OCCUPATIONAL HEALTH AND SAFETY RISK FACTORS FOR RURAL AND METROPOLITAN NURSES:

COMPARATIVE RESULTS FROM A NATIONAL NURSES SURVEY

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Australian Government
Australian Safety and Compensation Council

Occupational Health and Safety risk factors for rural and metropolitan nurses: comparative results from a national nurses survey

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Glossary

AIHW	Australian Institute of Health and Welfare
ANF	Australian Nursing Federation
ASCC	Australian Safety and Compensation Council
CVD	Cardiovascular disease
JDCS	Job-demand-control-support
NIOSH	National Institute of Occupational Safety and Health
OHS	Occupational Health and Safety

Executive Summary

Background

Nurses have been found to be exposed to a wide range of occupational hazards. They are particularly vulnerable to several diseases and injuries, including musculoskeletal injuries, latex allergies and needlestick injuries. Concerns have been raised in the research literature that rural and remote workplaces pose further and unique demands and risks on nurses. However, there is relatively little information regarding hazards faced by Australian nurses in rural and remote areas.

The Office of the Australian Safety and Compensation Council (the Office of the ASCC) conducted a survey in February 2007 on occupational exposures in Australian nurses. General results arising from the study were published in 2008 (see Driscoll, 2008a). The report recommended that an in-depth comparison between rural and metropolitan participants of the survey be undertaken.

This report describes the differences in perceived occupational hazards for rural (or remote) and metropolitan nurses that were found in the 2007 survey in order to inform and facilitate effective policy formulation and OHS intervention.

Method

Nine-hundred and fifty-five nurses participated in the survey of which 219 (22.9%) were located in a remote or rural area. Differences in the general demographic profile, occupational profile and occupational health and safety issues between the two groups of nurses were analysed.

The survey uses the question “Where is your workplace located: metropolitan (city or major town) or rural/remote?” to determine nurses’ workplace location. In future studies to increase the sensitivity it is recommended that this question be rephrased to determine if nurses are employed in: inner regional, outer regional, metropolitan or remote/very remote areas when access to services may be an underlying issue.

Results

Rural/remote nurses were more likely than their metropolitan counterparts to work in small workplaces, in aged or community care, or in medical or emergency department areas. They were less likely than metropolitan nurses to perceive themselves as having good career opportunities or receiving appropriate respect for their work. In terms of workplace hazards, rural/remote nurses perceived themselves as being less at risk to bloodborne pathogens and noise levels and more at risk to temperature extremes than did metropolitan nurses. Rural/ remote nurses lifted or transferred patients more often than their metropolitan

counterparts, and were more likely to use mechanical lifting devices or gait belts when doing so.

Although rural/remote nurses do not perceive themselves to be at higher risk of workplace stress, they are more likely than metropolitan nurses to perceive themselves as having low support from colleagues.

Conclusion

The national survey identified differences in perceived occupational hazards for rural and remote nurses, compared to their metropolitan counterparts, which largely reflect differences in nurses' occupational and workplace profiles.

Chapter 1. Introduction

The Office of the Australian Safety and Compensation Council (the Office of the ASCC) conducted a survey in February 2007 on occupational exposures in Australian nurses. General results arising from the study were published in 2008 (see Driscoll, 2008a). The report recommended that an in-depth comparison between rural and metropolitan participants of the survey be undertaken.

This report describes the differences in perceived occupational hazards for rural (or remote) and metropolitan nurses that were found in the 2007 survey in order to inform and facilitate effective policy formulation and OHS intervention.

Several studies have examined the relationship between workplace hazards and resultant injuries and diseases for those in the nursing profession. Nurses have been found to be exposed to a wide range of occupational hazards such as biological-infectious, chemical, environmental-mechanical, physical and psychosocial hazards (Rogers & Travers, 1991). In a recent study of occupational exposures in Australian nurses conducted by the Office of the ASCC, respondents were asked to indicate the level of risk they perceived from a number of workplace hazards. Of those surveyed, 61% perceived themselves to be at 'high risk' from workplace stress and approximately 40% perceived themselves to be at 'high risk' from lifting and repositioning heavy objects, needlestick and other sharps, prolonged standing and bloodborne pathogens (Driscoll, 2008a).

As a result of exposure to these occupational hazards, nurses are particularly vulnerable to a number of diseases and injuries. For example, studies report that nurses are at high risk of musculoskeletal disorders with prevalence rates for neck, shoulder or lower back disorders for nurses ranging from 40–50% (Daraiseh et al., 2003). A systematic review of the literature found that 4.0–4.6% of all health care workers, including nurses, were allergic to latex, resulting in conditions such as dermatitis, asthma and rhinoconjunctivitis (Bousquet et al., 2006). Needlestick and other sharps injuries are also a concern, with two thirds of all reported sharps injuries occurring in nurses. It has been found that nurses receive sharps injuries at a rate of about 1 per year (Hanrahan & Reutter, 1997). These injuries and diseases affect the capacity of nurses to work. The Office of the ASCC found that 51.2% of participating nurses had sustained a work-related injury or disease that required them to take time off work over the course of their nursing career (Driscoll, 2008a).

There are several reasons why nurses working in rural and remote areas may be more exposed to workplace hazards than their metropolitan counterparts. For example, rural and remote nurses may have inadequate educational preparation for the unique demands of rural and remote healthcare. It has been found that undergraduate nursing does not routinely incorporate specific preparation for practice in a rural or

remote setting (Duffy, Siegloff & Kent, 1998). Further, isolation and prohibitive costs make access to ongoing education to maintain currency of skills and knowledge difficult (Francis, 2005). Other specific factors that have been found particularly applicable to nurses in rural and remote Australia include lack of staff, high workload, lack of support services, absence of medical officers, career disadvantage, restructures and changes in rural and remote health services, and the need for nurses to take on extended roles (Hegney, Pearson & McCarthy, 2002). Also, there are often inadequate resources, poor systems, unrealistic expectations from communities and managers, perceived lack of support from management and high stress (Weymouth et al., 2007).

Despite there being a reasonable basis for nurses working in rural and remote settings having particular occupational health and safety concerns, there is relatively little information regarding the differences in hazards for these nurses compared to nurses generally. The limited evidence indicating that rural/remote nurses are more greatly exposed to workplace hazards includes evidence for increased risk to musculoskeletal disorders, violence and workplace stress.

Musculoskeletal disorders have been found to be higher among Australian rural nursing students compared to their international counterparts (Smith & Leggat, 2004). This may be due to poor workplace design and the autonomous nature of rural and remote practice which necessitates lifting heavy equipment without help (Hegney et al., 2002).

Australian nurses in rural areas have been found to be at greater risk of violence in the workplace (Mayhew & Chappell, 2003). This may be because patients admitted from rural areas may be more likely to be aggressive than metropolitan patients, possibly as a consequence of reduced or delayed entry into mental health services (Cuffel, 1994).

