on COPSOQ and how to use it, please check this website https://www.copsoq-network.org.

2.2. The Psychosocial Safety Climate 12 items (PSC - 12)

The survey used the Psychosocial Safety Climate - 12 items (PSC-12). *Psychosocial Safety Climate* (PSC) is "the shared belief held by workers that their psychosocial safety and wellbeing is protected and supported by senior management". The PSC-12 consists of four domains, including Management Commitment (MC), Management Prioritisation (MP), Organisational Communication (OC), and Organisational Participation (OP). Each domain contains three items. Respondents answered the question using five-point Likert scales from "strongly disagree" to "strongly agree" (scoring from 1-5). An item example of PSC-12 is "*In my workplace senior management acts quickly to correct problems/issues that affect employees' psychological health*".

Domain scores are the sum of three items in each domain with the minimum possible score of 3, and the maximum possible score of 15. The overall PSC scale is computed as the sum of 12 items. The minimum overall PSC score is 12 (highest risk), and the maximum possible score is 60 (lowest risk). With respect to the published benchmarks of PSC, a score below 37 is associated with a high risk of adverse mental health and wellbeing outcomes such as employee depression and job strain. A PSC score over 41 indicates that the work climate is performing well for worker psychological health and wellbeing.

2.3. The World Health Organization Wellbeing Five Index (WHO-5)[3]

Originating from a World Health Organization (WHO) meeting in Stockholm in 1998, the WHO-5 has become well-known and is used to assess psychological wellbeing. Since it is based on the Major Depression Inventory, which measures depression symptoms, the WHO-5 is used to explore the possibility of screening for depression (Topp et al., 2014).

The World Health Organization Wellbeing Five Index (WHO-5) questionnaire consists of five statements on how people have felt in the last 14 days. Respondents provide responses on a six-point Likert scale ranging from "At no time" (0) to "All the time" (5).

Below are the five statements asked in the WHO-5:

- I have felt cheerful in good spirits.
- I have felt calm and relaxed.
- I have felt active and vigorous.
- I woke up feeling fresh and rested.
- My daily life has been filled with things that interest me.

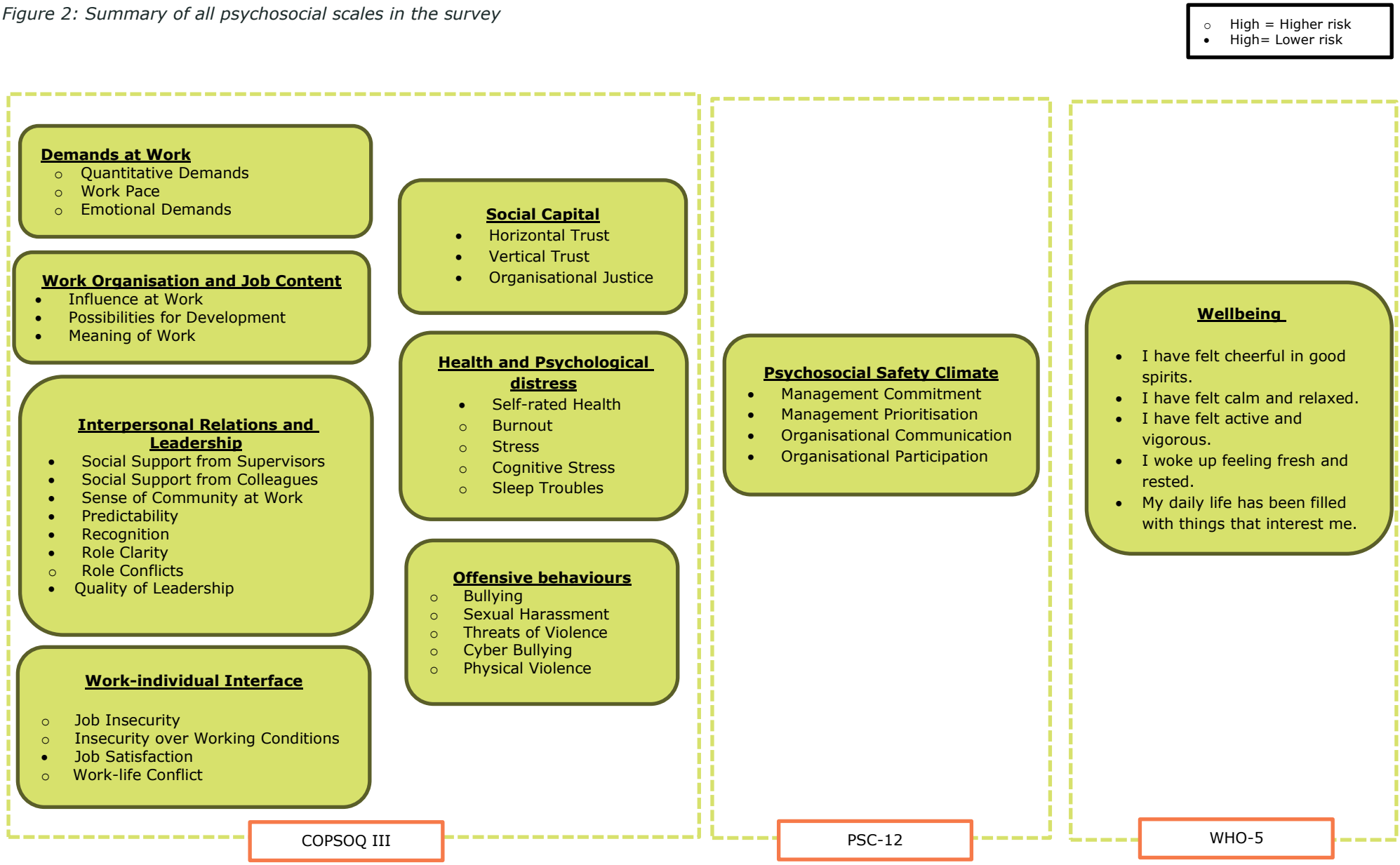
The raw score is calculated as the sum of all five answers. The raw score ranges from 0 to 25, 0 representing worst possible and 25 representing best possible quality of life. To obtain a percentage score ranging from 0 to 100, the raw score is multiplied by 4. A percentage score of 0 represents worst possible quality of life, whereas a score of 100 represents best possible quality of life. In this survey, the questionnaire was the original English version of the WHO-5 and no changes were made to content.

