

**Centre for International Health  
Division of Health Sciences**

**Occupational injury, disease and stress  
in the veterinary profession**

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**This thesis is presented for the Degree of  
Doctor of Philosophy  
of  
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## DECLARATION

To the best of my knowledge and belief, this thesis does not contain any material written or published by another person except where due acknowledgement has been made.

This thesis contains no material, which has been accepted for the award of any other degree or diploma in any university.

Signed

Date

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Deficiencies in this thesis are all my own. I cannot blame others for my shortcomings. I hope that the outcome of this study will be of benefit to the veterinary profession.

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## ABSTRACT

Scant attention has been given to occupational health hazards of Australian veterinarians. This study aimed to identify the major risk factors for occupational injury and disease, emotional health and suicide rates of veterinarians.

Qualitative in-depth interviews with 45 veterinarians were carried out which revealed that a significant proportion of veterinarians were both injured, stressed and had incurred zoonotic diseases.

Data linkage of the names of registered veterinarians in Western Australia with four Health Department of Western Australia databases was undertaken to provide supportive statistics on the conditions identified as being important in the interviews. The results of this latter analysis were inconclusive.

Therefore a self-administered questionnaire was developed, which collected quantitative data on injuries, disease, stress and risk factors from 419 veterinarians. Since the in-depth interviews had identified stress and suicide ideation as being very significant for many of those interviewed, the Kessler 10+ scale for measuring psychological distress was included in the self-administered questionnaire.

The data linkage was unable to provide accurate data about numbers of deaths of veterinarians and the records of coroners in Victoria and Western Australia which provided data on 89 veterinarians, were analysed to determine suicide rates.

Despite the interviews providing considerable information about rates and risk factors for injuries, disease and stress, no statistical analyses were undertaken because they provided insufficient data for quantitative analyses.

Nevertheless, statistics derived from the morbidity database using data-linkage, will be useful in comparing injuries in any future studies of this type.

Data collected from the self-administered questionnaire were subjected to Chi-square, and non-parametric tests and logistic regression analyses using multiple imputation for missing values.

Age-standardised and age-specific rates (ASR) were calculated for data on suicide in veterinarians derived from coroners' records obtained from Western Australia and Victoria using the Rates Calculator developed by Codde.<sup>1</sup>

The interviews and the survey of 464 veterinarians showed that a significant proportion of veterinarians incurred injuries and zoonotic diseases, and were highly stressed and distressed.

The interviews showed that a significant proportion of veterinarians expected to be injured and/or contract zoonotic diseases. It is suggested that this acceptance may, in part, account for the number of injuries that occur. Some of these injuries, especially in mixed animal veterinarians, may be attributable to poor facilities on farms and a lack of competent support in restraint of animals. There needs to be a cultural change with regard to safety if injury is to be reduced.

Using the Chi-squared analyses of the survey data, *injury* was associated with several risk factors including being a practice owner and being in mixed animal practice, being younger and with having taken drugs such as marijuana in the past 12 months. When all these variables were input into a logistic regression model, several of these risk factors were eliminated providing only three risk factors as predictors of injury. These were: having a back injury; taking drugs in the previous 12 months; and being between 35 and 54 years of age. Having high distress levels was not a predictor for injury.

Analyses of responses to the K10+ scale in the self-administered questionnaire revealed that the proportion of highly distressed respondents was double that of the Western Australian, New South Wales and Australian general populations which supports the findings from the interviews. Logistic regression provided three predictors for *distress*: being less than 35 years of age, having taken drugs in the past 12 months, and having a back injury, however having other workplace injuries was not a predictor.

The findings that the suicide rate in this study was about four times that of the general Australian adult population, should be of major concern and signal that there may be factors specific to the veterinary profession that account for this high rate.

This study has shown that there are high levels of psychological distress in veterinarians, especially practitioners, which suggests that veterinary practice may, in itself, be a stressful occupation. However, it may also be that some individuals with a predilection for distress, are being recruited into the veterinary profession. Better selection techniques for recruiting veterinary students using an aptitude test as well as interviews, could identify those who were unsuited for becoming veterinarians or who required additional mentoring and support upon graduation. This could reduce stress, distress and suicide in the veterinary profession.

Overall, 17 recommendations were made directed at improving the quality of data collection to obtain more reliable statistical outcomes, and suggesting ways of reducing injury, distress and zoonotic disease in veterinarians.

# TABLE OF CONTENTS

Declaration	i
Acknowledgements	ii
Abstract	iii
Table of contents	vi
List of tables	xi
List of figures	xv
Glossary	xvi
Chapter 1:Introduction	1
1.1 Background to the study	1
1.2 Research aim and objectives	5
1.2.1 Objective 1	5
1.2.2 Objective 2	5
1.2.3 Objective 3	5
1.2.4 Objective 4	5
1.2.5 Objective 5	5
1.2.6 Objective 6	6
1.2.7 Objective 7	6
1.2.8 Objective 8	6
1.3 Significance of the study	7
1.4 Organisation of the thesis	7
Chapter 2: Literature Review	8
2.1 Demographic information	11
2.1.1 Number and distribution of veterinarians	11
2.1.2 Gender	12
2.1.3 Hours worked	14
2.1.4 Social marital status	16
2.2 History: occupational injury and disease	16
2.3 Accuracy of records	19
2.4 Injury definition	19

2.5	Statistics	20
2.6	Injury rates	21
2.7	Types of Injury	22
2.8	Risk factors	25
2.9	Classification of occupational hazards	25
2.9.1	Physical injuries	28
2.9.2	Chemical injuries	38
2.9.3	Biological causes of disease	39
2.9.4	Cancers	44
2.10	Female veterinarians	45
2.11	Summary of shortfalls in studies	47
2.12	Emotional health	47
2.12.1	Stress	48
2.12.2	Assessment of emotional health	54
2.12.3	Mental health	55
2.13	Causes of death of veterinarians	56
2.14	Suicide	57
2.14.1	Suicide in the general population	59
2.14.2	Suicide in veterinarians and related professions	62
2.14.3	Method of suicide	64
2.15	Research methodologies for studies	65
2.15.1	Use of interviews	67
2.15.2	Triangulation of data	68
2.16	Conclusion	69
Chapter 3: Research Design and Methodology		70
3.1	Introduction	70
3.2	Phase 1: In-depth interviews	72
3.2.1	Study sample	72
3.2.2	Data gathering	73
3.3	Phase 2: Data linkage	75
3.3.1	Mental Health Information System (MHIS)	76
3.3.2	Hospital Morbidity Data System (HMDS)	76
3.3.3	Cancer Registry	76
3.3.4	Death records	76
3.3.5	Process	76



3.4	Phase 3: Self-administered questionnaire	78
3.4.1	Study sample	79
3.4.2	Questionnaire	79
3.4.3	Process of data gathering	81
3.5	Phase 4: Death records	82
3.6	Data analysis	82
3.7	Ethical Considerations for all phases	83
3.8	Summary of research design and methodology	84
Chapter 4:Results Phase 1		85
4.1	Demographics	87
4.2	Career choice	94
4.3	Injury	95
4.3.1	Subjects working with case mix of animals	95
4.3.2	Injuries from small animals	97
4.3.3	Injuries from large animals	102
4.3.4	Chronic injuries from repetitive activities	116
4.3.5	Motor vehicle and aircraft accidents.	120
4.3.6	Needle-puncture injuries	121
4.3.7	Injuries in general	122
4.4	Zoonoses	123
4.4.1	Q fever	124
4.4.2	Brucellosis	126
4.4.3	Leptospirosis	127
4.4.4	Psittacosis	129
4.4.5	Other zoonoses	129
4.5	Allergies	130
4.6	Emotional health	131
4.7	Suicide	137
4.8	Summary	139
Chapter 5:Results Phases 2 - 4		142
5.1	Phase 2: Database linkage study	142
5.1.1	Mental health	142
5.1.2	Cancer	143

5.1.3	Morbidity	143
5.1.4	Death database	145
5.1.5	Summary of records obtained by data linkage	145
5.2	Phase 3 - Self administered questionnaire	146
5.2.1	Introduction	146
5.2.2	Demographic information	146
5.2.3	Employment Factors	148
5.2.4	Career choice	157
5.2.5	Likelihood of remaining a veterinarian	158
5.2.6	Happiness	160
5.2.7	Routine medical checks	162
5.2.8	Risk taking	164
5.2.9	Anger	164
5.2.10	Substance use	165
5.3	Occupational Injuries	167
5.3.1	Major workplace injuries requiring time off work	167
5.3.2	Injury, age and gender	168
5.3.3	Injury and marital status	169
5.3.4	Injury and practice ownership	169
5.3.5	Injury and case mix of animals	169
5.3.6	Injury and hours worked	171
5.3.7	Injury and years worked	172
5.3.8	Injury and risk taking	172
5.3.9	Injury and substance use	173
5.3.10	Injury and job satisfaction	174
5.3.11	Injury types	175
5.3.12	Treatment of injuries	176
5.3.13	Back injuries	176
5.3.14	Repetitive strain injuries	179
5.3.15	Number of motor vehicle accidents and injuries	180
5.3.16	Summary of risk factors for injury using $\chi^2$	180
5.3.17	Logistic regression for injury	181
5.4	Zoonoses	182
5.5	Female respondents	184
5.6	Emotional health	185
5.6.1	Psychological distress	185
5.6.2	Distress levels by age, gender and employment	186
5.6.3	Responses to extra questions on K10+ scale	191
5.6.4	Distress levels and social marital status	192
5.6.5	Distress levels and hours worked per week	193
5.6.6	Distress and total number of years worked	195

5.6.7	Distress and case mix of animals	196
5.6.8	Distress and injury	196
5.6.9	Distress and back injury	197
5.6.10	Distress and substance use.	197
5.6.11	Distress and anger	199
5.6.12	Distress and happiness	200
5.6.13	Distress and job satisfaction	200
5.6.14	Distress and zoonoses	201
5.6.15	Stressors and coping strategies	201
5.6.16	Logistic regression	203
5.6.17	Summary of variables affecting distress	204
5.7	Phase 4: Determination of causes of death	205
5.7.1	Causes of death of veterinarians	205
5.8	Summary	211
Chapter 6 Discussion and Recommendations		212
6.1	Introduction	212
6.2	Injuries	213
6.2.1	Types of injuries	214
6.2.2	Risk factors for injuries	216
6.2.3	Reducing risks	219
6.2.4	Treatment of injuries	221
6.2.5	Inconsistencies in results	222
6.3	Occupational zoonoses	222
6.3.1	Types of zoonoses	222
6.3.2	Risk factors for zoonoses	223
6.4	Emotional health	224
6.4.1	Possible risk factors for stress and distress	224
6.4.2	Other emotional health indicators	228
6.4.3	Stressors and coping strategies for stress	230
6.4.4	Distress and mental health	233
6.5	Suicide	236
6.5.1	Reduction of suicide	237
6.6	Summary	238
7	References	240
8	Endnotes	252

## Appendices

Appendix A:	Veterinary Surgeons Board survey	255
Appendix B:	Pre- interview questionnaire	271
Appendix C:	Selected narrative accounts	274
Appendix D:	Letters to veterinarians	353
Appendix E:	Self-administered questionnaire	356
Appendix F:	Datalinkage results-Cancer Register	365
Appendix G:	Data linkage results – HMDS	367
Appendix H	Job satisfaction scores - 5 point scale	369
Appendix I:	Logistic regression model	371

## LIST OF TABLES

Table 2-1	Gender of veterinarians in Western Australia	13
Table 2-2	Workers' Compensation claims by veterinary practices in WA 1991-1995	22
Table 2-3	Injuries in Australian cattle veterinarians	23
Table 2-4	Injuries by pregnancy testing and injury	24
Table 2-5	AAHA Workers' Compensation Losses 1993-94	28
Table 2-6	Animal-related injuries in zoo veterinarians	29
Table 2-7	Workplace injuries by animal species for four studies	32
Table 2-8	Exposure to specific agents from needle punctures	34
Table 2-9	Zoonoses contracted by South African veterinarians	40
Table 2-10	Hours by ability to balance work & personal life	53
Table 4-1	Age profile of subjects by gender	87
Table 4-2	Summary of subjects' injuries, zoonoses, perceived stress and suicidal thoughts	88
Table 4-3	Injuries and diseases incurred from large and small animals	94
Table 4-4	Percentage of subjects working with case mix	95
Table 4-5	Perceived stress and suicidal thoughts by case mix of animals	96
Table 4-6	Acute and chronic injuries from small and large animals	96
Table 4-7	Types of injuries incurred by subjects from large animals	103
Table 4-8	Risk factors for injuries from working with small animals	139
Table 4-9	Risk factors for injuries from large animals and zoonoses	140
Table 4-10	Summary of risk factors for subjects' stress	140
Table 4-11	Risk factors as to why veterinarians commit suicide	141
Table 5-1	Summary of Mental Health records from MHIS and HMDS	142
Table 5-2	Occupational disease and injury (HMDS records)	143
Table 5-3	Summary of data outputs from Phase 2 stages	145
Table 5-4	Reasons for not working as veterinarians by gender	148
Table 5-5	Marital status of respondents by age and gender	148
Table 5-6	Type of employment of respondents	149
Table 5-7	Animal species in case load	149