The work environment of rural and remote nurses puts them at a high risk to occupational stress (Machin, Fogarty & Albion, 2001). One recent study found that Australian rural nurses reported higher levels of distress and lower levels of morale compared with other health professionals, with the organisational climate of the work environment being largely responsible (Albion, Fogarty & Machin, 2005). Another Australian study found that the majority of Victorian rural psychiatric nurses reported nursing as stressful to some degree (Pinikahana & Happell, 2004). In that study, it was found that ‘workload’ was the highest perceived stressor whereas ‘lack of support’ and ‘conflict with other nurses’ were perceived as the lowest stressors in the rural nursing environment. Other research has found high work demands and lack of workplace support to be significant predictors of occupational stress (Stansfeld & Candy, 2006).

In summary, research supports the notion that nursing is a hazardous occupation. Moreover, nursing in rural and remote workplaces may be particularly hazardous for a number of reasons. Although limited, the available literature suggests that rural and remote nurses are particularly vulnerable to musculoskeletal disorders, violence and workplace stress.

Chapter 2. Method

In February 2007 the Office of the ASCC conducted an online industry-specific survey of Australian nurses' exposures to hazards in the workplace. Two companion reports outlining the methodology and main results of this study have been produced (Driscoll 2008a, 2008b).

The survey instrument was an adapted version of the Employee Core Module of the National Institute of Occupational Safety and Health (NIOSH) National Exposures at Work Survey in the United States of America. Participants were members of the Australian Nursing Federation (ANF) who cover approximately 55% of the Australian registered nursing population. Participants were recruited based on email addresses which were provided by five of the eight jurisdictions of the ANF. In total, emails were sent to 8,967 ANF members and 955 surveys were completed. However, due to jurisdictional differences in how email addresses were acquired, and the possibility that emails were blocked by firewalls and spam protectors, the number of potential participants who actually received an email was not known, and therefore the response rate could not be calculated.

The only known area in which ANF members had a different distribution compared to all nurses was gender, with a higher proportion of ANF being males in comparison to the general nursing workforce. However, by analysing the composition of the sample, it was found those who took part in the study can be considered reasonably representative of all ANF members and of the whole Australian nursing workforce (Driscoll, 2008a). Driscoll (2008a) provides further information regarding the methodology of this study.

The current study used data from the online survey to identify the key occupational health and safety (OHS) issues affecting rural and remote nurses in comparison with metropolitan nurses. Chapter 3 outlines the general demographic and occupational profile differences between the two groups of nurses. Chapter 4 outlines the differences between rural/remote and metropolitan nurses in terms of the occupational health and safety issues affecting them, and on several occupational hazards they currently encounter. Chapter 5 presents a more detailed analysis of workplace stress for rural and remote nurses.

Chapter 3. General profile of rural and metropolitan nurses

According to the Australian Institute of Health and Welfare (AIHW) Nursing and Midwifery Labour Force Survey (AIHW, 2006), there were 243,916 registered or enrolled Australian nurses in 2004. Of these, 204,584 (83.9%) worked in a metropolitan workplace and 28,950 (11.9%) worked in a rural or remote workplace. The remaining 10,382 (4.2%) did not state the location of their workplace.

Of the sample of nurses who responded to the survey in the current study, 736 (77%) stated that they were from a city or major town while 219 (22.9%) stated that they were from a rural or remote area. Appendix A contains a summary of the key demographical differences between rural/remote and metropolitan nurses.

Chapter 3 highlights

- On average, rural/remote nurses are older (46.2 years) than metropolitan nurses (43.4 years).
- Rural/remote nurses are more likely to be working in small to medium sized facilities (89.9%). Metropolitan nurses are more likely to be working in large facilities with over 1000 employees (45.2%).
- A higher proportion of rural/remote nurses than metropolitan nurses report working in aged, community and palliative care. A higher proportion of metropolitan nurses work in surgical and specialist areas.
- Rural/remote nurses and metropolitan nurses generally report having good job security. However, there are differences in perceived career prospects: rural/remote nurses are less likely to report having good opportunities for promotion, increase in income or professional development and less likely to believe they receive the respect they deserve.
- Rural/remote nurses are more likely than metropolitan nurses to believe that their family and/or friends dislike how often they are preoccupied with work while at home.
- Rural/remote nurses are less likely than metropolitan nurses to come home from work too tired to do some of the things they like.

Demographic profile

The survey revealed that nurses working in remote and rural workplaces have a statistically significantly older age profile compared to those working in metropolitan areas (Figure 1). In particular, rural/remote nurses are on average 2.8 years older than metropolitan nurses (mean age = 46.2 years vs. 43.4 years).

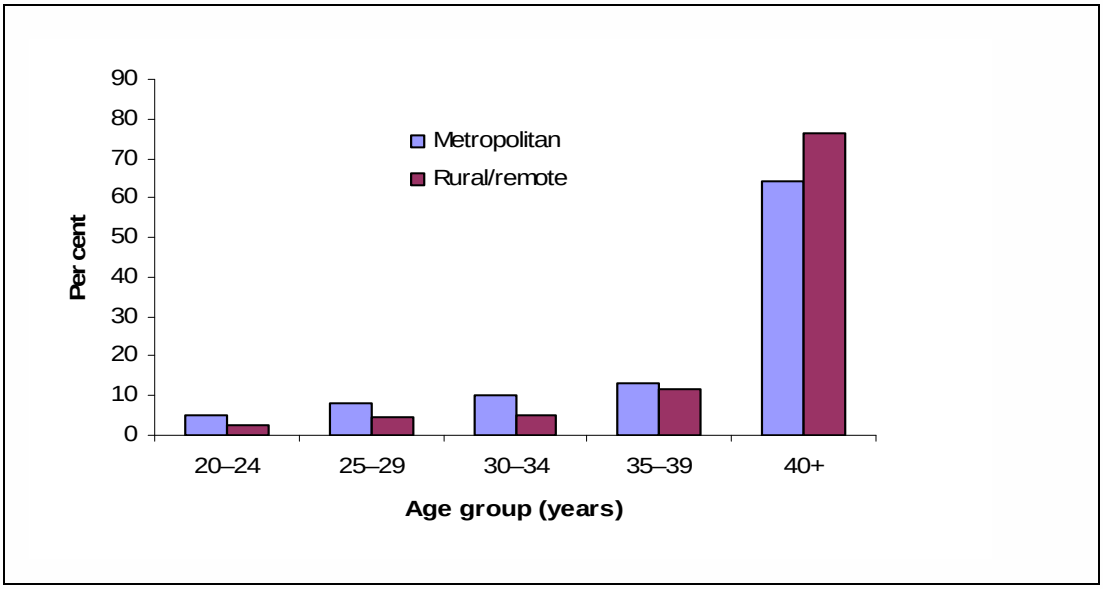

Figure 1. Age distribution of nurses, by work location

A significantly larger proportion of male nurses work in metropolitan areas (16.2%) compared with rural and remote areas (8.7%).