2.4. Scale reliability

All scales in the survey returned a Cronbach's alpha reliability between 0.6 and 1.0, except for Quantitative Demands (*please see Appendix 1 for more details*). The scale was considered as reliable when the Cronbach's alpha was bigger than 0.6 (Tavakol & Dennick, 2011).

[3] https://www.psykiatri-regionh.dk/who-5/Documents/WHO-5%20questionaire%20-%20English.pdf

Figure 2: Summary of all psychosocial scales in the survey



3. Key findings

3.1. Demands at Work

In this survey, the domain *Demands at Work* consists of three scales: Quantitative Demands, Work Pace and Emotional Demands. Scores on these scales range from 0-100. Higher scores are considered harmful for workers.

- The mean scores for Quantitative Demands, Work Pace and Emotional Demands in the survey respondents are 42.6, 58.2 and 67.8, respectively.
- There is significant difference in perception of Work Pace and Emotional Demands by age group. Ambulance workers aged 40 and below appear to face higher risk from higher Work Pace and Emotional Demands than those from 50 years and over.
- People who have been in the service for more than 10 years are more likely to experience higher Quantitative Demands and Emotional Demands than those who are new to the ambulance sector (with less than three years).
- Workers who work for more than 40 hours per week perceive higher Demands at Work than those who work for less than 40 hours weekly. The mean scores for Quantitative Demands, Work Pace and Emotional Demands are higher as the number of weekly working hours increases.
- Compared to workers who do not work at night, those who work between midnight and 5 am at least 3 hours per week report higher Work Pace and Emotional Demands.

3.2. Work Organisation and Job Content

In this survey, the *Work Organisation and Job Content* consist of three scales: Influence at Work, Possibilities for Development, and Meaning of Work. Scores on these scales range from 0-100. Lower scores are considered harmful for workers.

- The mean scores for Influence at Work, Possibilities for Development and Meaning of Work in the survey respondents are 52.3, 71.8 and 81.7, respectively.
- In the survey, young workers under 29 years of age report significantly higher Influence at Work, Possibilities for Development and Meaning of Work than the average survey respondent. On the other hand, ambulance workers aged 60 and over appear to report higher Possibilities for Development than the average respondent.
- People with more than 10 years working as ambulance workers report significantly lower scores for Possibilities for Development and Meaning of Work than those who are new to the ambulance sector (with less than three years).
- Workers who work less than 30 hours per week perceive less Influence at Work and Possibilities for Development than those who work more than 30 hours weekly. The mean scores for these two scales are higher as the number of weekly working hours increases.
- Compared to workers who do not work at night, those who work between midnight and 5 am at least 3 hours per week perceive higher Influence at Work, Possibilities for Development and Meaning of Work.

3.3. Interpersonal Relations and Leadership

In this survey, *Interpersonal Relations* consists of three scales: Social Support from Supervisors, Social Support from Colleagues and Sense of Community at Work (a feeling of being part of the team). Scores on these scales range from 0-100. Lower scores indicate higher risk for employees.

- The psychosocial factors scored as the most protective by the respondents are (medium) Social Support from Supervisors (63.1), (high) Social Support from Colleagues (73.3) and (high) Sense of Community at Work (77.2).