Table 5-8	Percentage of veterinarians working with case mix of animals	150
Table 5-9	Average hours worked per week by gender	151
Table 5-10	Average hours worked per week by case mix by gender	152
Table 5-11	Working < or > 40 hours per week by case mix and gender	153
Table 5-12	Effect of after-hours duty on sleep by gender	154
Table 5-13	Effect of after-hours duty on sleep by age	154
Table 5-14	After-hours work effect on sleep by case mix	154
Table 5-15	Perceived effect of after-hours duty on energy levels by gender	155
Table 5-16	Effect of after-hours duty on energy levels by age group	155
Table 5-17	Effect of after-hours duty on family life by gender	156
Table 5-18	Effect of after-hours work on family life by age	156
Table 5-19	Job satisfaction	157
Table 5-20	Likelihood of remaining a veterinarian	158
Table 5-21	Likelihood of remaining a veterinarian in 5 years by age	158
Table 5-22	Likelihood of remaining a veterinarian by job satisfaction	159
Table 5-23	When last routine preventive medical check-up occurred	162
Table 5-24	Frequency of routine medical check-ups	162
Table 5-25	Age group by frequency of check-ups	163
Table 5-26	Frequency of medical check-up by age group and gender	163
Table 5-27	Risk taking when first graduated and now	164
Table 5-28	Anger frequency	164
Table 5-29	Injury by anger frequency	165
Table 5-30	Risk category for alcohol consumption by gender.	165
Table 5-31	Proportion taking non-prescription drugs in last 12 months	166
Table 5-32	Injury by age group and gender	168
Table 5-33	Injury and marital status	169
Table 5-34	Practice ownership and injury	169
Table 5-35	Injuries by case mix of animals	170
Table 5-36	Number of injuries by small and large animals	170
Table 5-37	Number of injuries by animal type and gender	171
Table 5-38	Percentage of respondents by hours worked per week	171
Table 5-39	Injury rate by case mix by hours worked	172

Table 5-40	Injury rate & risk taking when first graduated	173
Table 5-41	Injury by taking drugs over previous 12 months	173
Table 5-42	Injury by alcohol intake risk group and gender	174
Table 5-43	Job satisfaction associated with injury	175
Table 5-44	Type of injury received as a percentage of total injuries	175
Table 5-45	Disability from back injury over past 5 years	177
Table 5-46	Back injury in past 5 years by age group	177
Table 5-47	Back injury by case mix	178
Table 5-48	Back injury and risk taking	179
Table 5-49	Pain and disability from repetitive activities	179
Table 5-50	Repetitive activities causing pain and disability by case mix	180
Table 5-51	Odds ratio for variables affecting injury	181
Table 5-52	Serious zoonoses by case mix of animals	183
Table 5-53	Female respondents belief in amount of risk to unborn child	184
Table 5-54	Percentage of respondents with Psychological Distress (PD) 1	186
Table 5-55	Distress levels by 3 age groups	186
Table 5-56	Distress levels by gender	187
Table 5-57	Distress scores by age and gender	187
Table 5-58	Distress score by three age groups by gender	188
Table 5-59	Comparisons between study sample and NSW and WA general populations for high psychological distress	189
Table 5-60	Employment type by two distress levels	190
Table 5-61	Distress levels by practice ownership by gender	190
Table 5-62	Responses to extra questions for K10+ survey	191
Table 5-63	Distress levels by marital status	192
Table 5-64	Distress levels by marital status and gender	192
Table 5-65	Distress scores by hours worked per week	193
Table 5-66	Distress levels by hours worked by gender	194
Table 5-67	Distress levels by working $\leq$ 50 hours a week by gender	194
Table 5-68	Distress levels of respondents by years worked	195
Table 5-69	Distress levels by case mix of animals	196
Table 5-70	Distress levels by injury	196
Table 5-71	Distress levels by number of injuries	196

Table 5-72	Distress levels by back injury	197
Table 5-73	Distress levels and disability due to back injury	197
Table 5-74	Drug taking in past 12 months by distress score	197
Table 5-75	Distress level by drug taking in past 12 months by gender	198
Table 5-76	Use of specific substances by low and high distress levels	198
Table 5-77	Distress levels and anger frequency	200
Table 5-78	Distress levels by happiness	200
Table 5-79	Association of distress and job dissatisfaction	201
Table 5-80	Distress levels by serious and non-serious zoonoses	201
Table 5-81	Coping strategy for stressors	202
Table 5-82	Odds ratio for predictors of risk factors for distress	203
Table 5-83	Odds ratio for additional variables affecting distress	204
Table 5-84	Causes of death & mean age at death	205
Table 5-85	Method of suicide of WA and Vic veterinarians	208
Table 5-86	Method of suicide of WA and Vic support staff	208



## LIST OF FIGURES

Figure 2-1	Treating a horse in the 18 <sup>th</sup> century.	17
Figure 2-2	Glanders in a French veterinary student.	18
Figure 2-3	Hazards and possible outcomes for injury and disease	27
Figure 2-4	Self-reported diseases by gender in Finnish veterinarians <sup>16</sup>	44
Figure 2-5	Suicide Rates per 100,000 persons by Year	60
Figure 3-1	Research Design and Process	71
Figure 4-1	Risk factors for occupational injuries and stress	86
Figure 4-2	Zoonoses incurred by subjects	124
Figure 5-1	Veterinarians in sample by age groups by gender	147
Figure 5-2	Practice ownership by gender (%)	150
Figure 5-3	Hours worked per week grouped by gender	152
Figure 5-4	Happiness today by hours worked by gender	161
Figure 5-5	Incidence of zoonoses among veterinary respondents	182
Figure 5-6	Percentage of respondents with high distress levels by age group and gender	188
Figure 5-7	Comparison of causes of death of veterinarians with the Australian population	206

## GLOSSARY OF ABBREVIATIONS AND VETERINARY TERMS

ABS	Australian Bureau of Statistics
AACV	Australian Association of Cattle Veterinarians
AAHA	American Animal Hospital Association
ASCO	Australian Standard Classification of Occupations
Associate	An employed veterinarian in private practice
APESMA	Association of Professional Engineers, Scientists and Managers, Australia
AVA	Australian Veterinary Association
AVMA	American Veterinary Medical Association
Breaking in a horse	Taming a horse so it can be handled or ridden
BTEC	Brucellosis and Tuberculosis Eradication Campaign
Caesar	Abbreviation for caesarean section
Call or call out	Request for veterinary service to attend to an animal
Calving cow	A cow about to deliver a calf
Calvings	Cows that require assistance in delivering calves (colloq)
Case mix	Term used in this thesis to describe type of animals worked with: small animals (pets), large animals (farm animals and horses) and mixed (small and large animals).
CHIC	Confidentiality of Health Information Committee (DOHWA)
Cradle	Devices that can hold and restrain animals to enable animal husbandry and veterinary procedures to be undertaken. Can often be flipped hence "cradle". Can be fixed or portable.
Cut	Castrate using a sharp knife
Crush	The end part generally of a cattle race used to restrain cattle
C 5-6	Cervical vertebrae 5 and 6. Generally means an intervertebral disk injury at that joint
Dexters	Small breed of cattle originally developed in Ireland
DOHWA	Department of Health, Western Australia
Dry cows	Cows that are non pregnant
Distress	A term used specifically in this study for psychological distress, which was measured using the K10 scale

Empty	Cows that should be pregnant but are not
Euthanasia	To kill an animal usually with an overdose of barbiturate
Gag	An instrument used for holding the animal's mouth open while undertaking veterinary work in the mouth.
GP	General Practitioner (Medical doctor)
HMDS	Health Morbidity Data System
JS	Job Satisfaction Scale developed by Warr, Cook and Wall <sup>2</sup>
K10	Kessler 10 Scale used to assess Psychological Distress
Large animal practice	Practice where more than 95% of animal seen in the caseload are large animals
MHIS	Mental Health Information System
Mixed animal practice	Case mix of large and small animals
Pregnancy testing	Testing cattle to see if they are pregnant. Generally undertaken using a rectal examination or can be undertaken using electrosound probes
PD	Psychological Distress using Kessler 10 Scale (K10)
Race	A narrow fenced area where cows and bulls pass through in order to undertake animal husbandry or veterinary procedures. May have a crush at the end
RDVIC	Registrar of Deaths in Victoria
RDWA	Registrar of Deaths in Western Australia
Rectal examination	Placing one's hand and arm in the rectum of a horse or cow to determine if the animal is pregnant
Respondent	This specifically refers to those veterinarians who responded to the self-administered questionnaire in Phase 3
Scanner	Electronic equipment used for checking to see if an animal is pregnant
Shute	Similar to a race or crush
Small animal practice	Practice where more than 95% of case mix are small animals
Spay	Removing ovaries and usually the uterus
Strain 19	Live vaccine used to inoculate cattle against Brucellosis
Stress	Denotes anything that results from emotional or mental strain
Subject	In the study, this refers to those veterinarians who were interviewed in Phase 1.

TAFE	Technical and Further Education (College)
TB Testing	Testing cattle with a small amount of inoculum to see if they have been exposed to bovine tuberculosis
Twitch	Device used to pacify horses by applying pressure on the nose, either as a displacement activity or to generate endorphins
Utes	Utility truck (Australian term)
Vaccinate	To inject an animal with vaccine to prevent disease (same as for humans)
Vet	abbreviation for veterinarian
VSBA	Veterinary Surgeons' Board of Western Australia
VS Register/Roll	Register of names of all registered veterinarians in WA, published in the Government Gazette
WADLU	Western Australian Data Linkage Unit
Wether	Castrated ram
45/20	Killed vaccine used to inoculate cattle against Brucellosis

# CHAPTER ONE

## 1 INTRODUCTION

Private practitioners carry out the majority of veterinary activities in Australia. There are also a substantial number of veterinarians employed by government agencies, pharmaceutical companies, universities, zoos and wildlife parks.

Despite the variety of roles played by veterinarians, almost all are at risk of occupational injury and disease and yet scant attention has been given to the occupational health problems that veterinarians face in carrying out their roles.

This thesis is the culmination of a series of research activities that were undertaken to establish the major risk factors for occupational injury and disease among veterinarians. The actual theme of the thesis developed over a long period during which time the researcher, an Australian veterinarian, observed occupational injuries, diseases and stress among colleagues.

### 1.1 BACKGROUND TO THE STUDY

The rationale and professional context for the study is presented. The researcher, also experienced first-hand some of the occupational injuries, diseases and the emotional stress placed on veterinarians by virtue of their type of work, hours worked and the expectations of clients and of the general public. Her recollections summarise some of this:

*I clearly recall the experience of my first occupational injury. My one-year-old son was playing in his playpen in a back room as I saw various clients and their pets. I was 19 weeks pregnant at the time. I was frantically busy and it had been a long day. I needed to have a Labrador dog on the table to examine his ears and the client was incapable of lifting the dog. Instead of asking for help, and forgetting that I was pregnant, I heaved the dog onto the table by myself. I immediately felt a tug, a twinge, at my side. Possibly a strained muscle I thought and then forgot about it. I completed treating the dog, picked up my son, closed the practice for the day and did the shopping on my way home. I felt a little uncomfortable but nothing more. About three hours later while watching television I realised that I was having a miscarriage, so I called my husband who immediately took me to the local doctor who said, I would most likely lose the baby. We had a hard time convincing the doctor that this was no normal miscarriage but was a result of physical exertion. The doctor finally agreed to try to save the pregnancy. After treatment and with my feet up for a week, I saved the baby who was subsequently born without any abnormalities.*

The researcher, using her professional name of Helen Jones, was a former State and National President of the Australian Veterinary Association (AVA). She conducted surveys of veterinary nurses in the 1980s and 1990s, about workplace injuries and diseases incurred by veterinarians and staff. In her role with the AVA, she noted with concern, the number of suicides that appeared to be occurring in the profession in increasing numbers. It was this occurrence of occupational injuries and the apparently high suicide rate that led to her researching these issues and to investigate the emotional health of veterinarians in the current study. This researcher commenced investigations into the general area of occupational health, initially supervising a Master of Science thesis on *Radiation and other occupational hazards in veterinary practice in Western Australia*.<sup>3</sup> The results of this study, which used a self reported questionnaire, revealed that over a 10 year period more than 70% of veterinarians had been injured, mostly from dog and cat bites and scratches, and other injuries including back injuries, especially from working with large animals.

Two refereed papers reporting these findings were published in the Australian Veterinary Journal<sup>4,5</sup> but these studies did not identify risk factors and more research in this area was needed. Ideally, a longitudinal study conducted over a longer period, for example three years, where veterinarians responded to questions about injury and reported on these as each injury occurred would ascertain such factors. However to complete such a study would have been beyond the realm of this PhD. A different approach was therefore, required. This led to undertaking research incorporating in-depth interviews with veterinarians to determine more detailed information about injuries than could be obtained from a self-reported questionnaire.

Around the same time, the researcher learnt about the Western Australian Data Linkage Unit (WADLU) that can link the names of individuals or of groups such as veterinarians, with databases of records of health for all Western Australians. The Health Information Centre of the Department of Health, Western Australia, maintains this database. The inclusion of data from WADLU in this study was used to generate statistics on disease and injury in Western Australian veterinarians.

After data linkage had been carried out, it became obvious that there were a number of problems with the output, largely as a result of the database of

veterinarians' names being incomplete. When it became apparent that this method would not provide sufficient information about disease and injuries in veterinarians, it was decided to include a self-reported questionnaire to provide more information and enhance the reliability of the data obtained through the in-depth interviews.

The topic of occupational injury and disease is extremely large and it became necessary to exclude some areas. For example, radiation was investigated by Jeyeratnam<sup>3</sup> and his results showed that irradiation, while still a hazard, was not a major problem for the veterinary profession in Western Australia. It was therefore not included as part of the current study.