In keeping with the national distribution of the jurisdictions, most survey participants came from New South Wales, Queensland or Victoria, with a larger proportion of rural and remote respondents coming from New South Wales (Table 1). Table 1 also displays the distribution of the nursing population across states using data from the AIHW 2004 Nursing and Midwifery Labour Force Survey (AIHW, 2006) as a comparison. Information regarding the Northern Territory and the Australian Capital Territory was limited and no information regarding Western Australia was obtained as email addresses from these jurisdictions were not made available.

Table 1. Jurisdiction of work location

State/Territory most work performed in	Work location (%)			
	Metropolitan		Rural / remote	
	Nurses study (N = 736)	Australian nurses population* (N=185 679†)	Nurses study (N = 219)	Australian nurses population* (N = 25 368†)
Australian Capital Territory	0.1	2.1	0.0	0.0
New South Wales	23.8	35.9	33.8	22.6
Northern Territory	0.0	0.0	1.8	8.9
Queensland	26.9	16.8	20.5	33.3
South Australia	17.5	9.8	14.2	12.5
Tasmania	5.8	2.4	7.8	5.9
Victoria	25.8	32.9	21.9	16.7
Western Australia	–	–	–	–
Total	100.0	100.0	100.0	100.0

*Source: AIHW Nursing and midwifery labour force survey 2004 (AIHW, 2006).
†Excluding the Western Australian population

Occupational profile

According to the current study, the majority of nurses in metropolitan and rural areas are registered nurses. There is a larger proportion of metropolitan nurses (60.2%) currently employed as registered nurses in comparison to rural/remote nurses (51.6%) (Figure 2). A larger proportion of rural/remote nurses are represented as assistants in nursing or enrolled nurses. This suggests that rural and remote areas have a higher proportion of nurses with lower qualifications. It is also possible that metropolitan workplaces such as hospitals employ a higher proportion of skilled nurses.

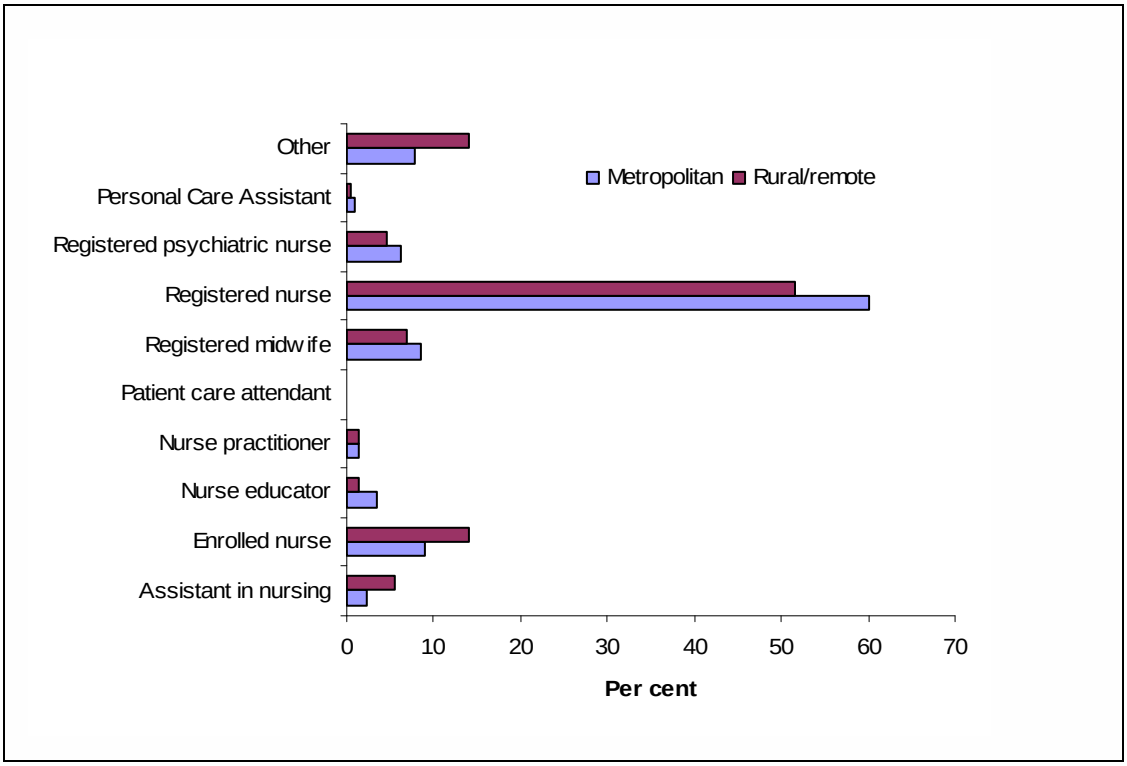

Figure 2. Current occupation by work location

Those working in rural or remote areas had more experience working in the nursing profession (mean of 14.7 years) compared to metropolitan nurses (mean of 13.3 years), although this is not statistically significant.

Just over half of the metropolitan nurses, 51.1%, worked full-time compared with 42.0% of rural/remote nurses. On the other hand, 52.9% of rural/remote nurses worked part-time or on a casual basis compared with 46.8% of metropolitan nurses (Figure 3).