- Young ambulance workers under 29 years of age perceive significantly lower levels of Sense of Community than those aged from 40 and over. The mean scores are higher as the workers' age increases and reaches the highest for older workers aged 60 and above.

- People with more than 10 years working as ambulance workers perceive significantly lower levels of Social Support from Supervisors and Colleagues than those who are new to the ambulance sector (with less than three years).

In terms of *Leadership*, there are five scales: Predictability, Recognition, Role Clarity, Role Conflicts and Quality of Leadership (leadership capabilities of the next higher manager). Scores on these scales range from 0-100. Lower scores indicate higher risk for employees, except for Role Conflicts where lower scores are positive for employees.

- The mean scores reported by the survey participants for Predictability, Recognition, Role Clarity, Role Conflicts and Quality of Leadership are 51.9, 47.7, 68.0, 43.0 and 58.6, respectively.

- Compared to the average worker in the survey, those aged under 60 years and over perceive significantly higher Predictability, Recognition, Role Clarity and Quality of Leadership; and lower Role Conflicts.

- People with more than 10 years working as ambulance workers perceive significantly lower levels of Predictability, Recognition, Role Clarity and Quality of Leadership than those who are new to the ambulance sector (with less than three years). On the other hand, they are more likely to experience Role Conflict than workers who have been in the sector for less than three years.

- Workers who work less than 30 hours per week perceive higher Predictability, Recognition, Role Clarity and Quality of Leadership and lower Role Conflicts than those who work more than 30 hours weekly.

- Compared to workers who do not work at night, those who work between midnight and 5 am at least 3 hours per week perceive higher Predictability, Recognition, and Quality of Leadership and lower Role Conflicts.

3.4. Work-individual Interface

In this survey*, Work-individual Interface* consists of four scales, including Job Insecurity, Insecurity over Working conditions, Job Satisfaction and Work-life Conflict (to deal with the impact of work on personal life). Scores on these scales range from 0-100. Higher scores indicate higher risk for employees, except for Job Satisfaction where higher scores are positive for employees.

- Ambulance workers perceive (low) Job Insecurity and Insecurity over Working conditions, (high) Job Satisfaction and (medium) Work-life Conflict.

- Compared to the average worker in the survey, those aged under 60 years and over perceive significantly lower Job Security, Insecurity over Working conditions, and Work-life Conflict, but higher Job Satisfaction.

- People with less than 3 years working as ambulance workers perceive more secured in the job and over working conditions and less Work-life Conflict than workers who have been in the sector for more than 10 years.

- Workers who work less than 30 hours per week perceive higher Job Satisfaction and more secured over job and working condition, but less Work-life Conflict than those who work more than 30 hours weekly.

- Compared to those who do not work at night, ambulance workers who work between midnight and 5 am at least 3 hours per week appear to face risk from higher Work-life Conflict.

3.5. Social Capital

In this survey, *Social Capital* consists of the three scales, including Horizontal Trust, Vertical Trust and Organisational Justice (whether employees are fairly treated at work). Scores on these scales range from 0-100. Higher scores are considered positive for employees.

- The mean scores for Horizontal Trust, Vertical Trust and Organisational Justice reported by the survey participants are 62.4, 58.2 and 54.1, respectively.
- Compared to their female colleague, male ambulance workers perceive higher Horizontal Trust.
- Workers aged under 60 years and over are more likely to report higher Social Capital (all three scales) than the average worker in the survey.
- Workers who have been in the ambulance sector for less than 3 years perceive higher Social Capital. The mean scores of all three Social Capital scales decrease as the length in the service increases.
- Workers who work less than 30 hours weekly perceive higher Social Capital. The reported mean scores of all three scales of Social Capital decrease as the number of working hours per week increases.
- Compared to those who do not work at night, ambulance workers who work between midnight and 5 am at least 3 hours per week are more likely to report lower levels of Social Capital.

3.6. Offensive behaviours in the ambulance working environment

The survey focuses on five types of *offensive behaviours* at work; including Bullying, Sexual Harassment, Threats of Violence, Cyber Bullying and Physical Violence.

- Over half (56.4%) of the survey participants report experiencing at least one form of offensive behaviours, with Threats of Violence and Physical Violence being the top two common hostile acts.
- Compared to their male colleagues, female ambulance workers are more likely to report experiencing Sexual Harassment (16.6% compared to 8.4%). However, male workers are more likely report exposure to Threats of Violence and Physical Violence.
- Young workers under 30 years of age are more likely to be exposed to Sexual Harassment, Threats of Violence and Physical Violence than older workers aged 60 and over.
- Workers who are new to the sector (less than 3 years) are less likely to report experiencing Physical Violence than those with more than 10 years working as ambulance workers.
- Workers who work for more than 51 hours per week are most likely to be exposed to all five types of offensive behaviours. Exposure to hostile acts is less prevalent as the average weekly working hours decrease.