Other areas not investigated in the present research were injuries and disease from chemicals, burns from hot and cold environments, electric shock, and hearing loss. Hearing loss from exposure to loud noises, for example in piggeries, may be an occupational hazard for some veterinarians and these areas have received only infrequent mention in the literature.

In 2001, the Veterinary Surgeons' Board in Western Australia (VSBWA) surveyed registered veterinarians in Western Australia. The survey was similar to one undertaken in New Zealand<sup>6</sup> and reported on stress among veterinarians. The analyses of the WA survey were undertaken by the researcher and the results revealed that there was much more stress and depression among Western Australian veterinarians than had previously been established (Appendix A). These results provided preliminary information for the present study on the emotional health of veterinarians and resulted in the inclusion of questions on emotional health in both the in-depth interviews and the self-reported questionnaire.

The study also included an investigation of suicide rates and it was difficult to obtain reliable data for this part of the study. To determine rates of deaths from suicide, records for all deaths of veterinarians are required. Access to the National Death Index<sup>7</sup> to obtain records of deaths using the occupation code for veterinarians was attempted. The death records, however, did not list the veterinary profession as a single group with its own occupational code, but combined them with 19 other professional groups including animal and plant pathologists and horticulturalists. This meant that statistics and details of deaths of veterinarians as a group were unavailable. Requesting information from the

National Death Index using the name of all veterinarians that had died, was also considered. While the names of many veterinarians who have died are known, some are not. This method would have been costly and time consuming and therefore, was not undertaken.

Instead, Coroner's records from two states were obtained from the Registrars of Births, Deaths and Marriages. Two states, Western Australia and Victoria, listed the occupation of deceased persons on the Certificate of Death and the researcher was able to access these records directly. These records provided enough data to enable the researcher to reach some conclusions about the rate of suicide in Australian veterinarians.

The number of private veterinary practitioners in June 2000, was estimated to be almost 4800.<sup>8</sup> There are also other veterinarians who work either directly or indirectly with animals, including government veterinarians. The total number of veterinarians in Australia in 2001 was estimated to be around 7000<sup>9</sup> and in 2004, over 8000<sup>8</sup>. Exposure to occupational injuries and disease for all veterinarians has the potential to be high with physical, psychological and financial ramifications for the veterinary profession and the community at large.

In summary, to achieve the objectives of the study, the research was developed to encompass four areas of data collection:

- in-depth interviews with veterinarians
- data-linkage of veterinarians' names with the Department of Health, WA databases on health
- a self-reported questionnaire to Western Australian veterinarians
- investigation of records of death of veterinarians from Victoria and Western Australia.



## **1.2 RESEARCH AIM AND OBJECTIVES**

The aim of this project was to identify risk factors for occupational injury and disease, and to assess the emotional health status of veterinarians. To achieve the aim of this study, eight research objectives were identified.

### **1.2.1 Objective 1**

To identify the types of injuries and diseases incurred by Australian veterinarians as part of their work.

### **1.2.2 Objective 2**

To determine major risk factors contributing to veterinarians being injured.

### **1.2.3 Objective 3**

To document veterinarians' views as to whether some of the injuries and disease might be prevented through:

- structural measures
- additional human resources
- new or different ways of practicing
- better equipment
- more time
- reduction of workload
- alleviation of environmental stress levels
- other methods as might be identified by the subjects.

### **1.2.4 Objective 4**

To assess the emotional health of veterinarians including stress, job satisfaction and distress.

### **1.2.5 Objective 5**

To explore the effects that injuries and zoonotic diseases have on the emotional well-being of practicing veterinarians.

### **1.2.6 Objective 6**

To determine the rate of suicide in veterinarians.

### **1.2.7 Objective 7**

To explore the potential relationship between emotional well-being and suicide, taking into account:

- socio-demographic factors including age and gender
- work conditions
- type of practice
- social support.

### **1.2.8 Objective 8**

To establish the main factors that contributed to career choice as veterinarian.

These objectives are addressed in the methodology and results. Those objectives with a significant outcome are discussed with the relevant recommendations in Chapter Six, Discussion and Recommendations.

### **1.3 SIGNIFICANCE OF THE STUDY**

Other studies have concentrated on incidence rather than risk factors for occupational injuries and disease in veterinarians. In order to prevent occupational injuries and disease, one must fully comprehend how these occur and identify their risk factors. To increase the validity of the results of the study, two different but complementary methodologies, quantitative and qualitative, were used. This study will shed new light on disease and injury in Australian veterinarians and on their emotional health – the latter being a much neglected area.

### **1.4 ORGANISATION OF THE THESIS**

Chapter One, this current chapter, presents a brief background to the research and its importance for the veterinary profession. Literature of relevance to the study is presented in Chapter Two followed by the research design in Chapter Three. Chapter Four contains the results of the in-depth interviews undertaken in Phase One of the Study. The results from the quantitative aspects undertaken as Phase Two, Three and Four, are presented in Chapter Five. Chapter Six provides a discussion of all the results and recommendations resulting from the study.

# CHAPTER TWO

## 2 LITERATURE REVIEW

This chapter reviews literature on occupational injuries and diseases among veterinarians; it provides the theoretical underpinnings and establishes the groundwork for the current study. The shortfalls and limitations of previous research undertaken on this topic are reviewed.

The first section of this Literature Review provides an overview of occupational hazards described in veterinarians overseas and then focuses on occupational injuries and diseases in veterinarians in Australia. A review of the demographics of veterinarians, essential to understanding the potential impact occupational injuries and diseases have on Australian veterinarians is included.

The review considers previous research undertaken specifically in the following areas:

- Demographic profile of Australian veterinarians
- Females in the veterinary profession
- History of occupational injuries and diseases
- Causes of occupational injuries and diseases
- Availability of accurate records
- Risk factors
- Emotional health
- Suicide among veterinarians
- Summary of shortfall of studies
- Methodologies used.

From earliest days, veterinarians have cared for horses and cattle and traditionally been involved in food animal production, the treatment of animals, and prevention and eradication of infectious diseases in animals. Today, most veterinarians in developed countries work with small animals and, a substantial number work in rural areas with large animals. They also work in the public health arena to ensure the wholesomeness of animal-based foods and to prevent zoonoses that are transmissible between humans and animals, and undertake research into the newer more virulent emerging diseases.<sup>10</sup> Inevitably these activities expose veterinarians to a variety of potential injuries and diseases.

Veterinary practice in Australia is quite sophisticated, especially in the treatment of small animals. Animals may receive similar medical, surgical and cancer treatments as humans. Some of these treatments involve occupational hazards especially the use of anti-neoplastic agents.<sup>11</sup>

Estimates of the rates and magnitude of occupational injury for veterinarians both in Australia and overseas are imprecise and difficult to obtain and those that are available vary considerably.<sup>3,4</sup> Some studies have shown that at least one in ten veterinarians receive an occupational injury each year.<sup>12-14</sup> A study of Minnesota veterinarians revealed a rate of over 20% per annum.<sup>15</sup> Most reports and studies, however, do not use a consistent definition of injury, which makes it difficult to compare injury rates among the various studies.

The hazards to which veterinarians are exposed may be categorized as physical, chemical, biological and psychosocial. Mental fatigue and stress are occupational hazards but are rarely mentioned, although a recent Finnish study has shown that 73% of veterinarians are stressed.<sup>16</sup>

The major physical injuries to veterinarians are animal related trauma through being bitten, scratched, lacerated or struck.<sup>4,12,13,17,18</sup> Puncture wounds and cuts due to needle-puncture or scalpel and knife injuries, can be significant both in themselves and for the agents they may introduce into the body.<sup>3,4,13</sup>

Veterinarians often carry out repetitive tasks like pregnancy testing, collecting blood samples and vaccination of large numbers of animals. This may result in pain, fatigue, muscle strain and back problems.<sup>17,19,20</sup>

Motor vehicle accidents are another source of physical injury<sup>12,21-23</sup> and some of these have been fatal.<sup>24,25</sup>

An emerging hazard for veterinary practitioners and their staff is physical assault.<sup>3,4,26</sup>

Irradiation has in the past been cited as being a major hazard for veterinarians and their staff.<sup>3,27-29</sup> Today, veterinarians are aware of the dangers of irradiation and health problems due to this hazard, are rarely reported. Irradiation will not be included in the risk factors being studied for this research, but will be briefly mentioned in this literature review in order to provide a complete picture of occupational hazards.

Veterinarians and their staff are continually exposed to many toxic and potentially hazardous chemicals including disinfectants and sterilants, anaesthetic gases, injectable anaesthetics, pesticides, narcotics, hormones and antibiotics.<sup>4, 5, 12, 30-33</sup> The effects of chemicals as occupational health hazards are difficult to evaluate and, apart from gaseous anaesthetics and drugs like prostaglandins, are rarely recorded as an occupational hazard. Chemical hazards will also be given only brief mention as a risk factor in this literature review and will not form part of this research, except for the two chemical agents mentioned above: anaesthetics and prostaglandins.

The biological hazards to which veterinarians are exposed are zoonotic infections from bacteria, parasites and viruses. Veterinarians commonly incur certain zoonoses, for example, brucellosis, leptospirosis, and Q fever.<sup>34-38</sup> Australian veterinarians are now faced with three emerging, highly virulent infectious diseases: the paramyxoviruses, Menangle and Hendra (formerly equine morbillivirus) with the fruit bat as the likely natural host for both and, Australian bat lyssavirus, found in flying foxes and bats.<sup>10</sup> The latter virus is related to the potentially fatal rabies virus.

Veterinarians are exposed to many allergens including dander, animal hair, saliva, urine, blood and other body fluids as well as chemicals like latex in gloves which cause allergic reactions.<sup>12, 17, 36, 39-41</sup> As a consequence of these allergens, a number of veterinarians have developed asthma from working with certain animal species, in particular, cats, horses and guinea pigs,<sup>4</sup> swine,<sup>41</sup> and certain zoo animals.<sup>17</sup>

Cancer is a disease that has a number of causes some of which may be occupational and, while the majority of cancers do not cause death, most data describing cancer in veterinarians have mainly come from mortality records.<sup>25,</sup>

42-44

Statistics on causes of death of veterinarians are few. There are no figures for Australia on veterinarians' deaths but in the US and UK, there have been several studies on the cause of death of veterinarians.<sup>24, 25, 42, 45</sup>

Workplace stress and excessive physical work leading to mental fatigue have been rarely mentioned in the literature although Heath<sup>46</sup> in his studies of Australian veterinarians has previously expressed concern about this area.

Landercasper<sup>13</sup> concluded after his study of Minnesotan and Wisconsin veterinarians in 1989 that fatigue at the end of a long work day could lead to loss of usual caution that veterinarians exercise in their practice and this might result in physical injury.

It is well known that some veterinarians abuse alcohol or misuse drugs, as do other professionals like physicians.<sup>b</sup> Abuse of drugs and stress or anxiety is known to lead to suicide.<sup>47-51</sup>

Information on the number of suicides in the veterinary profession in England and Wales and California, suggests that suicide among veterinarians is proportionately much higher than for the rest of the population.<sup>25, 52 53</sup>

The next section in this chapter describes the demographic characteristics of the veterinary profession in Australia.

## **2.1 DEMOGRAPHIC INFORMATION**

### **2.1.1 Number and distribution of veterinarians**

Heath<sup>9</sup> undertook a comprehensive review of the number and distribution of veterinarians in Australia and found that in June 2001, there were 6358 resident, registered and apparently working veterinarians in Australia. Figures reported by Animal Health in Australia<sup>54</sup> cited by Heath<sup>9</sup> are quoted as being 15% higher. The total number of working veterinarians in Australia is imprecise because of differences between the data maintained by the State Veterinary Surgeons' Boards and, because many veterinarians are registered in more than one state despite living in another state or overseas.<sup>9</sup> Veterinarians living in border regions of, for example, New South Wales and Victoria, must register in both states or risk prosecution. Some veterinarians who are retired remain registered while others may just cease being registered as veterinarians. Using Veterinary Surgeons Board rolls for each of the six Australian states and two territories, the researcher has determined that in 2001 there were more than 7000 registered veterinarians in Australia. If there were 7000 veterinarians in 2001, it is likely that the number of registered veterinarians in 2004 exceeds 8000.

According to the Report by the Bureau of Statistics on Veterinary Services in Australia, for June 30, 2000<sup>8</sup>, there were 4779 veterinarians working as practitioners in 1792 employing practices in Australia. There were 1153 practices in the city and 1172 in country areas however, it is likely that most of the latter were in provincial cities or larger towns.

Over the past twenty years, the geographic distribution of veterinarians in Australia has changed dramatically, with a major shift away from rural to urban areas, and in the proportion of males and females.<sup>9</sup>

A 2001 survey of veterinary principals who worked in rural practices in Australia, showed that farm animals only occupied 34% of their time compared with 49% in 1991.<sup>55</sup> Heath<sup>56</sup> determined that the percent of time spent on dogs and cats compared with large animals had increased markedly over a ten year period. Overall, it increased from 59% in 1990 to 75% in 2000 and for rural practitioners, small animal work increased from 45% in 1990 to 63% in 2000.