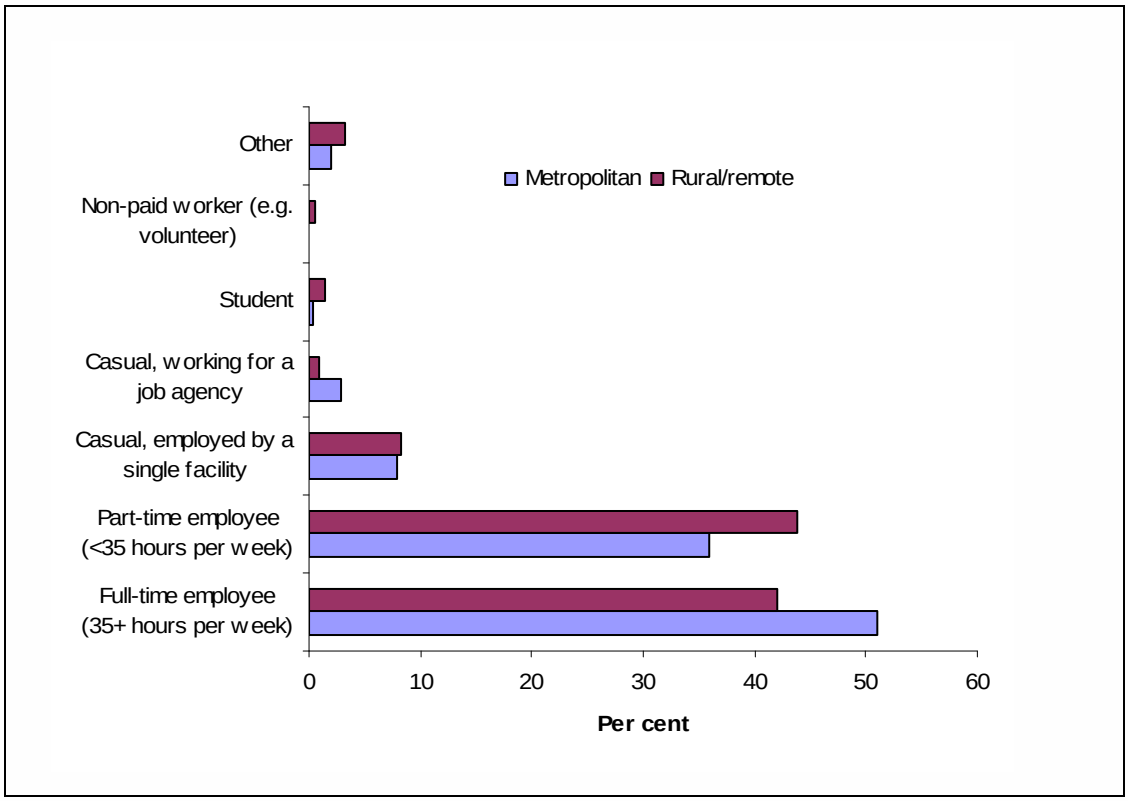

Figure 3. Employment status by work location

Workplace profile

Nurses working in rural or remote areas are more likely than metropolitan nurses to be working in small facilities, whereas metropolitan nurses are more likely than their rural/remote counterparts to be working in large facilities (Figure 4).

The data show that there are large differences in the main department or specialty areas that nurses work in, depending on whether they worked in a metropolitan or a rural/remote area. Table 2 presents the departments or specialty areas where the nurses spent any substantial time working in the seven days before taking part in the survey. The table is displayed in descending order in terms of the total number of respondents in the sample working within that particular department or specialty area. Most rural/remote nurses worked in acute care (59.8%) or aged care (46.1%). However, a significantly higher proportion of rural/remote nurses reported working in aged care or primary care compared with metropolitan nurses.

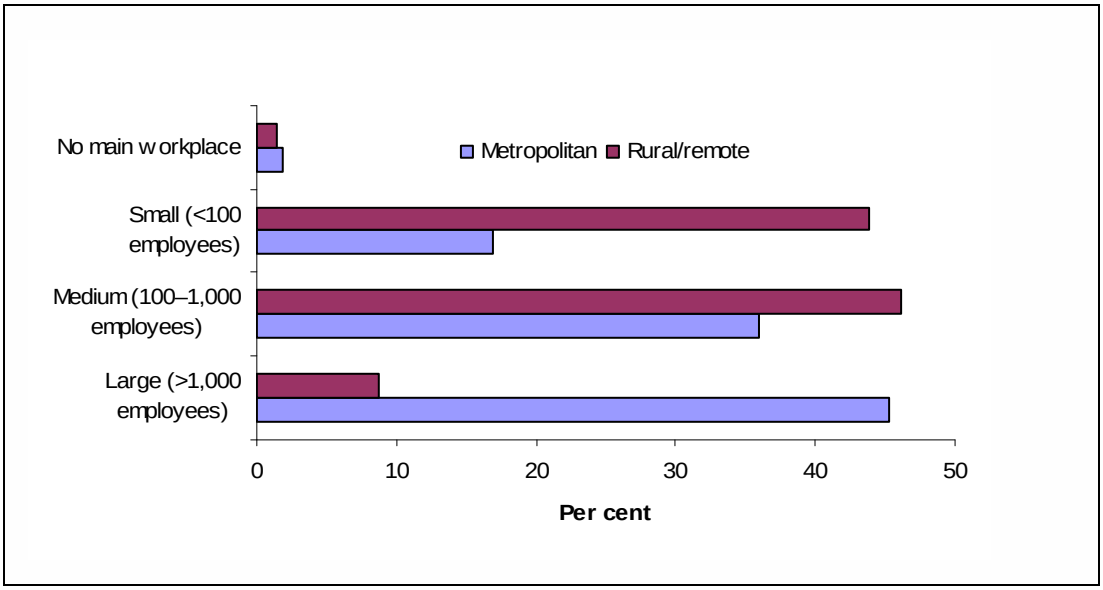

Figure 3. Workplace size by work location

Table 2. Departments or specialty areas of rural/remote and metropolitan nurses

	Work location (%)	
Main department / specialty area	**Metropolitan**	**Rural / remote**
Acute care	69.0	59.8
Other	34.8	38.4
Aged Care	18.8	46.1
Primary Care	11.3	25.1
Non-acute care	13.9	19.2
Mental Health	10.9	11.0

– Significantly different at $p < .05$ (using the Chi-squared test statistic).

Appendix B contains a more complete list of participants' departments and specialty areas. Rural/remote nurses were more likely than metropolitan nurses to be working in aged care, medical and emergency department areas, and community and palliative care; whereas, compared to their rural/remote counterparts, metropolitan nurses were more likely to be working in specialist areas.

Career prospects, job security and work-life balance

The survey included items regarding nurses' perception of their career prospects, job security and work-life balance in the workplace. Respondents were asked to indicate their level of agreement with 10 statements using a 4-point Likert scale (1='strongly disagree' to 4= 'strongly agree'). A higher score represents greater agreement with, or belief regarding, the statement.

Overall, many nurses do not believe they have good career prospects (Table 3). On the other hand, more than 75% believe that their job security is good. A high proportion of nurses in general also reported that tiredness affects their work-life balance.

Table 3. Career prospects, job security and work-life balance, by work location

Career prospect, job security or work-life balance statement	Work location (% 'agree/strongly agree')	
	Metropolitan	Rural / remote
My job security is good	83.3	75.8
My current occupational position adequately reflects my education and training	79.1	78.5
Considering all my efforts and achievements, I receive the respect I deserve	75.4	64.8
My family and/or friends **do not** dislike how often I am preoccupied with my work while I am at home*	64.7	53.4
I have **not** experienced or I do **not** expect to experience an undesirable change in my work situation*	61.1	59.4
My working hours are **not** so long that my work takes away from my personal interests*	57.1	53.9
I have good opportunities for promotion, increase in income, or professional development	53.8	40.6
My work **does not** take up time that I'd like to spend with family/friends*	45.1	43.8
Considering all my efforts and achievements, my salary/income is adequate	38.7	36.1
After work I **do not** come home too tired to do some of the things I'd like to do*	16.3	19.2

[ ] – Significantly different at $p < .05$ (Appendix E).

*For comparative purposes, statements phrased negatively in the survey have been reversed.

Rural/remote nurses were significantly more likely than metropolitan nurses to believe that their family and/or friends dislike how often they

are preoccupied with work while at home. They were also less likely than metropolitan nurses to believe that they have good opportunities for promotion, increase in income or professional development; and that they receive the respect they deserve. However, rural/remote nurses were less likely than metropolitan nurses to agree that they came home from work too tired to do some of the things they liked.