3.7. Health and psychological distress

In this survey, *health and psychological distress* consists of the following scales: Self-rated Health, Burnout, Stress, Cognitive Stress and Sleep Troubles.

Scores on Self-rated Health range from 0-100, with 0 for poor and 1000 for excellent. On the other hand, scores for psychological distress (including Burnout, Stress, Cognitive Stress and Sleep Troubles) ranges from to 0-100. Higher scores mean are harmful to workers.

- About eight in ten (80.5%) ambulance workers in the survey rate their health as "good", "very good" and "excellent". The mean score for Self-rated Health is 59.5 among surveyed respondents.

- Some of 17.0% of the survey respondent report experiencing all the time at least one health problem (either Burnout, Stress, Cognitive Stress or Sleep Troubles).

- Young ambulance workers aged 29 years and below perceive significantly higher levels of Burnout, Stress, Cognitive Stress or Sleep Troubles than older workers aged 60 and over. They also rate their health poorer than their older colleagues.

- Workers who work for more than 51 hours per week appear to perceive the highest level of Burnout, Stress, Cognitive Stress or Sleep Troubles. The mean scores of these health problems decrease if the weekly working hours are less.

- Compared to those who do not work at night, ambulance workers who work between midnight and 5 am at least 3 hours per week are more likely to rate their general health better and perceive lower levels of health issues.

3.8. Psychosocial Safety Climate in the ambulance environment

In this survey, the overall PSC score is 37.3, indicating a low level of psychosocial safety climate in participating ambulance workers. Over four in ten (44%) respondents report the overall PSC score below 37.

- Gender and age are significant contributors to individual perception on PSC. Male workers report lower score of PSC than their female colleagues. Ambulance workers aged 60 years and over perceive significantly higher score of PSC than young workers aged 29 years and below.
- Workers who are new to the sector (with less than a year) perceive higher level of PSC than those with more than 10 years in the service.
- Those working less than 30 hours per week report significantly higher scores of PSC than others. The overall PSC score decreases as the working hours per week increase.
- Compared to those who do not work at night, ambulance workers who work between midnight and 5 am at least 3 hours per week are more likely to perceive higher PSC scores.

3.9. Ambulance workers' wellbeing

In this study, workers' *wellbeing and quality of life* is explored through the World Health Organization's five-item Wellbeing Index (WHO-5). The WHO-5 includes five statements on how workers felt within the 14 days prior to the survey. Scores of each statement range from 0 (At no time) to 5 (All of the time). The total WHO-5 percentage score ranges from 0 (worst possible quality of life) to 100 (best possible quality of life).

Wellbeing score in this study is defined as dichotomised variables with a cut-off point at the scores of 50. A mean score lower or equal to 50 indicates poor wellbeing.

The reported mean score for WHO-5 for ambulance workers in the survey is 60.0. Some of 28.9% of the survey respondents indicate wellbeing score of 50 and below.

- Workers aged 50 years and above report significantly higher mean score for wellbeing than the young workers aged 29 and below.

- Workers who are new to the sector (with less than a year) perceive a higher level of wellbeing than those with more than 10 years in the service.

- Those working less than 30 hours per week perceive higher scores of wellbeing than other groups. The mean score for WHO-5 wellbeing decreases as the working hours per week increase.

- Compared to those who do not work at night, ambulance workers who work between midnight and 5 am at least 3 hours per week are more likely to perceive higher wellbeing scores.

4. Summary and limitations

The current survey examines a wide range of psychosocial factors, including demands at work, work organisation and job content, interpersonal relations and leadership, work individual interface, social capital, health and psychological distress, offensive behaviours, psychosocial safety climate and wellbeing in ambulance service workers.

High Emotional Demands, Threats of Violence and lack of Recognition are the most common psychosocial risks experienced by ambulance personnel. Workers who have been in the ambulance services for more than 10 years report higher Emotional Demands and less Recognition. On the other hand, those who are new to the sector are more likely to be exposed to Threats of Violence. Age plays a vital role in workers' perception on psychosocial risks in the workplace. Compared to young workers aged 29 years and below, older workers perceive less Emotional Demands and higher Recognition. They are less likely to be exposed to Threats of Violence.

Despite some perceptions on the psychosocial risks, the survey respondents report a high level of Meaning of Work and express a strong sense of being part of the team (Sense of Community at Work). Young ambulance workers under 29 years of age perceive significantly lower levels of Sense of Community than those aged from 40 and over.

The survey has found that four in ten (44%) respondents report the overall Psychosocial Safety Climate (PSC) score below 37. With respect to the published benchmarks of PSC, a score below 37 is associated with a high risk of adverse mental health and wellbeing outcomes such as employee depression and job strain. Individual perception on PSC differs significantly by age, gender, length in the ambulance services and the number of work hours per week.