Until recently, there have been only four veterinary schools in Australia: Sydney, Melbourne, Queensland and Murdoch in Western Australia. More recently two new veterinary schools have been established: James Cook University in Queensland and Charles Sturt University in New South Wales. It is not easy to obtain selection to the courses that require high academic results and science prerequisites. Because of the high cut-off scores required for entry – these are similar for medicine, dentistry and law – the course attracts very high achievers.<sup>57</sup>

### **2.1.2 Gender**

Of all the professions showing a dramatic increase in the number of females, nowhere is it more obvious than in the veterinary profession. In 1976, only 10% of registered veterinarians in Australia were women. By 1986, this figure had more than doubled to 21.7%<sup>58</sup> and in Western Australia, it is now almost 50%<sup>c</sup> (Table 2-1).



**Table 2-1 Gender of veterinarians in Western Australia**

Male/ Female	1981 #	1981 %	1991 #	1991 %	2001 #	2001 %	2004* #	2004* %
Male	205	87.2	279	72.3	414	51.8	472	51.4
Female	30	12.8	107	27.7	385	48.2	444	48.6
Total	235	100	386	100	799	100	916	100

Adapted from Heath.<sup>9</sup> \* 2004 Figures supplied from Registrar, Veterinary Surgeons Board of Western Australia, July 2004.

It can be seen from Table 2-1, that the number of female veterinarians increased dramatically between 1981 and 2001 but the proportion of women registered in Western Australia appears to have stabilised since then. According to the Good Universities Guide,<sup>57</sup> there has been a dramatic increase in the number of females entering veterinary courses and currently, about 76% of all undergraduate students are female.

Women formed more than two-thirds of the three graduating classes in Australian veterinary schools between 2001 and 2004. Considering the situation in Western Australia, over the previous three years Murdoch has had graduating classes of 60, with approximately 40 females and 20 males. Over the three-year period, from 2001 to 2004, if all the Murdoch graduates had registered to practice in Western Australia, 120 females and 60 males should have been added to the pool of registered veterinarians if all actually had registered.<sup>d</sup> The actual figure for registered veterinarians in WA in 2004 was 472 males and 444 females<sup>e</sup>, which means that between 2001 and 2004, 58 males were added to the number of registered males practicing but only 59 females. Even allowing for additional veterinarians from interstate or overseas to register for practice in WA in a similar ratio, this means that females are showing a much greater attrition rate than male veterinarians. It appears that the rate of increase of women working in the veterinary profession has slowed despite the increased number of females graduating as veterinarians. The reasons for this are unclear. Females may have been achieving better academic results<sup>f</sup> and be seeking postgraduate training, taking time out for childbirth and rearing, going overseas, or may be leaving the profession for other reasons which are yet to be determined.

### 2.1.3 Hours worked

In 1989, Boland and Morris<sup>59</sup> in examining employment patterns and species caseload of New Zealand veterinarians, suggested that veterinarians worked eight hours per day, six days a week totalling 48 hours a week. Australian studies indicated that the average hours worked were 46 per week in 1984,<sup>60</sup> 51 per week for Victorian veterinarians in 1990<sup>61</sup> and 52 per week for Australian veterinarians in 1990.<sup>62</sup> This latter study commissioned by the Australian Veterinary Association, showed that while these were average figures, practice owners worked longer hours than this.<sup>62</sup>

Gabel's study<sup>15</sup> undertaken in Minnesota in 1999, showed that veterinarians worked over 40 hours per week. Her research also showed that 12.5% of veterinarians worked less than 31 hours a week while 78% worked between 31 and 60 hours per week with 10% working more than 60 hours a week.

The most recent information on working hours in Australia has come in a personal communication from Heath<sup>8</sup> who surveyed veterinarians that had graduated in 1950, 1960, 1970, 1980, 1990 and 2000 to determine changes that occurred in workforce experiences of more recent graduates. He found that there was a relationship between decade of graduation and hours worked with more recent graduates working significantly fewer hours per week ( $p < 0.01$ ) than their older counterparts. He reported that 67% of the 1950 cohort, but only 35% of those graduating in 2000, worked more than 50 hours a week. The percentage working more than 60 hours a week decreased from 31% to 10% between the 1950 and 2000 graduates. In addition, the percentage that worked 41-50 hours per week, increased from 19% to 59% between 1950 and 1990, but this percentage declined to 45%, in 2000. The median hours worked a week for graduates from 1950 and 1960 was 54, from 1960-1970 was 51, from 1980-1990 was 50 and from 1990-2000, it had decreased to 47. This shows that younger veterinarians work fewer hours than those older.

Female veterinarians work on average, fewer hours than their male colleagues. In 1984, it was reported that female veterinarians in Australia worked an average of 41 hours per week compared with 48 for males.<sup>63</sup> By 1990, the average hours worked per week had increased and males who worked full-time averaged 55 hours per week compared with females who worked full-

time who averaged 51 hours a week.<sup>62</sup> Heath in 2004, noted that male equine practitioners worked 55 hours per week and females 49 hours a week.<sup>64</sup>

A survey which looked at work environment and occupational health of 775 Finnish veterinarians<sup>16</sup> showed that females worked 42 hours a week compared with males who worked 44 hours a week. The most hours worked per week were by males in the age group 35-44 years (45 hours) and females in the age group 45-54 hours (43 hours).

Studies have shown that in general, females work between 7% and 20% fewer hours than their male counterparts.<sup>62, 63, 65</sup> Heath found that after working ten years as veterinarians, 52% of females and 27% of males were working half-time or less. According to Heath, while well accepted by practice owners and clients in rural practice, female veterinarians are less likely than their male counterparts to work full-time, continuously, undertake after-hours duty with large animals or become principals of veterinary practices.<sup>46, 65, 66</sup>

The extent to which veterinarians work full-time or part-time may influence their exposure to occupational hazards and may affect stress and fatigue. In his Minnesota-Wisconsin study of veterinarians carried out in 1988, Landercasper suggested that fatigue and physical effort might contribute to injuries incurred by veterinarians because of the long hours worked.<sup>13</sup> A study in 2000 showed that German veterinarians working in excess of 48 hours per week had significantly more work-related motor accidents than those who worked fewer hours, but they did not have other work-related accidents.<sup>67</sup>

It has become increasingly difficult for older veterinary principals in rural areas to recruit and retain experienced veterinarians. A major reason appears to be the long working hours required to service the farm animal industries. This inability to recruit or retain associates, may result in long working hours because of an unrelenting workload and cause stress in older veterinarians. They also receive lower financial return despite undertaking more work, all of which are disincentives to working in rural practice.<sup>8</sup> This issue has also been recognised overseas. The Canadian Veterinary Medical Association (CVMA) Report on the future of the veterinary profession<sup>68</sup> stated that rural veterinarians often experienced excessive demands on their free time without adequate compensation, which placed significant pressures on family life.

The mental aspects of veterinary practice and the physical problems leading to mental fatigue have rarely been addressed in the literature and little research has been undertaken on the stresses experienced by working veterinarians.

#### 2.1.4 Social marital status

According to the Australian Bureau of Statistics (ABS), there are three categories of social marital status. These are:

- a person living with a partner in a couple relationship – such a person is regarded as married
- a person living with a partner in a registered marriage, and
- a person in a couple relationship living with a person of the same sex.

All persons living in such unions are classified as *married*. Those persons not living with another person in a couple relationship are classified as *not married*.<sup>69</sup> In this thesis, the ABS criteria for designating relationships as being married or not married will be used under the heading “marital status”.

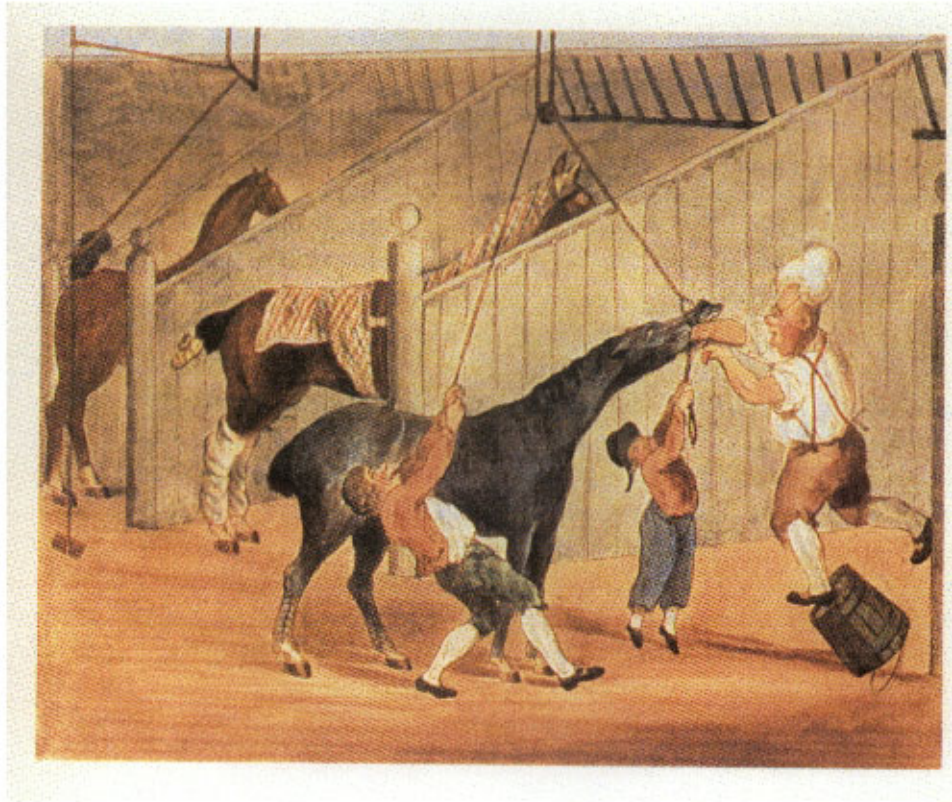
## 2.2 HISTORY: OCCUPATIONAL INJURY AND DISEASE

People working with animals, especially large animals such as horses and cattle, are more likely to be exposed to animal related occupational injuries and diseases.<sup>70</sup> This risk to veterinarians from animals goes back to when the veterinary profession was first established. The modern veterinary profession came into existence in name only after the Frenchman, Claude Bourgelat set up the Academy of Equitation in Lyon in 1762, the first veterinary school in the world.<sup>71</sup> Previous to the establishment of veterinary schools and training specialist veterinarians, farmers, farriers and medical doctors looked after the diseases and injuries of horses while the other animal species received scant attention.<sup>71</sup>

When the first veterinary school was set up, it was necessary to make the transition from farrier to veterinarian and this meant combining an understanding of the behaviour of horses and an ability to handle, restrain, shoe and treat them, with a knowledge of anatomy and a somewhat brief understanding of equine diseases.<sup>71</sup> The early role of veterinarians in the 18<sup>th</sup> century, involved primarily looking after horses at a time when horses were

used extensively for carrying troops into war and transport in general. In those early times, not only were veterinarians at risk from the animals they treated, they also faced the additional danger of being killed in battle.<sup>71</sup>

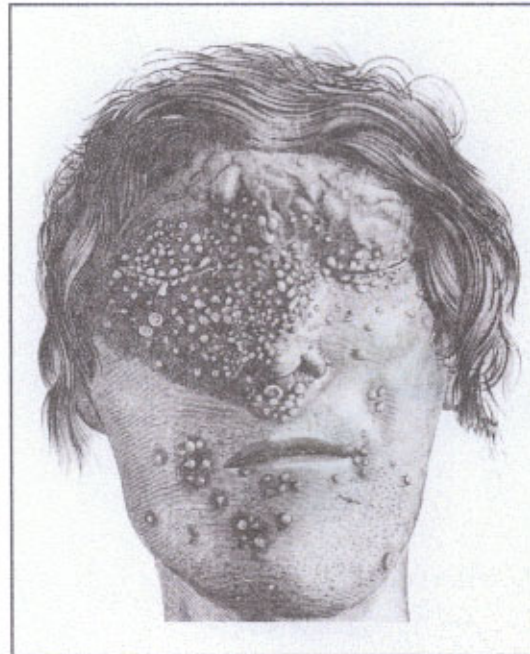
**Figure 2-1** Treating a horse in the 18<sup>th</sup> century.<sup>1</sup>



Before the discovery of anaesthetics and their use by veterinarians, there were enormous occupational hazards from frightened or savage animals that had to be restrained by casting or trussing prior to being operated upon.<sup>71</sup> Figure 2-1 shows two men trying to restrain a horse while a third man is falling off an overturned bucket while attempting, to put a ball or pill down the horse's throat. Knowledge of the risk of exposure and infection with various organisms by veterinarians and people who work with animals has been known for centuries.<sup>38, 72-74</sup> Those at risk often succumbed to zoonotic diseases including anthrax, glanders and melioidosis.<sup>71</sup> The equine disease glanders caused by the bacteria *Burholdina mallei* wreaked havoc during wars by causing enormous morbidity and mortality in horses. It also afflicted veterinarians with terrible sores and little hope of recovery. Numbers of students training to be veterinarians died from the disease.<sup>71</sup> Figure 2-2 provides a sketch of a

veterinary student with lesions caused by glanders, who died of the disease in Alfort, France in 1836.

**Figure 2-2 Glanders in a French veterinary student.<sup>1</sup>**



More than a century later, zoonotic diseases continued to cause problems for veterinarians.