Chapter 4. Differences in occupational health and safety issues in the workplace

Chapter 4 highlights

- Rural/remote nurses are more likely than metropolitan nurses to perceive temperature extremes as a health risk.
- Rural/remote nurses are less likely than metropolitan nurse to perceive risks from bloodborne pathogens and noise levels.
- Rural/remote nurses are more likely to believe that they had been trained by their current employer in how to recognise and deal with potential incidents of workplace violence; that their work areas are periodically inspected to identify potential health and safety hazards; and that they know how to use safety equipment and standard work procedures.
- Rural/remote nurses are less likely to believe that managers and supervisors set proper examples by flowing safety rules and work practices and that the health and safety of workers is a major priority with top management.
- Rural/remote nurses are more likely than their metropolitan counterparts to report stress or psychological injury as a reason for taking time off work.
- Rural/remote nurses lift or transfer patients more often than their metropolitan counterparts, and are more likely to use mechanical lifting devices or gait belts when doing so.

Perceived level of risk from various workplace hazards

Respondents were asked to indicate the level of risk they perceive from 23 workplace health and safety hazards using a 5-point scale (1 = 'no risk' to 5 = 'high risk'). Among all respondents, workplace stress, lifting or repositioning heavy objects, needlesticks and other sharps, and prolonged standing were associated with the greatest perceived risk (Table 4).

Rural/remote nurses were significantly more likely than metropolitan nurses to perceive temperature extremes as a workplace hazard; and less likely to perceive bloodborne pathogens and noise levels as hazards.

Table 4. Perception of 'high risk' to workplace hazards, by work location

	Work location (% 'high risk')	
Workplace hazard	**Metropolitan**	**Rural/ remote**
Workplace stress	62.1	55.7
Lifting/repositioning heavy objects (including patients)	45.5	39.7
Needlesticks and other sharps	45.9	35.2
Prolonged standing	44.7	35.2
Bloodborne pathogens (e.g., HIV or hepatitis)	42.3	30.6
Violence at work (e.g., assaults, threats, etc.)	36.0	34.2
Repetitive hand, wrist, arm or shoulder motions	32.1	28.8
Latex allergens (e.g., from gloves)	32.2	26.9
Infectious disease agents (e.g., tuberculosis)	27.2	22.4
Slips, trips and falls	24.9	22.4
Temperature extremes	15.5	29.2
Other health safety issues	15.5	14.6
Noise level	14.1	12.3
Ionising radiation (e. g., X-rays, gamma rays, etc.)	12.1	8.7
Hazardous drugs (including antineoplastic agents)	10.9	8.2
Machine safety hazards (e. g., exposed moving parts, etc.)	10.3	6.8
Poor air quality (e. g., moulds cigarette smoke, vehicle exhaust)	9.2	8.7
Anaesthetic gases	7.9	7.3
Chemical agents in general (e. g., acids, caustics, solvents)	5.8	10.5
High level disinfectants (e. g., glutaraldehyde)	5.6	6.8
Smoke from lasers and electrosurgery devices	5.0	4.6
Non-ionising radiation (e. g., UV, microwaves, radio frequency, magnetic/electric fields, etc)	4.8	5.0
Sterilants (e. g., Ethyline oxide, hydrogen peroxide)	4.1	5.5
Acts of bioterrorism at work	3.4	4.1

– Significantly different at $p < .05$ (Appendix E).

Management and occupational health and safety

Participants were asked to indicate their agreement with 20 statements pertaining to the management of occupational health and safety in the workplace using a 4-point Likert scale (1 = 'strongly disagree' to 4 = 'strongly agree').

The issues causing most concern for all nurses are understaffed work areas, exposure to dangerous or risky situations and lack of training in dealing with workplace violence (Table 5).

Rural/remote nurses were significantly more likely than metropolitan nurses to believe that they had been trained by their current employer in how to recognise and deal with potential incidents of workplace violence; that their work areas are periodically inspected to identify potential health and safety hazards; and that they know how to use safety equipment and standard work procedures.

On the other hand, rural/remote nurses were less likely to believe that managers and supervisors set proper examples by flowing safety rules and work practices; and that the health and safety of workers is a major priority with top management.

Table 5. Management of OHS issues in the workplace, by work location

	Work location (% 'agree/ strongly agree')	
Management of OHS issues statement	**Metropolitan**	**Rural / remote**
I know how to reduce the risk of accidents and incidents in the workplace	98.2	99.5
I know how to use safety equipment and standard work procedures	95.9	98.6
Proper personal protective equipment is made readily available by my employer	86.5	89.5
I can report injuries to manager without worrying about how it will affect my departments safety record	84.9	82.6
I could talk to employer if I had a problem with violence or aggression in my workplace	83.6	81.3
I can report injuries to manager without worrying about how it will affect my job	81.3	82.2
I feel free to express concerns about health and safety conditions to management	79.2	77.2
The safety procedures and practices in this organisation are useful and effective	78.0	75.3

	Work location (% 'agree/ strongly agree')	
Management of OHS issues statement	**Metropolitan**	**Rural / remote**
I have received adequate training from my current employer to recognise health and safety hazards in my job	77.6	80.8
The health and safety of workers is a major priority with top management	76.6	71.2
Managers and supervisors set proper examples by following safety rules and work practices	75.7	70.3
Employees have sufficient access to workplace health and safety training programs	72.7	70.8
I usually have enough time to take safety precautions while completing my duties	68.8	72.1
I feel safe from work-related injury or illness in my current work environment	67.4	65.8
Work areas are periodically inspected to identify potential health and safety hazards	67.3	74.9
Unsafe working conditions are corrected in a reasonable time period	64.8	64.8
I am **not** often required to do a task that makes me feel like I might be at risk of getting hurt*	63.7	63.5
I have been trained by current employer in how to recognise and deal with potential incidents of workplace violence	54.8	66.7
People in my department or unit are **not** frequently exposed to dangerous or risky situations*	53.8	58.9
My work area is adequately staffed	44.3	43.8

– Significantly different at $p < .05$ (Appendix E).

*For comparative purposes, statements phrased negatively in the survey have been reversed so that all statements reflect a positive belief.

Current occupational hazards

The survey included questions relating to current occupational activities that may expose nurses to hazards or reduce their exposure to hazards (see Driscoll, 2008a). These questions relate to the following hazards:

- Workload
- Use of sharp instruments
- Handling hazardous material
- Heavy lifting.

Rural/remote nurses were significantly more likely to have lifted or transferred patients in the past seven days than were metropolitan nurses (Appendix C). Of the remaining items in this set, rural/remote and metropolitan nurses differed significantly on only two items, both relating to lifting or transferring patients (Table 6). That is, rural/remote nurses were more likely than metropolitan nurses to use mechanical lifting devices or gait belts (transfer belts) for lifting or transferring patients.

Table 6. Use of devices for lifting or transferring patients, by work location, past 7 days

Career prospect, job security or work-life balance statement	Work location (% 'most' or 'all' the time)	
	Metropolitan	Rural / remote
Lift or move by hand (unassisted)	24.9	20.0
Mechanical lifting device	18.6	38.1
Slip or reduction sheets	37.8	43.6
Gait belts (transfer belts)	6.7	16.4
Back belts	2.7	6.6
Lifting assistance from 1 or more co-workers	49.3	50.3
Roller or slider boards	24.5	24.2

[ ] – Significantly different at $p < .05$ (Appendix E).