However, the survey has limitations in relation to the participants.

- First, due to the difficulties of recruitment method, the survey did not capture full information on the source population for assessing the representativeness of the survey samples. For example, Wellington Free Ambulance acknowledged that current information on the number of staff at the time of the survey might be less than the actual number of contacts provided. In addition, participants from Hato Hone St John were oversampled in the survey. Ambulance organisations varied in who they targeted with the survey whether non-frontline staff and volunteers were included. Therefore, it is unlikely to compare the perception of psychosocial factors among ambulance service providers.

- All surveys are subject to non-response bias. Whether this survey method suffers from a degree of subject related response bias is pertinent. To minimise this risk, the survey company Verian developed communications (including the survey invitation) that broadly described the topic (without specific reference to psycho-social harm), however, ambulance organisations may have also used other communications to describe the survey.

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6. Appendix 1: Methodology summary

Population of interest

The population of interest for this survey was people aged 18 years and over who were working as ambulance workers. The research surveyed a total of 1551 ambulance workers.

Fieldwork and sample size

The data collection was completed online, between 5 November 2023 – 7 February 2024.

The survey yielded a total of 1551 ambulance workers from Wellington Ambulance, Air Ambulance Services and Hato Hone St John.

Table 2: Summary of method used by each ambulance organisation

Ambulance organisation	Survey method	Pre-notification comms	Fieldwork period	Total population and sample size provided	Achieved sample size n =	Response rate
Wellington Free Ambulance (WFA)	Online survey – contact list shared with Verian	WFA included information in an internal newsletter emailed to staff on 2 November.	5 November 2023 – 7 February 2024	Total employees: 415 staff and 96 volunteers Contacts provided: 566 WFA acknowledges that current information on the number of staff in November is less than the actual number of contacts provided.	161	28%
Air Ambulance Services	Online survey – contact list shared with Verian	Air Ambulance Services shared an email with staff on 1 November.	7-27 November 2023	Total employees: 130. Contacts provided: 53*. The list provided comprised operational aeromedical persons (flight crew, clinical personnel, coordination team and Ambulance drivers) The only exclusions were persons who were non-aeromedical operations related, i.e., finance, charter ops, engineering ops, and management that are not associated with the medical element of the business.	23	43%
Hato Hone St John	Online survey – FR organisation emailed individual staff inviting them to take part in the survey.	Hato Hone St John included information in a National Operations Bulletin.	20 November 2023 – 7 February 2024	Total staff: 5,742 paid staff, 9,001 volunteers, and 3,044 youth. FR organisation emailed all 4,456 staff with an Authority to Practice (ATP). Youth were excluded.	1,366	31%

Analysis

All analysis was performed in-house using RStudio 4.0.5. Reported differences between groups (or between a certain group and the average) are statistically significant at the 95% confidence level ($p<0.05$) unless stated otherwise. The reliability of each of the scales and subscales used in the survey was checked for internal consistency of responses using Cronbach's alpha.

Survey participants

The survey sample covered 1551 respondents. About 51.8% of the sample were women.

- Nearly a quarter (23.6%) of the participants are from 50 to 59 years old, followed by those aged 29 years and below (20.9%).
- Some of 43.3% of the survey respondents have been in the service for more than 10 years.
- Over 70% of the participants worked 41 hours and more per week.
- Approximately 79.0% of the respondents do not have direct reports, and over 60% of them report working at least three hours per week from midnight to 5 am.

Table 3 below shows how respondents are distributed across all demographic and occupational characteristics.

Table 3: A snapshot of the survey sample

Items	**Total (N=)**	**%**
Total sample	**1551**	100
Gender		
Male	716	46.1
Female	803	51.8
Gender diverse/Prefer not to say	22	2.1
Age group		
<=29	312	20.1
30-39	308	19.9
40-49	271	17.4
50-59	366	23.6
>=60	259	16.7
Length in the service		
Less than 3 years	433	27.9
4-9 years	444	28.6
More than 10 years	672	43.3
Average weekly working hours		
Less than 30 hours	258	16.6
31-40 hours	132	8.5
41-50 hours	704	45.4
51 hours and more	404	26.0
Direct reports		
Yes	280	18.1
No	1227	79.1
Night work		
Yes	953	61.4
No	570	36.8
Ambulance agency		
Wellington Ambulance	161	10.4
Air Ambulance Services	23	1.5
Hato Hone St John	1367	88.1