Australian veterinarian, Trevor Faragher described the effect of brucellosis and Newcastle disease on colleagues in the United Kingdom during the 1960s:

*Before I went to the CVL Weybridge in 1961, there had been three cases of TB attributed to centrifugation in ordinary bench centrifuges in the Bacteriology Department. In the 1970s, brucellosis was known among staff in the Department of Diseases of Breeding - an International Reference laboratory for Brucella spp. The head of the department suffered recurrences of Malta fever as he was infected with B. melitensis. A friend of mine refused promotion into the department because of the widely known risk. Eventually, after a staff member sued the MAFF (Ministry of Agriculture, Forestry and Fisheries) - a case that dragged on for years until MAFF settled on the way into court - and an expert from Porton was called in to look at safety procedures, changes were made. Another friend suffered so severely from conjunctivitis due to infection with Newcastle disease virus (we re-isolated the virus) that he needed treatment at the Moorfield Eye Hospital. I escaped home unscathed.<sup>1</sup>*

Veterinarians in Australia also experienced zoonoses in these early times although there are scant references to these and these are mostly hearsay.

### 2.3 ACCURACY OF RECORDS

Occupational injuries in the general population are under-reported<sup>75,76</sup> and according to Landercasper,<sup>13</sup> Sebastian<sup>77</sup> and Wilkins,<sup>78</sup> suggest there may be even greater under-reporting among the veterinary profession. Apart from the possibility that veterinarians are disinclined to report their injuries for fear of having their insurance premiums increased,<sup>k</sup> there may be other reasons why it is difficult to ascertain the incidence of injuries among veterinarians and determine the severity of those injuries. These include defining what is meant by the term *injury*.

Earlier studies used the term *accident* instead of *injury* but there are considerable inconsistencies in the definition of *accident* or *injury*. Sebastian from the Health and Safety Executive in the UK<sup>77</sup> used the term *incident* and avoided the use of the term *accident* because he believes no incident happens accidentally. But incidents or accidents do not equate with injuries and most studies fail to give a comprehensive definition of injury.

### 2.4 INJURY DEFINITION

Gerberich *et al.* from the Minneapolis Regional Injury Prevention Research Center,<sup>79,80</sup> defined injury as:

*An acute traumatic event occurring as a result of veterinary practice either in the clinic or on a client's or employer's premises or during work-related driving activities that resulted in:*

- *restriction of normal activities for at least four hours and/or*
- *loss of consciousness, loss of awareness or amnesia for any length of time and/or*
- *the use of medical assistance (including suturing, antibiotics, splinting, x-rays, surgery, physical therapy).*

The definition above was also used by Gabel in her study of occupational injury in veterinarians.<sup>15</sup>

This definition brings some consistency to results when one is asking veterinarians about injuries. However, even this definition has limitations. Landercasper *et al.*<sup>1</sup> found that many veterinarians sometimes regard their injuries lightly and continue to work on with what others might regard as very

serious injuries. Until there is a consistent and acceptable definition of the word "injury" in this context, it will remain difficult to make comparisons about the extent of occupational injury among veterinarians.

## 2.5 STATISTICS

As indicated previously, in general, occupational injuries are underreported.<sup>75</sup> In the UK, about 50% of incidents in all work places are reported to the Health and Safety Executive (HSE) however for agriculture, reportable work-related incidents are considered to be around 25%. Veterinarians are considered to be in the latter category.<sup>77</sup> The situation in Australia is believed to be no different from that in the US and UK. There may also be a serious underestimation of injuries or disease because up to two-thirds of veterinarians treat their own injuries and regularly use antibiotics and even suture themselves.<sup>13, 15</sup>

There may be financial disincentives to reporting injuries in order to keep workers' compensation insurance rates as low as possible. According to Landercasper, in the US, many veterinarians do not report injuries for fear it would make it difficult for them to obtain medical insurance.<sup>m</sup> Under-reporting is believed to be extremely high.

Accessing insurance records to obtain statistics on occupational injury and disease would appear a way of determining rates but these are limited in Australia, as there is no one major insurer for all veterinarians. In the United States, the American Veterinary Medical Association (AVMA) Insurance Trust is a major insurer for more than 70,000 members and is able to publish meaningful statistics about claims made for injuries.<sup>81, 82</sup>

In Australia, Workers' Compensation records are available only for salaried veterinarians and thus would not include self-employed and self-insured veterinarians. If practices have incorporated as a company, veterinary owners are able to insure for Workers Compensation. Most practice owners take out work disability insurance with private insurers and there are dozens of companies that insure for Workers' Compensation for injuries. One Australian insurance company has provided some statistics on claims made for injuries among veterinarians showing that over an 8 year period approximately 20% of practices insuring with it, reported an injury.<sup>n</sup> They were not able to provide



more information about actual numbers per veterinary practice and it was not possible to obtain more detailed records without breaching confidentiality.

Recent statistics for injuries reported for Workers' Compensation purposes in Western Australia were so few that they were not made available because of the risk of release of confidential information. Workers' Compensation figures for elsewhere in Australia vary and are not representative of all veterinarians. According to one insurance company that insures veterinarians for Workers' Compensation:

*What is clear is that injury and illness in veterinary practice occurs far more frequently than is reported. It is all accepted as simply part of the job. I suspect we just see the tip of the iceberg.<sup>9</sup>*

Consequently, it has not been possible to gather statistics using Workers Compensation data that could provide information about the extent of diseases and injuries in veterinarians. Available insurance records may only be a reflection of the more serious injuries likely to result in loss of income while less severe injuries may go unreported.

## 2.6 INJURY RATES

As stated previously, because of the lack of a definition for the word "injury" in most studies, it is difficult to compare rates. Nevertheless, some rates have been determined.

A study of workplace injuries in veterinarians in the US showed that there were 23.2 injured persons per 100 veterinarians with 34.5 injury events per 100 veterinarians per year.<sup>15</sup> A survey of Finnish veterinarians in 2000 indicated that 34% of female and 35% of male veterinarians had had a work-related accident in the previous year.<sup>16</sup> Other studies state the rate as 10 per 100 veterinarians per year in the US<sup>12-14</sup> however Schnurrenberger *et al.*<sup>14</sup> in a much earlier study found the rate to be 43% for Illinois veterinarians between 1967-1969, which equates to approximately 15% per year. Just over 61% of zoo veterinarians had at least one major injury during their working life<sup>17</sup> which is consistent with that found for veterinarians from Midwestern USA (65%)<sup>13</sup> and from North Carolina (68%).<sup>12</sup> It can be seen, that these rates of occurrence for injury and disease vary considerably and often reflect career injuries<sup>12, 13, 17</sup> rather than rates per annum.

The last available statistics from the Western Australian Department of Occupational Health, Safety and Welfare and the Workers' Compensation Rehabilitation Commission were for employed veterinarians in the period from 1991 to 1996 (Table 2-2).<sup>5</sup> More recent figures have not been released because the number is so few and confidentiality could not be assured.

**Table 2-2 Workers' Compensation claims by veterinary practices in WA 1991-1995**

Period	Claims %		Total (n)
	Women	Men	
1991-1992	84	16	32
1992-1993	88	13	40
1993-1994	97	13	31
1994-1995	91	10	32

Figures supplied by C White, Chief Statistician, WorkSafe, WA 1997

These figures included non-veterinary staff as well as veterinarians. Claims for women far outweighed those for men, which may be a reflection of the number of female staff employed at the time. More recent figures are not available because of an apparent decline in reporting. This may be because of an increase in private insurance.

In Australia one study showed the annual rate of injury to be 7% for practitioners.<sup>3</sup> The results of a later study by the same researcher, was 31% for zoo veterinarians,<sup>29</sup> however the numbers of veterinarians surveyed for this study were very low. More recently, Fritschi *et al.*<sup>83</sup> in preliminary results, has indicated that 19% of Australian veterinarians had been injured in a 12-month period.

## 2.7 TYPES OF INJURY

Some information about types of occupational injuries incurred by US veterinarians in general has been obtained, by reviewing workers' compensation records.<sup>81, 82, 84</sup> The American Animal Hospital Association (AAHA) Insurance records were reviewed to obtain injury records for small animal practitioners.<sup>P</sup>

The American Veterinary Medical Association (AVMA), through its Professional and Liability Insurance Trust insurer, revealed in 1996<sup>82</sup> that most workers' compensation claims for its veterinarian members came from four causes:

compensation claims for its veterinarian members came from four causes: animal bites, animal handling, zoonotic diseases and slips, trips and falls. Many of the animal handling injuries involved back and hand strain and, while only accounting for 13% of injuries over the preceding three year period, they accounted for 28% of the compensation payments.

AAHA's insurance records for workers' compensation claims for the period 1985-1994, revealed that animal bites accounted for more than 55% of all claims with the average claim costing under US\$1000. These injuries accounted for 46% of all claims' costs in 1993-94. Injuries resulting from lifting, bending, stooping, stepping on or falling, accounted for approximately 24% of all injuries incurred, however, they resulted in more than 34% of all workers' compensation claims.<sup>9</sup>

The major hazards in the study of Finnish veterinarians were risk of an injury, serious work-related fatigue and working in cold temperatures.<sup>16</sup>

Within Australia, the Australian Association of Cattle Veterinarians (AACV) undertook a survey of their members in 2001<sup>20</sup> and provided a list of major injuries as a percentage of total injuries, and the percentage of cattle veterinarians with those injuries. They were interested in not only acute injuries incurred from cattle, but also chronic injuries sustained from procedures such as pregnancy testing and delivering calves. The results are provided in Table 2-3.

**Table 2-3 Injuries in Australian cattle veterinarians**

Type of injury	Number with injury	% Total injuries (n=163)
Total back, neck & head injuries	69	42
Lower back injuries	38	23
Neck injuries	7	4
Muscular injuries	4	3
Disc problems	7	4
Back problems (non specific)	28	17
Shoulder injuries	66	41
Elbow injuries	60	37
Knee injuries	52	32
Ankle injuries	23	14
Hand injuries	73	45

Taken from Chambers et al.<sup>20</sup>

Some respondents in this study incurred more than one injury. Lower back injuries accounted for 55% of total injuries, neck injuries and disc problems accounted for 10% each and muscular injuries for almost 6% of all injuries. The average age of AACV veterinarians who had been injured was 45.2 years while the average age for non injured veterinarians was 42.6 years. There was no statistically significant difference between the two age groups for injuries. The average number of pregnancy tests undertaken by veterinarians who had been injured was 6335. For veterinarians not reporting an injury, the number was 5927. Again, there was no significant difference between these two groups.

There have been concerns that pregnancy testing of large numbers of cattle contributes to back, knee, ankle, shoulder, elbow and hand injuries. The AACV survey showed that 41% of cattle veterinarians sustained shoulder injuries, 37% had elbow injuries, 32% knee injuries, and 14% sustained ankle injuries including fractures and sprains.<sup>20</sup> Table 2-4 shows the relationship between pregnancy tests and shoulder, elbow, knee, ankle and hand injuries.

**Table 2-4 Injuries by pregnancy testing and injury**

Type of injury	Shoulder	Elbow	Knee	Ankle	Hand
No. of responses	66	60	52	23	73
Proportion of total respondents	41%	37%	32%	14%	45%
Av. # of preg tests (Injury +ve)	7031	6251	7967	7162	7091
Av. # of preg tests (Injury -ve)	5437	6000	5147	5931	5315
Av. Age (Injury +ve)	43.7	43.8	43.9	47.0	44.4
Av. Age (Injury -ve)	43.7	43.7	43.6	43.2	43.2

Taken from Chambers et al.<sup>20</sup>

preg is abbreviation for pregnancy

The AACV study also revealed that those who undertook more pregnancy testing, had statistically significant more knee injuries ( $p < 0.05$ ).<sup>20</sup>

Reports of claims made in 1997 obtained from WorkSafe WA,<sup>1</sup> were primarily for animal bites (36%), sprains and strains (28%) and muscular stress (15%), being hit by falling or moving objects (9%), contusions and crushes (9%), being hit by an animal (8%) and falls (8%). Five percent of claims were for motor vehicle injuries.

In 2001, a survey was undertaken by Fritschi *et al.* of more than 5000 Australian veterinarians with 2800 veterinarians responding to a self-reported questionnaire. The results have yet to be published although some information has been reported at conferences<sup>85</sup> and in the press.<sup>86, 87</sup> Preliminary results showed that veterinarians have higher levels of injury and stress at work than most other professionals. More than 50% of respondents in this survey, claimed to have experienced an acute injury requiring hospital treatment and time off work, while 49% reported chronic injuries, for example, sore backs and knees from lifting heavy animals. The study indicated that 20% had received an injury in the year prior to the research.

## 2.8 RISK FACTORS

Apart from a number of surveys of veterinarians providing statistics on occupational injury and disease, there has been little information on risk factors for these. Some risk factors for have been identified by Gabel<sup>15, 88</sup> who used a nested case-control study to investigate injury but not disease. She determined increased rates of injury for veterinarians with prior injuries, participated in sports, currently smoked and with less than 6 hours sleep a night. She found decreased injury rates for experienced veterinarians, who undertook aerobic or sporting activities and, who had a perception of lower risk.

Gabel's study defined an *injury* as one that incapacitated veterinarians for four or more hours. Even using this definition, injuries were missed because some veterinarians wrote in injuries they received which did not fit the definition. It means therefore, that there may have been an even higher incidence of injury because of incorrect reporting.