Chapter 5. Workplace stress in rural and metropolitan nurses

Chapter 5 highlights

- Rural/remote nurses do not differ from metropolitan nurses in self-rated level of stress or fatigue
- Rural/remote nurses report less support from their colleagues than do metropolitan nurses.

Perceived stress and fatigue

As shown in Table 4 above, workplace stress was the only hazard perceived by more than half the participants, regardless of work location. Participants were also asked to rate their level of general stress and fatigue experienced during the past 7 days using a using a 5-point scale (1 = 'extremely low' to 5 = 'extremely high'). On average, participants rate their stress and fatigue levels to be slightly more than the midpoint of the scale (Table 7). There were no significant differences between rural/remote and metropolitan nurses on either variable.

Table 7. Rating of general stress and fatigue, by work location, past 7 days

	Work location (mean rating)	
Variable	Metropolitan	Rural / remote
General level of stress	3.13	3.12
General level of fatigue	3.40	3.45

Psychosocial risk factors for workplace stress

The survey included items addressing underlying risk to workplace stress factors. These items were based on the job-demand-control-support model (JDCS model) by Karasek and Theorell (1990), an extension of the job-demand-control model (JDC model) originally established by Karasek (1979). There is evidence that factors outlined in the JCDS model are associated with a number of adverse health outcomes.

The most widely studied effect of psychosocial work environment is the effect on cardiovascular disease (CVD) and associated risk factors, including blood pressure and smoking behaviour (Green & Johnson, 1990; Hintasen et al., 2005; Schnall, Landsbergis & Baker, 1994; Theorell et al. 1991). In a review of studies on cardiovascular risk,

Schnall et al. (1994) reported that positive associations were found between job strain, cardiovascular disease and mortality (either CVD or non-CVD related). In a more recent review, Belkic et al. (2004) found that among longitudinal studies reviewed, 47% reported significant positive findings of association between job strain and cardiovascular risk. Among case control studies, 67% reported positive findings and 50% of cross-sectional studies also had positive significant results.

A recent systematic review of the literature on the association between psychosocial work stressors and mental ill health found that low decision authority, low decision latitude, high job demand, low occupational social support and job insecurity are associated with moderate risk of common mental disorders (Stansfeld & Candy, 2006).

The survey conducted for the present study contained items measuring five distinct aspects of the JCDS model:

- Skill discretion (control)
- Authority (control)
- Low demand (demand)
- Supervisor support (support)
- Colleague support (support).

For each of these constructs, respondents were asked to respond to statements using a 4-point Likert scale (1 = ‘strongly agree’ to 4 = ‘strongly disagree’).

Participants generally agreed to positive statements regarding skill discretion, authority, supervisor support and colleague support (Table 8). Appendix D contains a complete list of items in each construct.

Limitations

The survey uses the question “Where is your workplace located: metropolitan (city or major town) or rural/remote?” to determine nurses workplace location.

Since the collection of this data, the Australian Institute of Health and Welfare (AIHW) and others have highlighted the importance of identifying both inner and outer regional areas as well as metropolitan and remote/very remote areas when access to services may be an underlying issue. A limitation of this study therefore is the potential for a lack of sensitivity in this research. In future studies therefore we recommend the AIHW location question be used.

Table 8. Average agreement with the five psychosocial construct statements

	Work location (mean % 'agree/strongly agree')	
Psychosocial construct	**Metropolitan**	**Rural / remote**
Skill discretion	85	86
Authority	69	71
Low demand	42	40
Supervisor support	75	69
Colleague support	88	81

– Significantly different at $p < .05$ (Appendix E).

After controlling for the influence of the other psychosocial constructs, 'colleague support' alone significantly distinguished between rural/remote and metropolitan nurses (Appendix E). That is, when considering nurses who have the same level of control, demand and supervisor support, those with lower colleague support are more likely to work in a rural or remote area.

Chapter 6. Conclusions

The national survey identified statistically significant differences in the perceived occupational hazards for nurses in rural and remote areas, compared to their metropolitan counterparts, which largely reflect differences in nurses' occupational and workplace profiles. These findings will be informative for OHS policy development and implementation.

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Appendix A: Summary of main differences between rural/remote and metropolitan nurses

	Work location	
	Metropolitan	**Rural / remote**
Number in sample	736	219
Proportion of sample	77.1%	22.9%
Demographics		
Gender	16.2% male	8.7% male
Age	Mean = 43.4 yrs	Mean = 46.2 yrs
Occupation		
Registered nurse	60.2%	51.6%
Experience	Mean = 13.3 yrs	Mean = 14.7 yrs
Full time	51.1%	42.0%
Part time or casual	46.8%	52.9%
Workplace		
Large workplace	45.2%	8.7%
Small workplace	16.8%	43.8%
Departments or specialty areas worked in.	1. Acute care (69.0%) 2. Other (34.8%) 3. Aged Care (16.8%)	1. Acute care (59.8%) 2. Aged care (46.1%) 3. Other (38.4%)
Significantly greater proportion of nurses working in this department or specialty area than comparison workplace	Surgical (12.5%), intensive care (6.3%), cardiology (4.2%), neurology (3.9%), gastroenterology (3.7%)	Aged care (46.1%), medical (22.4%), emergency (19.2%), community (17.8%), palliative care (16.4%), general practice (8.2%), outpatients (9.6%), pathology/cannulation (6.8%)
Career statements associated with workplace (Odds ratio from logistic regression)	• Have good opportunities for promotion, increase in income or professional development (OR = 1.61) • Considering all their efforts and achievements they receive the respect they deserve (OR = 1.42) • After work they come home too tired to do some of the things they would like to do (OR = 1.62)	• Current position adequately reflects their education and training (OR = 1.44*) • Their family and/or friends dislike how often they are preoccupied with their work while they are at home (OR = 1.60)
Estimated levels of risk		
Top 3 worst perceived risks (% indicating 'high risk')	1. Workplace stress (62.1%) 2. Needlesticks and other sharps (45.9%) 3. Lifting / repositioning heavy objects (45.5%)	1. Workplace stress (55.7%) 2. Lifting / repositioning heavy objects (39.7%) 3. Needlesticks and other sharps (35.2%)
Perceived risks associated with workplace (Odds ratio from logistic regression)	Bloodborne pathogens (OR = 1.28) Noise levels (OR = 1.23)	Temperature extremes (OR = 1.54)