7. Appendix 2: Definitions of the psychosocial items in the survey

Measure	Domain	Item	Definition
COPSOQIII	Demands at Work	Quantitative Demands	how much a person can perform in their work or if the workers are behind their schedule
		Work Pace	the speed at which tasks have to be performed
		Emotional Demands	dealing with other people's feelings or being placed in emotionally difficult situations at work
	Work organisation and job content	Influence at Work	the capacity to have an effect on how work is done, for example, planning work or prioritising tasks
		Possibilities for Development	opportunities for learning and career development
		Meaning of Work	understanding how workers' work contributes to the organisation
	Interpersonal relations and leadership	Predictability	receiving relevant information to avoid uncertainty and insecurity at work
		Recognition	workers' effort at work is valued and acknowledged by their manager
		Role Clarity	ability to understand responsibilities, expectations, and tasks at work
		Role Conflicts	possible conflict arising from task demands or prioritisation
		Quality of Leadership	leadership capabilities of the next higher manager
		Social Support from Supervisors	support for workers' direct manager if they need it
		Social Support from Colleagues	support from colleagues if the workers need it
		Sense of Community at Work	a feeling of being part of the team
	Work-individual Interface	Job insecurity	to deal with all forms of employment security
		Insecurity over Working Conditions	to deal with the changing of working schedule or content, for example working hours or relocation
		Job Satisfaction	level of contentment employees feel with their job
		Work-life Conflict	to deal with the impact of work on personal life
	Social Capital	Horizontal Trust	trust built among employees and if the employees trust each other
		Vertical Trust	trust built between employees and managers
		Organisational Justice	whether employees are fairly treated at work
	Health and Psychosocial Distress	Self-rated Health	personal assessment of their own health
		Sleep Troubles	sleep length, quality of sleep, or interruptions of sleep
		Burnout	physical and emotional exhaustion
		Stress	problems relaxing
		Cognitive Stress	problems concentrating
	Offensive behaviours	Bullying	repeated exposure to unpleasant or degrading treatment in the workplace and the workers find it hard to protect themselves at work
		Sexual Harassment	exposure to unwanted sexual-related behaviours at work
		Threats of Violence	exposure to threat of violence at work
		Physical Violence	exposure to physical violence at work
		Cyberbullying	exposure to harassment at work through social media such as phone text or internet, etc

Measure	Domain	Item	Definition
Psychosocial Safety Climate (PSC)		Management Commitment	senior management support and commitment for stress prevention through involvement and commitment
		Management Priority	management priority to psychological health and safety versus productivity goals
		Organisation Communication	organisational communication, that is, the organisation listens to contributions from employees
		Organisational Participation	organisational participation and involvement, for example, participation and consultation occurs with unions, and occupational health and safety representatives
WHO-5 Index			how workers felt within the 14 days prior to the survey

8. Appendix 3: Mean, standard deviation and Cronbach's alpha of survey variables

Psychosocial factors					Psychosocial factors			
	Cronbach's alpha	M	SD			Cronbach's alpha	M	SD
WHO-5 Well-being	0.9	60.0	18.8		Insecurity over Working Conditions		14.2	24.4
Quantitative Demands	0.4	42.6	21.7		Job Satisfaction		73.9	19.8
Work Pace	0.7	58.2	20.1		Work-life Conflict	0.9	44.5	27.8
Emotional Demands	0.7	67.8	24.9		Horizontal Trust		62.4	22.4
Influence at Work		52.3	27.5		Vertical Trust	0.8	58.2	23.1
Possibilities for Development	0.6	71.8	19.8		Organisational Justice	0.7	54.1	21.7
Meaning of Work		81.7	19.6		Self-rated Health		59.4	24.8
Predictability	0.7	51.9	21.1		Sleep Troubles	0.9	44.1	23.8
Recognition		47.7	28.1		Burnout	0.8	44.8	24.9
Role Clarity		68.0	22.6		Stress		37.6	27.5
Role Conflicts	0.7	43.0	23.0		Cognitive Stress		36.4	24.7
Quality of Leadership	0.9	58.6	27.3		PSC- Management Commitment	0.9	9.2	3.0
Social Support from Supervisors		63.1	31.0		PSC-Management Priority	0.9	9.2	3.2
Social Support from Colleagues		73.3	23.6		PSC-Organisational Commitment	0.8	9.3	2.5
Sense of Community at Work		77.2	19.6		PSC-Organisational Participation	0.8	9.6	2.5
Job Insecurity	0.6	28.7	25.8		Overall PSC score	1.0	37.3	10.1

M- Mean; SD- Standard Deviation; PSC- Psychosocial safety climate; Cronbach's alpha measures the scale reliability.
(-): Not available (single item).