## 2.9 CLASSIFICATION OF OCCUPATIONAL HAZARDS

Hazards to which veterinarians are exposed can be broadly classified as:

- physical
- chemical
- biological
- psychosocial

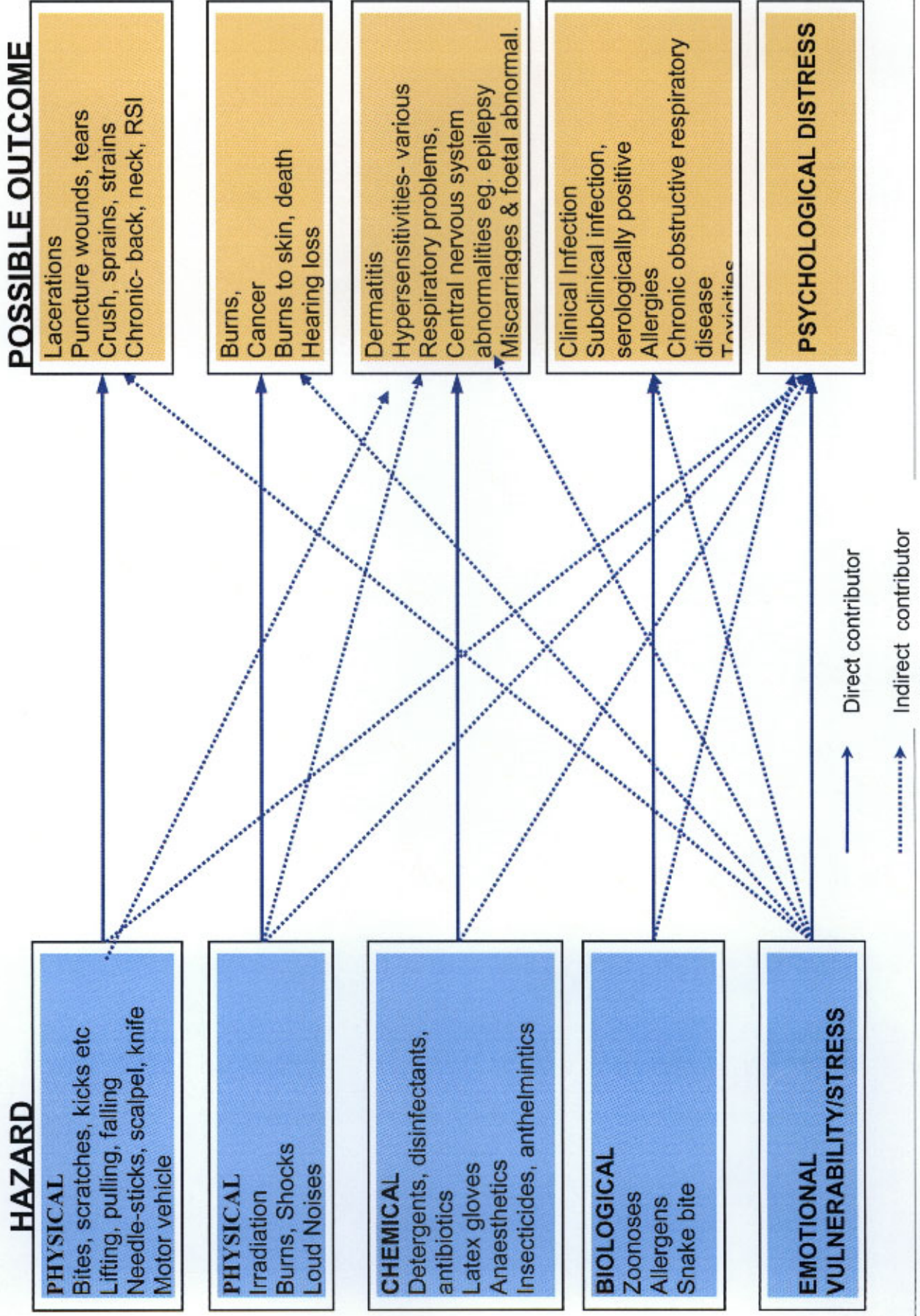
Figure 2-3 provides a schematic overview of hazards and possible outcomes to help with the reading of this literature. Hazards and possible outcomes are linked by lines and arrows. Major physical hazards such as bites, scratches and kicks can lead to lacerations, tears and puncture wounds. Lifting, pulling and repetitive actions can lead to neck, shoulder injuries and back problems. As an indirect consequence of such injuries, veterinarians may become stressed. Other physical (minor) diseases are rarely reported as causes of occupational injury and disease in veterinarians and include irradiation, burns, shock and loud noise.<sup>3, 4, 17, 29</sup> These can lead to burns, cancers, hearing loss and death. Stress may be an indirect outcome from injuries or disease caused by these.

Chemical hazards are encountered daily by clinical practitioners and include detergents, anaesthetics and insecticides. Contact with these can lead to dermatitis, hypersensitivities and in severe cases, central nervous disturbances like epilepsy, miscarriages in females and foetal abnormalities.<sup>89-91</sup> Stress could be an outcome of these diseases.

Biological hazards include zoonoses, allergens such as dander and snake bite. Zoonoses can lead to clinical infections,<sup>37, 72-74, 92, 93</sup> allergens can develop into asthma and chronic obstructive respiratory disease<sup>18, 36, 39, 40</sup> while snake bite can lead to toxicities. This form of toxicity is rarely seen although some veterinarians have reported clients bringing live snakes into the practice for identification when their pet has been bitten. Again, an outcome for zoonoses could be stress.

Emotional vulnerability has been included as a hazard because stressful persons might be prone to injury and disease including cancer. Psychological distress and mental health disease has been included as an outcome of many of the hazards.

Figure 2-3 Hazards and possible outcomes



A brief description of injuries and hazards follows with greater emphasis being placed on physical hazards. Radiation has been excluded as this has not been shown to be a major hazard for veterinarians in previous studies.<sup>3, 4, 12, 13, 29</sup>

Little research has been undertaken on the emotional well-being of veterinarians, although many studies support the notion that emotional vulnerability in general, can have considerable impact on professional practice. The relationship has been well established with doctors,<sup>94-96</sup> nurses<sup>47, 97</sup> and dentists.<sup>47, 49, 50, 98, 99</sup>

### 2.9.1 Physical injuries

The major physical injuries to veterinarians are animal related trauma from bites, lacerations, and being struck by an animal.<sup>4, 12, 13, 15, 18, 100</sup>

Examples of injuries reported for insurance purposes for veterinarians working with small animals in the US are presented (Table 2-5 ).The table shows loss descriptors for AAHA Workers' Compensation Losses for 1993-94 and shows that 95% of injuries were from physical causes mostly from dog and cat bites and cat scratches.

**Table 2-5 AAHA Workers' Compensation Losses 1993-94**

Loss description	% total # claims	Claims as % of total costs	Av cost per claim US\$
Animal/insect bite	59	46	971
Absorption of toxin (rabies exposure)	5	2	347
Lifting or stepping on objects	10	20	2445
Sharp objects	5	1	270
Fall on level or elevation	5	8	2001
Struck against	3	1	242
Particle in eye	3		176
Struck by (animal or object)	2	2	1087
Overexertion	2	7	4617
Bending/stooping	2		337
Caught in/under	1	2	1977
Pushing/pull objects	1	1	2140
Rubbed or abraded	1	1	1080
Recurrence of injury	1		300
Inhalation of toxin (1 case)	-	5	20,000
Contact extreme temperature (1 case)	-	3	12500
Carpal tunnel syndrome (1 case)	-	1	5000
Motor vehicle accident (1 case)	-		617
Falling objects (1 case)	-	-	322
Dermatitis (1 case)	-	-	77

Taken from AAHA insurance records provided by Froelich.<sup>d</sup>



Zoo veterinarians experience similar physical injuries to other categories of veterinarians although some hazards are specific to their workplace.<sup>17</sup> More than 60% reported at least one major animal-related career injury. Table 2-6 displays physical injuries sustained by zoo veterinarians.

**Table 2-6 Animal-related injuries in zoo veterinarians**

Animal-related injury	% injured zoo study <sup>17</sup> n=279
Needle-puncture	87
Animal bite	55
Kick	29
Scratch	23
Other	16
Knocked over	15
Stepped on	12
Crush	10
Horn wound	7

More than 60% of zoo veterinarians reported a back problem and/or pain from repetitive activities. Twenty percent indicated they had pain from repetitive activities.

The other injuries not listed above in the zoo study included talon punctures and lacerations, shoulder separation, finger dislocation, broken teeth, fractured wrist and nose, fractured hand, other hand trauma, hernias, herniated disks and cervical fractures. There are some similarities to responses obtained for the pig veterinarian study. Seventy three percent of pig veterinarians received needle-puncture injuries and only half the proportion of pig veterinarians had back injuries<sup>18</sup> compared with zoo veterinarians.<sup>17</sup> Obviously zoo veterinarians face many more hazards than pig veterinarians, and in these two studies, there is no clear distinction between cause of injury and nature of injury. Of the 62% of zoo veterinarians injured, 18% were hospitalised<sup>17</sup> compared with 2% of the 13% of pig veterinarians who were injured.<sup>18</sup>

In 2003, Jeyaretnam<sup>29</sup> investigated the major risk factors for veterinarians employed at zoos and wildlife parks. He showed that 60% of the veterinarians had sustained from one to three injuries, mainly crushes, bites and scratches in the previous five years. Most veterinarians in his study treated themselves, although three veterinarians (15%) of the 20 participants had hospital treatment because of a fracture, kick or major bite.

A 1989 study of occupational injury in Saskatchewan veterinarians, showed that a substantial number of respondents had sustained a major injury from a farm animal and several veterinarians had been forced to leave large animal practice because of chronic degenerative knee disease as a consequence of their injury.<sup>101</sup>

Gabel's study<sup>15</sup> of occupational injury among Minnesotan veterinarians showed that the top six causes of injury and disease were all physical, with the main one being bite punctures (31%), followed by lacerations (12%), sprains and strains (17%), needle-puncture injuries (6%), crushing (4%) and repetitive motion (3%).

Cattle veterinarians surveyed in Australia in 2002 indicated they had received a variety of injuries to back, neck and head, shoulders elbows, knees, ankles and hands. Hands received the most frequent injuries (45%) which were mainly cuts or lacerations, crushes, fractures.<sup>20</sup> This study also reported arthritis as a result of repetitive veterinary activities for example, pregnancy testing. The Australian Association of Cattle Veterinarians (AACV)<sup>20</sup> survey asked about the future of rural veterinary services; 42% were optimistic while 17% were pessimistic and nearly 20% undecided. The proportion of pessimistic respondents may indicate dissatisfaction with working as veterinarians.

#### 2.9.1.1 *Animal bites and animal-induced lacerations*

Most veterinarians work with small animals and it is bites that cause most injuries. The earliest record of injuries to veterinarians is from the American Veterinary Medical Association Group Insurance Trust in 1967-1969.<sup>81</sup> They revealed that of 773 accidents that occurred during the three year period, only 10.9% were due to cat or dog bites. A comparison made 27 years later<sup>82</sup> showed that animal bites then accounted for 49% of all workers' compensation claims but only 16% of compensation payments. Lacerations and puncture wounds were the commonest injuries in the majority of studies.<sup>12, 13, 17, 81, 82, 100</sup> Landercasper *et al's* 1988 study of 995 Minnesota and Wisconsin veterinarians<sup>13</sup> showed that 65% had sustained a major animal-related career injury. Of the most severe animal-related injury sustained, interestingly enough, bites and scratches, accounted for 38% of all injuries.

A survey of 1023 practicing veterinarians undertaken by Gabel<sup>15</sup> showed there were 23.2 injured persons per 100 veterinarians in 1996 providing 349 injury events and the majority of these (43%) were bite punctures and lacerations. Jeyaretnam *et al's* findings in 1993<sup>3</sup> supported this showing that dog and cat bites and cat scratches were the major cause of injury for West Australian veterinarians.

Dogs, and to a lesser extent cats, account for most bites and about 85% of bites harbour potential pathogens.<sup>102</sup> Some studies have stated that the infection rate in humans from dog or cat bites was over 45% however the conclusions were based on biased data derived from cases seen at hospitals and selected for study if there was swelling or overt infection.<sup>102-104</sup> Current literature indicates that the infection rate from dog bites is between 2% to 25%<sup>105, 106</sup> while cat bites may give an infection rate of up to 50%.<sup>106, 107</sup>

Dog bites often lacerate the skin whereas cat bites tend to cause deeper wounds because they puncture.<sup>102, 106, 108</sup> This influences the likelihood of sustaining an infection.

#### 2.9.1.2 *Strains, sprains and crushes*

Strains and crush injuries are the next most common injuries incurred by veterinarians. These may involve tripping or falling from a height or being caught in a cattle crush resulting in injuries from gates or shutters, overhanging equipment, back injuries from moving or lifting equipment and heavy bags of animal feed. The resulting lacerations, strains, sprains and crushes can be as severe as those with direct animal involvement.

Of great concern in veterinary practice are the number of back strains and hand strains which can be costly.<sup>82 \*</sup> In the US, almost half the back and hand strains in veterinarians were due to lifting animals. A survey of American swine veterinarians<sup>18</sup> showed that 31% of veterinarians experienced back problems as a result of moving or lifting pigs. Pain was mild for 45%, moderate for 38% and severe for 17% of respondents. Unfortunately the researchers did not request information regarding the actual cause of the back injuries. More than 60% of zoo veterinarians sustained back injuries.<sup>17</sup>

### 2.9.1.3 Animal species causing injury

The most severe injuries to veterinarians are caused by large animals.<sup>101</sup> Cattle and horses were the most common animal species involved in injury in the American Veterinary Medical Association 1967-69 survey,<sup>81</sup> however, that may be a reflection of the type of veterinary work being undertaken when the survey was undertaken more than 35 years ago. Gabel's 1996 study<sup>15</sup> showed small animals caused 50% of all injuries with cattle being responsible for only 28% and horses and other large animals causing 12% of all injuries.