	Workplace location	
	Metropolitan	**Rural / remote**
Management and OHS		
Top 3 worst performing management areas (% of disagreement)	1. Work area is adequately staffed (56%) 2. People in department or unit are not frequently exposed to dangerous or risky situations (46%) 3. Have been trained by current employer in how to recognise and deal with potential incidents of workplace violence (45%)	1. Work area is adequately staffed (56%) 2. People in department or unit are not frequently exposed to dangerous or risky situations (41%) 3. Not often required to do a task that makes them feel like they might be at risk of getting hurt (37%)
Management areas associated with workplace (Odds ratio from logistic regression)	▪ The health and safety of workers is a major priority with top management (OR = 1.57) ▪ Managers and supervisors set proper examples by following safety rules and work practices (OR = 1.64)	▪ I know how to use safety equipment and standard work procedures (OR = 3.43) ▪ Work areas are periodically inspected to identify potential health and safety hazards (OR = 1.61) ▪ I have been trained by my current employer in how to recognise and deal with potential incidents of workplace violence (OR = 1.77)
Injuries or diseases sustained		
Suffered a workplace injury or disease from nursing which required time off work	50.7%	53.0%
Top 3 injuries or diseases requiring time off work (%nurses taking time off work)	1. Musculoskeletal disease / injury (36.5%) 2. Stress, psychological injury (9.0%) 3. Bullying, violence (7.6%)	1. Musculoskeletal disease / injury (34.7%) 2. Stress, psychological injury (14.2%) 3. Bullying, violence (8.2%)
Significantly greater proportion of nurses requiring time off work due to this injury or disease than comparison group	–	Stress, psychological injury (OR = 1..67)
Occupational stress		
Number of days taken off work due to stress or psychological injury (Median)	14 days	28 days
Psychosocial factors predictive of workplace (Odds ratio from logistic regression)	–	Colleague support (OR = 3.06)
Percentage classified in the relatively higher strain profile – low control and support, high demand	17.4%	19.6%

*Odds ratio significant at the 5% level of statistical significance.

Appendix B: Nurses' departments and specialty areas

Table B1 displays the proportion of nurses working in particular departments or specialty areas in the seven days before taking part in the survey. Significant differences between rural or remote and metropolitan nurses have been highlighted.

Table B1. Participants' main department or specialty area, by work location

		Work location (%)	
Main department / specialty area	Number	Metropolitan	Rural / remote
Aged Care	239	18.8	46.1
Administration	190	19.2	22.4
Medical	149	13.6	22.4
Clinical education	140	14.3	16.0
Surgical	108	12.5	7.3
Mental Health	104	10.9	11.0
Emergency	102	8.2	19.2
Community	100	8.3	17.8
Midwifery	98	10.2	10.5
Pre/post graduate education	90	9.0	11.0
Palliative Care	85	6.7	16.4
Rehabilitation	73	7.2	9.1
Perioperative	66	6.7	7.8
Postoperative	63	6.5	6.8
Occupational health and safety	59	5.8	7.3
Oncology	58	6.5	4.6
Paediatrics	54	6.4	3.2
Research	49	5.0	5.5
Intensive care	49	6.3	1.4
Human resources	48	4.5	6.8
Critical Care	44	5.3	2.3
Drug and alcohol abuse	44	4.3	5.5
Orthopaedics	43	4.1	5.9
General Practice	41	3.1	8.2
Infectious disease	41	4.3	4.1
Outpatients	41	2.7	9.6
Day Surgery	35	3.3	5.0
Respiratory	33	3.1	4.6
Cardiology	32	4.2	0.5
Coronary Care	31	3.7	1.8
Neurology	30	3.9	0.5
Pathology/cannulation	29	1.9	6.8
Gastroenterology	28	3.7	0.5

Main department / specialty area	Number	Work location (%)	
		Metropolitan	Rural / remote
Anaesthetics	27	2.7	3.2
Renal	22	2.3	2.3
Haematology	22	2.6	1.4
Sexual Health	17	1.4	3.2
Ear nose and throat	15	1.8	0.9
Spinal Cord Injury	14	1.8	0.5
Endocrinology	13	1.6	0.5
Radiology	13	1.6	0.5
Blood bank	10	1.2	0.5
Thoracic	6	0.7	0.5
Immunology	5	0.5	0.5
Sleep disorders	5	0.4	0.9
Dermatology	4	0.5	0.0
Nuclear Medicine	4	0.5	0.0
Rheumatology	3	0.4	0.0
Urology	0	0.0	0.0
Other	0	0.0	0.0

*- Significantly greater proportion of **metropolitan** nurses working within this main department or specialty area at the 5% level of significance.*

*- Significantly greater proportion of **rural or remote** nurses working within this main department or specialty area at the 5% level of significance.*

A greater proportion of **rural nurses** were found in a number of department or specialty areas:

- aged care (46.1%), approximately 2.5 times that of metropolitan nurses;
- medical department areas (22.4%), approximately 1.6 times that of metropolitan nurses;
- emergency department areas (19.2%), 2.3 times that of metropolitan nurses;
- community care (17.2%), 2.1 times that of metropolitan nurses;
- palliative care (16.4%), 2.4 times that of metropolitan nurses;
- outpatients (9.6%), 3.6 times that of metropolitan nurses;
- general practice (8.2%), 2.6 times that of metropolitan nurses; and
- pathology or cannulation (6.8%), 3.6 times that of metropolitan nurses.

A greater proportion of **metropolitan nurses** were found in some department or specialty areas:

- surgical (12.5%), approximately 1.7 times that of rural/remote nurses;

- intensive care (6.3%), approximately 4.5 times that of rural/remote nurses;
- cardiology (4.2%), approximately 8.4 times that of rural/remote nurses;
- neurology (3.9%), approximately 7.8 times that of rural/remote nurses; and
- gastroenterology (3.7%), approximately 7.4 times that of rural/remote nurses.