9. Appendix 4: Psychosocial factors by gender and age of the survey respondents

Questionnaire set	Scales	All ambulance workers in the survey	Gender		Age				
			Male	Female	<=29	30 - 39	40 - 49	50 - 59	60+
	Base (N=)	1551	716	803	312	308	271	366	259
WHO 5 Wellbeing Index	WHO-5 Wellbeing	60.0	60.9	59.4	56.9	55.6	58.9	61.7	69.3
COPSOQ III	Quantitative Demand	42.6	42.7	42.6	41.5	45.7	43.9	41.2	40.7
	Work Pace	58.2	58.7	57.7	64.8	64.1	57.1	55.0	48.6
	Emotional Demands	67.8	68.3	67.3	75.1	75.6	68.4	62.7	56.3
	Influence at Work	52.3	53.5	51.4	56.4	54.5	50.2	49.2	52.1
	Possibilities for Development	71.8	71.3	72.4	77.2	71.8	71.9	70.9	67.2
	Meaning of Work	81.7	81.5	82.2	84.4	80.0	82.7	80.7	82.5
	Predictability	51.9	51.9	52.3	50.7	49.1	51.2	53.4	56.6
	Recognition	47.7	47.6	48.0	46.0	43.3	48.3	48.2	55.4
	Role Clarity	68.0	67.5	68.7	67.8	65.5	67.0	68.9	72.5
	Role Conflicts	43.0	44.3	41.7	48.4	47.8	43.8	40.2	33.0
	Quality of Leadership	58.6	58.0	59.3	61.4	57.5	55.9	57.7	61.9
	Social Support from Supervisors	63.1	61.0	65.1	63.6	62.0	62.2	62.3	67.0
	Social Support from colleagues	73.3	72.3	74.2	75.3	73.6	73.2	70.4	74.9
	Sense of Community at Work	77.2	77.5	77.2	74.0	74.0	77.7	78.2	83.1
	Job Insecurity	28.7	29.5	27.7	29.3	29.5	27.5	29.9	23.2
	Insecurity over Working Conditions	14.2	14.7	13.5	11.8	16.9	13.8	16.5	10.2
	Job Satisfaction	73.9	74.2	73.9	72.0	70.8	74.3	75.0	80.0
	Work life Conflict	44.5	45.3	43.6	52.2	52.2	46.0	41.1	28.6
	Horizontal Trust	62.4	65.6	59.8	61.7	60.1	60.8	62.1	69.5
	Vertical Trust	58.2	57.0	59.5	57.6	54.7	56.9	58.5	65.2
	Organisational Justice	54.1	54.7	53.6	55.8	50.4	51.9	53.9	60.0
	Self-rated health	59.4	58.2	60.6	54.9	53.3	60.0	62.8	67.4
	Sleep Troubles	44.1	43.1	44.9	47.2	45.4	44.7	44.1	37.5
	Burnout	44.8	42.4	46.9	55.2	50.8	45.2	40.8	29.6
	Stress	37.6	36.9	38.3	45.3	44.3	38.3	34.0	24.3
	Cognitive Stress	36.4	34.7	37.6	46.2	42.5	37.8	30.6	23.9

Questionnaire set	Scales	All ambulance workers in the survey	Gender		Age				
			Male	Female	<=29	30 - 39	40 - 49	50 - 59	60+
	Bullying	26.6	24.4	27.8	27.2	29.5	27.7	26.2	18.9
	Sexual Harassment	13.1	8.4	16.6	31.7	15.3	10.7	4.4	2.7
	Threats of Violence	38.7	42.9	34.9	55.4	45.1	40.6	30.3	22.4
	Physical Violence	29.1	33.5	24.8	38.8	33.4	31.7	26.5	14.3
	Cyberbullying	15.2	15.6	14.4	16.3	15.6	16.2	16.4	8.5
Psychosocial Safety Climate - 12 items (PSC-12)	Management Commitment	9.2	9.0	9.4	9.3	9.0	9.0	9.3	9.8
	Management Priority	9.2	9.0	9.4	9.2	8.8	9.1	9.3	9.9
	Organisational Commitment	9.3	9.2	9.4	9.4	9.0	9.3	9.3	9.7
	Organisational Participation	9.6	9.4	9.7	9.9	9.3	9.3	9.6	9.9
	PSC12- Total	37.3	36.6	38.0	37.8	36.1	36.7	37.5	39.3

Mean scores are reported, except for offensive behaviours (Bullying, Sexual Harassment, Threats of Violence, Physical Violence and Cyberbullying) where proportions are calculated.

10. Appendix 5: Psychosocial factors by length in the service, weekly average work hours and nightshift of the survey respondents