Cats, dogs and small pets were the main source of injury for the AAHA workers' compensation claims<sup>t</sup> because the majority of its members are small animal practitioners.

There have been a number of major injuries to veterinarians from farm animals, primarily cattle, although horses may also be involved.<sup>101</sup> There has been the occasional report of a death of a veterinarian as a result of an animal attack. In a report on farm-related fatalities in Australia between 1989 to 1992, 36 fatalities were caused by animals with horses responsible for 92% of these.<sup>70</sup> Large animal veterinarians work on farms and are also at risk from injuries and deaths due to animals, but there have been no reports of any farm fatalities involving them.

A comparative summary of key studies shows the percentage of animal related workplace injuries and species responsible (Table 2-7).<sup>12, 13, 15, 81</sup>

**Table 2-7 Workplace injuries by animal species for four studies**

Animal species	Thigpen and Dorn <sup>81</sup> 1967-69	Landercasper <i>et al.</i> <sup>13</sup> 1988	Langley <i>et al.</i> <sup>12</sup> 1995	Gabel <sup>15</sup> 2000
Cattle	52	47	17	31
Horses	24	15	14	
Dogs	17	24	35	24
Cats	3	10	28	21
Pigs	3	2	2	-
Other large*				13*
Other small #	1	2	3	10
Total	100	100	100	100

\* Other large animals were unspecified but included horses, pigs, deer, and sheep.

# Includes small pets like gerbils, rats.

The percentage of injuries caused by large animals was almost 80% for Thigpen and Dorn in 1967-1969, 64% for Landercasper *et al.* in 1988, 33% for Langley *et al.* in 1995 and 44% for Gabel in 2000. The changing percentage of large animals causing injuries is a reflection of the changing case mix of animals seen by veterinarians. Gabel's study was undertaken in a major dairying state where many veterinarians have a high proportion of cattle in their case mix whereas Langley *et al.*'s study was in North Carolina where there are fewer cattle.

#### 2.9.1.4 Needle, knife and scalpel blade

Puncture wounds and cuts due to needles or scalpel and knife injuries can be significant for the injuries sustained and for the agents injected.<sup>4, 13, 109, 110</sup> Potential illnesses due to vaccines are significant and most likely under-reported.<sup>110</sup> Wilkins and Bowman<sup>78</sup> reported that 64% of 2532 female veterinarians who had graduated from veterinary colleges between 1970-1980, had received at least one needle puncture injury. Most needle punctures were uneventful, however, 16% of all needle punctures caused adverse reactions. Most produced localised effects and were relatively mild. There were some that produced severe and systemic effects including a spontaneous abortion from a prostaglandin injection.<sup>78</sup>

Often, veterinarians inadvertently puncture themselves when injecting vaccines. Vaccines generally contain adjuvants that affect their absorption and it is the adjuvants that often cause damage. If accidentally injected into the tissue surrounding a vein, severe tissue reactions in the region may result causing sloughing of tissues at the injection site.<sup>108, 111</sup>

A survey of Wisconsin veterinarians reviewed accidental self injection of *Mycobacterium avium paratuberculosis* vaccine used for Johne's Disease.<sup>112</sup> This study showed there were 22 out of 199 veterinarians who reported needle injury exposures with a mean incidence of needle-punctures of 5.5/100 veterinarians per year and five adverse reactions due to the formulation of the vaccine.

Needle punctures were the most frequently reported injury for zoo veterinarians<sup>17</sup> with 87% of respondents reporting one or more needle punctures over their career with 7% of veterinarians requiring medical treatment for severe lacerations, infections or adverse reaction to injected agents. This compares with 73% of pig veterinarians<sup>18</sup> reporting one or more needle punctures over a two-year period. Vaccines were the most common exposures followed by pig blood, antibiotics and prostaglandins, ivermectin and clean empty needles. Only 6% of

respondents reported needle-puncture injuries in Gabel's study<sup>15</sup> however the rate is per annum and must have been severe enough to be listed under the injury definition which included limitation of activities for 4 hours or more.<sup>15</sup> Table 2-8 shows the comparisons between the zoo<sup>17</sup> and pig veterinarian<sup>18</sup> studies for needle-punctures and the agents injected.

**Table 2-8 Exposure to specific agents from needle punctures**

Needle exposure agent	% zoo respondents exposed <sup>17</sup>	% pig respondents exposed <sup>18</sup>
No injection or fluid	71	8
Animal blood	58	37
Antibiotics	52	35
Vaccines	52	0
Immobilising agents	17	0
Other	9	1 (prostaglandin)

"No injection or fluid" in the above table, indicates the veterinarian stabbed themselves with an empty syringe

Stabbing oneself when collecting blood samples from animals or giving antibiotics or vaccines are common ways of incurring a needle-puncture injury.

Overseas, veterinarians given rabies vaccine after treating dogs or cattle with rabies, have experienced adverse reactions to the vaccine. Of 296 Illinois veterinarians receiving vaccines against rabies, 21% reported reactions to the vaccine.<sup>113</sup>

Not only are veterinarians at risk from some of the drug formulations in injectable drugs, they are also at risk from the actual dosages used especially when working with large or exotic animals. Fortunately, as most veterinarians work with small animals the doses of drugs that are accidentally injected are generally low. However, veterinarians working with large animals may be exposed to very large doses of injectable drugs, some of which have the potential to be fatal. Seventeen percent of zoo veterinarians reported that they had stabbed themselves with syringes containing immobilising agents that can be highly dangerous, depending upon the amount of immobiliser agent injected. If the dose has been prepared for an extremely large animal, then only a small amount could have fatal consequences.

There were several reports<sup>114-116</sup> in the 1970s where large animal practitioners accidentally self-injected the drug Immobilon, and on one occasion the veterinarian died before he was able to reverse the effects with an antidote. Wildlife and zoo veterinarians are at risk from these drugs and need to have standard protocols when using these immobilising drugs and carry antidotes to reverse the effects.

Authorities have placed restrictions on the use of some of these dangerous drugs and there are no reports in the recent literature of accidental deaths caused by Immobilon.

Adverse reactions from needle punctures include pain, swelling, haematomas, abscesses, and cellulitis.<sup>18</sup> Ninety percent of the participants in the zoo study undertaken by Jeyaretnam<sup>29</sup> had received several needle-puncture injuries over a five year period and were exposed to animal blood, antibiotics, anaesthetics and vaccines. One veterinarian had been exposed to the virus herpes B when treating a macaque.

While needle punctures can cause injury, so too can knife and scalpel blades. These occur frequently, especially among pathologists and others carrying out necropsies. In the study of US zoo veterinarians, 44% of respondents reported injuries while carrying out necropsies<sup>17</sup> compared with 36% of pig veterinarians undertaking post mortems.<sup>18</sup> In the zoo study undertaken by

Jeyaretnam,<sup>29</sup> 30% of the veterinarians cut themselves or received infections when undertaking necropsies.

### 2.9.1.5 *Chronic back, neck and repetitive strain injuries*

Chronic back, neck and repetitive strain injuries (RSI) are considered together because many back and neck injuries have a slow onset and are a result of repetitive injuries. Veterinarians, especially those working with large animals, carry out many repetitive tasks. For example, pregnancy testing, collecting blood samples and vaccination of large numbers of animals at a time, can lead to pain, fatigue, muscle strain and back problems.<sup>17</sup> Gabel's study showed that 3% of the veterinarians in Minnesota experienced repetitive motion injuries and back injuries.<sup>15</sup>

As previously described, the Australian Association of Cattle Veterinarians surveyed its members and from 163 responses concluded that long-term pregnancy testing of cattle may play a role in shoulder, knee, ankle and hand injuries but that the relationship was much weaker for back and elbow injuries.<sup>20</sup> Although this survey did not use the term "repetitive strain injury", there were veterinarians who reported having problems with their shoulders and elbows following pregnancy testing including "pain if too many pregnancy tests", "more pain with increased pregnancy testing load" and a strained elbow, with some arthritis and tendonitis".<sup>20</sup> It is difficult to ascertain if repetitive strain is responsible for the injuries noted in the survey of cattle veterinarians where 42% of respondents had received either a back or neck injury.<sup>20</sup> Repetitive activities causing pain were reported by 20% of US zoo veterinarians<sup>17</sup> while more than 50% of pig veterinarians<sup>18</sup> experienced pain from performing frequent injections and/or from bleeding pigs. Morrow *et al.*<sup>18</sup> believed that repeatedly using a syringe especially a pistol grip syringe, could cause "trigger finger" or "trigger thumb", which may progress to tenosynovitis. They also described bursitis of the knee from repeated kneeling and chronic back strain from repetitive bending and lifting. The research also noted that most veterinarians do not undertake these activities on a regular basis and hence muscles and joints have time to recover.<sup>18</sup>

### 2.9.1.6 *Motor vehicle and aircraft accidents*

Motor vehicle accidents have been a major source of physical injury and even death because many veterinarians often have to travel great distances by car to see clients and their animals.<sup>24, 42</sup> Veterinarians in one Australian study drove as



many as 32,000 kilometres per year,<sup>17</sup> although in recent times, the distances travelled may be considerably less.<sup>3</sup> In 2000, Finnish veterinarians drove on average nearly 21,000 kilometres a year although municipal veterinarians travelling on work assignments averaged 31,800 kilometres a year.<sup>16</sup>

Between 1950 – 1973, 14 veterinarians in the US State of Illinois had been killed in work related accidents<sup>21</sup> while car accidents contributed to 7.4% of deaths reported among California veterinarians between 1950 - 1962.<sup>25</sup>

Of 1082 Illinois veterinarians, most had driven between 10,000 and 19,999 miles per year with 313 being involved in 416 car accidents. Most were only involved in single accidents although 69 had two accidents, 14 had three accidents and two had four accidents.<sup>21</sup> The frequency of occupational car accidents was related to the distance travelled.

Motor vehicle accidents were the third most common cause of occupational injuries in American Veterinary Medical Association insurance claims from 1967-1969 accounting for 10% of the 773 accidents.<sup>81</sup> Of 78 vehicles involved in accidents, 62 were actually being operated by the veterinarian, and were primarily cars, although trucks, motorcycles, and aeroplanes also featured.

The Landercasper *et al.* study undertaken in 1988<sup>13</sup> did not mention car accidents as a major injury although they did report that 29% of veterinarians surveyed spent more than 20 hours per week driving as part of their work. Fifty six percent always followed speed limits, however, 32% did not wear seat belts on a regular basis. At the time, it was not compulsory to wear seat belts when driving in Minnesota and Wisconsin. Other studies also revealed that many veterinarians did not use seat belts.<sup>12, 18, 21, 22</sup> By 2000, it was compulsory to wear seat belts in Minnesota and Gabel's study reported that only 1% of veterinarians had a motor vehicle injury.

In the Western Australian study on injuries incurred by veterinarians in 1992-93,<sup>4</sup> only 4% reported having a motor vehicle accident, despite driving large distances per week. The majority of injuries occurred with rural veterinarians, one of whom claimed to drive up to 5000 kilometres in a week.

A number of veterinarians in rural Australia use aeroplanes to travel to clients on remote properties. In Western Australia, both government and privately

employed veterinarians fly aeroplanes in their daily work. One large veterinary practice in North Western Australia has a fleet of small planes while the Western Australian Department of Agriculture leases or allows individual veterinarian employees to own and fly their own planes. No fatalities of veterinarians resulting from private aeroplane accidents have been reported.

Trimpop's study of German veterinarians found that work-related accident occurrence was best predicted by work-related driving distance and risk attitude with a link to working hours and stress.<sup>23</sup>

#### **2.9.1.7 Physical assault**

With an increasing number of drug addicts in the population and a belief that veterinarians either keep cash or have a stock of drugs like pethidine, ketamines, barbiturates and amphetamines, veterinary practices have become targets for criminals, especially after-hours, which puts staff at risk of injury.<sup>4,5</sup>

<sup>26</sup>

A 1989 review of occupational hazards for veterinarians<sup>118</sup> suggested that when premises were burgled by addicts for narcotics and other drugs, there was always a risk of physical violence against veterinarians. However, most physical or verbal assaults on veterinarians and their staff, come from disgruntled irate clients.<sup>4,5,26</sup> More recently in Australia, one veterinarian and his wife were subjected to an assault which almost cost their lives.<sup>4</sup>

#### **2.9.1.8 Other physical injuries**

Irradiation from x-rays and other sources, which may lead to health problems, may be classified as a physical injury as are burns from heated equipment or electricity and cold burns from ice and liquid nitrogen. Electric shock and vibrating equipment also have the potential to cause physical injury however these are rarely mentioned in the literature as a cause of occupational injury and will not be the subject of research in this study.

### **2.9.2 Chemical injuries**

Chemical injuries are rarely reported as a cause of injury despite being listed as a major hazard for veterinarians. While there may be long-term consequences for occupational disease in veterinarians and their staff from chemicals, it is difficult to prove how much disease and injury these have caused. There have

been some studies on the possible effects of chemicals on veterinarians, especially in females.<sup>12, 22, 89-91, 119, 120</sup> Chemical injuries will only be mentioned briefly in this study where subjects have indicated them as a hazard, for example, anaesthetic liquids and gases, and prostaglandins. Otherwise, they will not be investigated.

### 2.9.3 Biological causes of disease

Of apparently greater significance to veterinarians, are biological hazards that include zoonoses, insect bites and allergies to animals. Many veterinarians are known to have animal allergies and these can influence the species of animals that veterinarians work with. The most important and well-known biological hazard for veterinarians are the zoonoses.