Appendix C: Current exposure to occupational hazards

Table C1. Summary of specific hazardous activities, by work location

	Work location	
Hazard group	**Metropolitan**	**Rural/remote**
Workload in past 7 days		
Number of days worked	Mean = 4.0 days	Mean = 4.2 days
Number of hours scheduled	Mean = 32.7 hrs	Mean = 32.3 hrs
Number of hours worked	Mean = 35.0 hrs	Mean = 34.5 hrs
Number of hours worked in past 7 days typical	Yes = 72.6%	Yes = 73.5%
Sharp instruments		
Use or handle syringes, scalpels or other sharp instruments.	Yes = 85.1%	Yes = 85.8%
Perform procedures with sharp instruments	Yes = 78.9%	Yes = 77.2%
Use safe needle devices for procedures	Yes = 71.6%	Yes = 69.8%
Frequency of using safe needle devices for procedures	Always = 46.6%	Always = 53.4%
Hazardous material		
Handle bed pans, sheets, clothing, etc. soiled with blood, urine, faeces or vomit	Yes = 86.4%	Yes = 89.0%
Trained to follow universal precautions when handling soiled materials	Yes = 92.0%	Yes = 94.4%
Number of times handled soiled materials in past 7 days	>20 = 33.9%	>20 = 32.8%
Number of times handled soiled materials in past 7 days normal	Yes = 82.5%	Yes = 81.5%
Frequency of wearing protective gown while handling soiled material in past 7 days	Always = 10.8%	Always = 6.7%
Frequency of wearing protective gloves while handling soiled material in past 7 days	Always = 66.7%	Always = 65.6%
Wore powder-free natural latex gloves in past 7 days	Yes = 58.2%	Yes = 53.9%
Wore powdered natural latex gloves in past 7 days	Yes = 19.8%	Yes = 23.3%
Administer antineoplastic agents	Yes = 18.8%	Yes = 18.7%
Use ethylene oxide or hydrogen peroxide plasma	Yes = 2.7%	Yes = 3.2%
Use high level disinfectants	Yes = 11.7%	Yes = 10.0%
Heavy lifting in past 7 days		
Number of times lifted/transferred patients	>20 = 18.4%	>20 = 26.5%
Frequency of using lifting devices for patients		
– lift or move by hand (unassisted)	Most/all time = 24.9%	Most/all time = 20.0%
– mechanical lifting device	Most/all time = 18.6%	Most/all time = 38.1%
– slip or reduction sheets	Most/all time = 37.8%	Most/all time = 43.6%
– gait belts (transfer belts)	Most/all time = 6.7%	Most/all time = 16.4%
– back belts	Most/all time = 2.7%	Most/all time = 6.6%
– assistance from co-workers	Most/all time = 49.3%	Most/all time = 50.3%
– roller or slider boards	Most/all time = 24.5%	Most/all time = 24.2%
Number of times lifted/moved heavy objects	>20 = 10.3%	>20 = 14.7%
Frequency of using lifting devices for objects		
– lift or move by hand	Always = 20.9%	Always = 22.8%
– mechanical lifting device	Not available = 19.8%	Not available = 18.7%
– roller or slider boards	Not available = 14.7%	Not available = 15.5%
– back belts	Not available = 21.7%	Not available = 21.5%
– assistance from co-workers	Always = 7.5%	Always = 8.2%

Appendix D: Psychosocial risk factors

Table D1. Agreement with psychosocial risk factor statements

		Work location (%)	
Construct	**Psychosocial risk factor statement**	**Metropolitan**	**Rural / remote**
Skill discretion (control)	My job requires I learn new things	95.1	91.8
	My job does **not** involve a lot of repetitive work*	19.6	23.7
	My job requires me to be creative	75.1	80.8
	My job requires a high level of skill	93.9	95.0
	I get to do a variety of different things on their job	86.5	86.3
	I have an opportunity to develop my own special abilities	73.4	74.0
Authority (control)	My job allows them to make a lot of decisions on my own	76.9	79.5
	On my job, I **don't** have very little freedom to decide how to do my work*	75.8	76.3
	I have a lot of say about what happens on my job	55.6	58.0
Low demand (demand)	My job does **not** require working very fast*	28.8	29.7
	My job does **not** require working very hard*	13.3	15.1
	I am not asked to do an excessive amount of work	43.6	38.8
	I have enough time to get the job done	45.5	38.4
	Some demands I face at work are **not** in conflict with other demands at work*	30.3	32.4
	My job requires a great deal of concentration	92.8	87.2
Supervisor support (support)	My supervisor is concerned about welfare of those under his or her supervision	73.8	67.1
	My supervisor pays attention to what I am saying	79.1	73.1
	My supervisor is helpful in getting the job done	71.2	68.5
	My supervisor is successful in getting people to work together	66.6	55.3
	My supervisor considers my viewpoint	79.1	76.3
	My supervisor is able to suppress personal biases	65.9	60.3
	My supervisor treats me with kindness and consideration	82.7	79.0
	My supervisor takes steps to deal with me in a truthful manner	81.7	74.9
Colleague support (support)	People I work with are competent in doing their job	86.3	74.0
	People I work with take a personal interest in me	82.3	75.3
	People I work with are friendly	94.3	91.8
	People I work with are helpful in getting the job done	90.5	83.1

*These statements were phrased in reverse manner in the original survey.

Appendix E: Logistic regression results

Unless otherwise noted in the text, statistically significant differences between rural/remote and metropolitan nurses were revealed by logistic regression analysis. The following tables contain logistic regression output for variables ('predictors') resulting in differences at the 5% ($p < .05$) level of statistical significance.

Table E1. Logistic regression of work location on perceived career prospects, job security and work-life balance

				95% CI for OR	
Significant predictor	**B**	**SE**	**OR**	**Lower**	**Upper**
I have good opportunities for promotion, increase in income, or professional development	-.478	.173	.620	.442	.870
Considering all my efforts and achievements, I receive the respect I deserve	-.389	.192	.678	.465	.987
After work I come don't home too tired to do some of the things I'd like to do	.479	.213	1.615	1.063	2.453
My family and /or friends do not dislike how often I am preoccupied with my work while I am at home	-.470	.169	.625	.448	.871

Note. B = regression coefficient, SE = standard error, OR = odds ratio; CI = confidence interval.

Table E2. Logistic regression of work location on perceived risk from workplace hazards

				95% CI for OR	
Significant predictor	**B**	**SE**	**OR**	**Lower**	**Upper**
Bloodborne pathogens (e.g. HIV or hepatitis)	-.245	.077	.783	.673	.910
Latex allergens (e.g. from gloves)	-.138	.070	.871	.759	.999
Temperature extremes	.431	.072	1.538	1.335	1.772
Noise level	-.211	.089	.810	.681	.963

Note. B = regression coefficient, SE = standard error, OR = odds ratio; CI = confidence interval.

Table E3. Logistic regression of work location on perceived management of occupational health and safety

				95% CI for OR	
Significant predictor	**B**	**SE**	**OR**	**Lower**	**Upper**
The health and safety of workers is a major priority with top management	-.451	.201	.637	.429	.945
Managers and supervisors set proper examples by following safety rules and work practices	-.495	.202	.610	.410	.906
I know how to use safety equipment and standard work procedures	1.232	.623	3.426	1.011	11.615
Work areas are periodically inspected to identify potential health and safety hazards	.477	.200	1.612	1.090	2.383
I have been trained by my current employer in how to recognise and deal with potential incidents of workplace violence	.571	.174	1.770	1.257	2.491

Note. B = regression coefficient, SE = standard error, OR = odds ratio; CI = confidence interval.

Table E4. Logistic regression of work location on use of devices for lifting or transferring patients

				95% CI for OR	
Significant predictor	**B**	**SE**	**OR**	**Lower**	**Upper**
Use of mechanical lifting device	.263	.095	1.301	1.080	1.568
Gait belts (transfer belts)	.450	.168	1.568	1.128	2.181

Note. B = regression coefficient, SE = standard error, OR = odds ratio; CI = confidence interval.

Table E5. Logistic regression of work location on psychosocial risk factors

				95% CI for OR	
Significant predictor	**B**	**SE**	**OR**	**Lower**	**Upper**
Colleague support	-1.118	.314	.327	.177	.606

Note. B = regression coefficient, SE = standard error, OR = odds ratio; CI = confidence interval.