Questionnaire set	Scales	All ambulance workers in the survey	Length in the service			Weekly average work hours				Nightshift	
			Less than 3 years	4 - 9 years	More than 10 years	Less than 30 hours	31-40 hours	41-50 hours	>=51 hours	Yes	No
	Base (N=)	1551	433	444	672	258	132	704	404	953	570
WHO 5 Wellbeing Index	WHO-5 Wellbeing	60.0	63.3	59.2	58.4	67.3	65.7	58.3	56.1	58.3	63.1
COPSOQ III	Quantitative Demand	42.6	38.6	41.6	45.8	37.4	38.4	42.8	47.6	42.6	42.7
	Work Pace	58.2	57.6	58.4	58.5	49.1	54.2	59.1	64.9	60.7	53.9
	Emotional Demands	67.8	65.0	69.3	68.6	53.8	59.0	72.0	74.5	74.1	57.6
	Influence at Work	52.3	51.4	52.4	53.0	45.3	52.3	55.1	53.5	53.6	50.4
	Possibilities for Development	71.8	76.3	72.2	68.8	68.5	71.2	73.8	71.9	74.1	68.4
	Meaning of Work	81.7	86.1	81.1	79.4	83.6	80.1	82.1	81.6	82.6	80.5
	Predictability	51.9	55.7	49.5	51.2	56.4	54.1	52.3	47.9	50.5	54.5
	Recognition	47.7	54.7	44.9	45.0	54.9	51.9	47.8	42.3	43.8	54.5
	Role Clarity	68.0	72.7	66.4	66.2	71.7	68.9	68.9	64.9	67.5	69.0
	Role Conflicts	43.0	38.7	44.2	44.9	32.9	37.7	44.8	48.4	46.3	37.3
	Quality of Leadership	58.6	64.6	57.2	55.6	63.2	64.3	58.4	54.6	56.3	63.0
	Social Support from Supervisors	63.1	68.0	63.2	59.9	62.5	66.7	65.6	59.5	61.5	66.1
	Social Support from colleagues	73.3	77.4	74.5	69.7	74.4	71.8	74.6	71.8	74.2	72.1
	Sense of Community at Work	77.2	79.0	75.5	77.4	80.2	77.1	76.6	77.1	76.4	78.9
	Job Insecurity	28.7	27.1	25.2	31.9	21.8	27.9	29.2	30.7	29.0	27.1
	Insecurity over Working Conditions	14.2	13.4	10.9	16.9	8.4	11.7	15.7	16.2	14.6	13.3
	Job Satisfaction	73.9	75.9	73.3	73.1	76.7	77.7	74.6	71.0	73.7	74.7
	Work life Conflict	44.5	41.0	44.2	46.9	28.7	34.8	47.3	54.3	49.7	35.4
	Horizontal Trust	62.4	66.5	60.9	60.8	68.8	62.7	62.4	59.2	61.4	64.7

Questionnaire set	Scales	All ambulance workers in the survey	Length in the service			Weekly average work hours				Nightshift	
			Less than 3 years	4 - 9 years	More than 10 years	Less than 30 hours	31-40 hours	41-50 hours	>=51 hours	Yes	No
	Vertical Trust	58.2	66.7	56.1	54.2	66.0	63.6	57.0	53.8	55.2	63.6
	Organisational Justice	54.1	60.4	53.9	50.1	62.4	57.9	53.7	49.1	51.9	58.1
	Self-rated health	59.4	61.0	59.7	58.1	66.6	65.5	58.0	55.4	57.6	62.5
	Sleep Troubles	44.1	41.9	44.9	45.0	36.3	38.4	44.9	50.3	47.5	38.5
	Burnout	44.8	43.7	46.4	44.4	34.8	37.9	46.3	52.1	47.9	39.5
	Stress	37.6	35.9	38.5	38.2	28.9	34.3	37.4	45.8	40.3	32.8
	Cognitive Stress	36.4	36.3	38.3	35.1	29.9	34.8	37.3	40.5	39.0	32.0
	Bullying	26.6	24.9	25.7	28.0	15.9	18.9	27.7	33.2	31.0	18.2
	Sexual Harassment	13.1	16.9	16.9	8.0	4.7	7.6	16.9	14.1	17.4	5.6
	Threats of Violence	38.7	32.8	43.7	39.1	19.8	25.8	44.0	48.3	49.9	20.4
	Physical Violence	29.1	24.5	31.8	30.2	14.3	17.4	34.4	35.9	38.4	13.9
	Cyberbullying	15.2	10.2	14.6	18.6	5.8	12.1	16.8	19.3	17.2	11.2
Psychosocial Safety Climate - 12 items (PSC-12)	Management Commitment	9.2	10.2	9.0	8.7	10.2	9.8	9.1	8.7	8.9	9.8
	Management Priority	9.2	10.3	9.0	8.7	10.2	10.0	9.1	8.6	8.8	10.0
	Organisational Commitment	9.3	10.0	9.2	8.9	9.9	9.9	9.3	8.8	9.0	9.7
	Organisational Participation	9.6	10.3	9.6	9.1	10.1	9.9	9.6	9.2	9.3	10.0
	PSC12- Total	37.3	40.9	36.7	35.4	40.5	39.7	37.0	35.3	36.0	39.5

Mean scores are reported, except for offensive behaviours (Bullying, Sexual Harassment, Threats of Violence, Physical Violence and Cyberbullying) where proportions are calculated.