#### 2.9.3.1 Zoonoses

Veterinarians are often exposed to zoonotic infections from bacteria, parasites and viruses. Zoonotic diseases are those infectious diseases and infestations shared by humans and lower vertebrate animals.<sup>121</sup> Veterinarians have been one of the high risk groups associated with certain zoonoses for example, brucellosis, leptospirosis, Q fever, ringworm and pasteurellosis, the latter following cat bites. Ringworm is a common zoonosis, but rarely causes serious problems among veterinarians.

While there are excellent descriptions of the zoonotic infectious diseases people share with lower animals,<sup>38, 72-74, 118</sup> there have only been a few older descriptive studies undertaken on zoonoses to which veterinarians are exposed.<sup>34, 35, 109, 122</sup>

A South African study of 88 veterinarians employed at the Faculty of Veterinary Science, University of Pretoria found that 64% had experienced a zoonotic disease.<sup>93</sup>

Giesecke undertook a survey of veterinarians in 1993<sup>123</sup> but this was biased because it involved veterinarians attending the Australian Veterinary Association Annual Conference who wanted to find out their serological levels to zoonoses. Insurance records overseas reveal some statistics about some of the more debilitating zoonoses, but the information published is limited.<sup>14, 81, 82,</sup>

<sup>84</sup> Veterinarians working mainly with farm animals were three times more likely to have had a zoonosis than veterinarians working in other fields. Sixty

four percent of veterinarians had incurred at least one zoonosis (range was 1 to 6) with a mean of 1.7 incidents per veterinarian. Of the zoonoses incurred, 26% were ringworm. According to the studies, most veterinarians with a zoonosis did not take time off work. The zoonoses reported in the South African study<sup>93</sup> are listed in Table 2-9. These do not total 100% because some veterinarians had more than one zoonosis.

**Table 2-9 Zoonoses contracted by South African veterinarians**

Zoonoses	N of cases	% of total
None	32	36
Ringworm	24	27
Brucellosis	7	8
Q fever	3	3
Psittacosis	2	2
Skin parasites	8	9
Parasites (intestinal and blood)	4	5
Toxoplasmosis	1	1
Tick Bite, Rift Valley & West Nile Fevers	30	34
Erysipelothrix	1	1
Rabies and rabies exposure	4	5
Miscellaneous including malaria	9	10

Taken from Gummow<sup>93</sup>

Some of the zoonoses contracted by the South African veterinarians, such as Tick Bite, Rift Valley and West Nile fevers, were specific to the region and not comparable with those contracted by Australian veterinarians. Nevertheless, there are some zoonoses common to veterinarians in both Australia and South Africa.

Accidental inoculation with live *Brucella abortus* vaccine was a common occurrence for veterinarians throughout the world including those in Australia when the Brucellosis and Tuberculosis Eradication Campaign (BTEC) program was initiated. The risk to veterinarians came not only from their exposure to infected cattle but from Strain 19 where accidental self-injection was a common hazard.<sup>124</sup> Consequently, many veterinarians in Australia who were exposed to Strain 19 or infected animals in the early 1970s still show serological evidence of their exposure.<sup>123</sup> The first stage of the BTEC program involved compulsory immunization of cattle with the live attenuated *Brucella abortus* Strain 19 before progressing to the much safer killed 45/20 vaccine.<sup>38, 124</sup>

Despite the potential for incurring severe disease from zoonotic infections, the number of veterinarians infected in Australia is not known. Serological surveys of veterinarians attending AVA Annual Conferences<sup>123, 125, 126</sup> indicated that many Australian veterinarians have sustained serious zoonoses.

The first serological survey was undertaken in 1975 and looked at exposure to brucellosis and Q fever and almost half of practicing large animal veterinarians indicated they had had clinical brucellosis with a substantial number of veterinarians experiencing recurrences and skin rashes. This survey also investigated Q fever titres for those people who claimed to have had clinical brucellosis and concluded that febrile flu-like syndromes in veterinarians may have been incorrectly diagnosed as brucellosis when they might have had Q Fever. Complement fixation titres (CFT) for Q fever were found in 29% of the veterinarians surveyed. Eighty percent of veterinarians working with large animals showed titres to *Brucella abortus*, indicating a high level of occupational exposure, although only 27% of all veterinarians claimed to have had clinical signs of brucellosis. This meant that many veterinarians were exposed to the agent either through *Brucella abortus* infected cattle or through the use of the live Strain 19 vaccine that was used at the time to control the disease in cattle in Australia. It was estimated that in 1976, 48% of large animal veterinarians suffered from clinical brucellosis<sup>125</sup> As a result of the BTEC program with many veterinarians working to control and eradicate the disease<sup>124</sup>, the percentage of veterinarians surveyed reacting to the standard agglutination test (SAT) rose to 64.5% in 1982. Ten years later, 53% of all veterinarians surveyed at the AVA Annual Conference in 1992, of whom 88% were large animal practitioners, showed positive SAT titres.<sup>123</sup> However, only five veterinarians reported having recurrent episodes of the clinical disease. Most clinical disease reported in a 1992 survey was for Q fever with some brucellosis and leptospirosis. Antibodies against *Leptospira interrogans* species were seen in only 3% of samples which had risen from the level of 1% found in 1975<sup>125</sup> and in 1976<sup>102, 126</sup>

The survey of members of the Australian Association of Cattle Veterinarians<sup>20</sup> showed that 35% reported having had a zoonosis including Q Fever (13.5%), Brucellosis (14%) and Leptospirosis (9%). This is similar to results reported for 1992.<sup>123</sup> It is possible that the responses may be biased because veterinarians are

particularly aware of the common zoonoses<sup>3,4</sup> and may only participate in surveys of this kind to confirm that they have had a specific zoonosis.

Despite the potential for incurring severe disease from zoonotic infections being relatively high, the percentage of veterinarians who actually contract zoonotic diseases is much lower.<sup>4,84</sup> This may be because most veterinary work today is in the small animal field.<sup>66</sup> Nevertheless, large animal practitioners are still exposed to the zoonotic diseases, Leptospirosis, Erysipelas and Q Fever and do contract these.<sup>20,123</sup>

There are two emerging virulent infectious diseases that have been known to kill people in Australia. One is caused by the Hendra virus, which belongs to the family Paramyxoviridae with the fruit bat as its natural host. The other is Australian Bat Lyssavirus, found in flying foxes and bats and is closely related to the classic rabies virus. The Hendra virus was transmitted to its two Australian victims, neither of who was a veterinarian, from horses. Exposure to this virus might therefore place equine veterinarians at risk, however it has not been found to be highly contagious.<sup>10</sup> The Bat Lyssavirus may have caused the death of two non veterinary researchers.<sup>10</sup>

Finally, it is interesting to note that one study<sup>34</sup> reported that zoonoses and motor vehicle accidents were associated, however the study provided no evidence of a causal relationship. Schnurrenberger *et al.* in their studies of occupational hazards in Illinois indicated that veterinarians who had incurred zoonoses were more accident-prone. In their study, they compared the rate of zoonoses for 833 veterinarians who had had one or more accidents with the rate for 349 accident-free veterinarians and found a significant difference between these two groups ( $P < 0.01$ ).<sup>34</sup> They concluded that *accident-prone veterinarians are zoonosis-prone.*

### 2.9.3.2 Allergens

Veterinarians are exposed to allergens during their work and these include dander, animal hair, saliva, urine, blood and other body fluids as well as chemicals which can cause allergic reactions.<sup>17,36,39,40</sup> As a consequence of these allergens, some veterinarians are unable to work with certain animal species. More than 20% of those surveyed in a North Carolina study reported having an animal allergy with most being allergic to cats.<sup>12</sup> The next most cited animal

species was dogs, followed by horses, rabbits, cows and pigs. Females were more likely than males to be allergic to animals.<sup>12</sup>

A self reported survey of 497 veterinarians in the Southern Netherlands<sup>41</sup> investigated respiratory disease symptoms occurring within 4-8 hours of working with animals. The survey included questions on coughing, phlegm production, nausea, shortness of breath, headache, dizziness, sneezing, stuffed nose and watery eyes. After adjustment for smoking, history of allergies, age, gender, and use of respiratory protective devices, it was found that large animal practitioners had twice the possibility of having a chronic cough and chronic phlegm production. They were three times more likely to have chest wheezing than veterinarians working with other animal species. Veterinarians working in confined piggeries for more than 20 hours a week were three times as likely to have a chronic cough and phlegm production than other veterinarians. Interestingly large animal practitioners had twice the chance of having an asthma attack than pig farmers who would have had greater contact with pigs.<sup>41</sup>

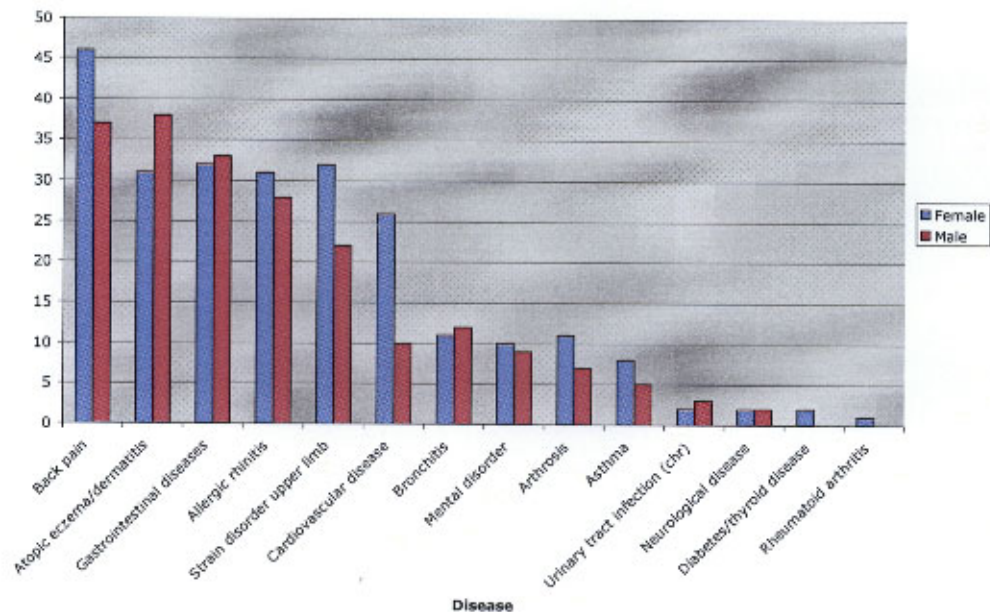
The survey of Finnish veterinarians showed that veterinarians had a number of allergic conditions including atopic eczema, asthma and allergic rhinitis<sup>16</sup> (Figure 2-4).

### 2.9.3.3 *Other diseases*

The Finnish study<sup>16</sup> also reviewed other diseases and injuries including the number of veterinarians with back pain, strains, mental disorders and arthroses, all of which could be outcomes of occupational activities (Figure 2-4).

It is worth noting here that more females than males had back pain, strain disorders in upper limbs, allergic rhinitis and cardiovascular disease.

**Figure 2-4 Self-reported diseases by gender in Finnish veterinarians<sup>16</sup>**



## 2.9.4 Cancers

Carcinogens are simply chemical, physical and biological agents that cause or initiate cancer. According to Glenn<sup>127</sup>, all carcinogens are environmental and are *the aggregate result of social behavior, physical exposure and life-style choices* (p.28), with between 4% and 9% of cancers being occupational exposures. While cancer was not identified as the major cause of deaths in veterinarians, the majority of information about the types of cancers in veterinarians has been derived from mortality records.

Blair and Hayes<sup>24</sup> reviewed the death records of more than 5000 veterinarians who had died in the US between 1947 and 1977 and compared the rates with the general population. They found that the proportion of deaths due to cancers of the lymphatic and haemopoietic systems, skin, brain and colon were significantly higher than for the general population while cancers of the lung and stomach were significantly lower. They suggested that exposure to sunlight may be responsible for the elevation in skin cancers and that ionising radiation from x-ray machines being used for diagnostic radiology may have accounted for the increase in deaths due to leukaemias. There have been considerable improvements in x-ray equipment since then and the introduction of occupational health and safety standards has limited the exposure of veterinarians and their staff to radiation.<sup>4</sup>



Miller *et al.*<sup>25</sup> noted that the standardized proportional mortality rate (SPMR) for veterinarians who had been working in the profession for more than 20 years was significantly elevated for malignant melanoma and bowel cancer if working as a veterinarian for more than 30 years.

Travier in Sweden<sup>44</sup> showed that compared with the national population, there were significant increases in veterinarians for malignant skin melanomas, colon and prostate cancers while there was no significant increase in oesophageal, pancreatic, brain and eye cancers. There was no significantly increased risk for lymphocytic and non-lymphocytic leukaemias.

Fritschi *et al.*<sup>43</sup> reviewed several studies of cancer in veterinarians and concluded that the mortality rate was about the same as for the general population. Veterinarians, when compared with the general population, appeared to have increased mortality from melanomas, haemopoietic cancers and bowel cancer<sup>43</sup>. These researchers suggest that poorly maintained x-ray equipment, insecticides and contact with carcinogenic zoonotic micro-organisms, may be risk factors. It was reported that no study was able to assess the role of specific exposures in cancer risk and that all the studies were on veterinarians who had died rather than on actual incidence. However, more recently, Fritschi *et al.* in a retrospective study of Australian veterinarians they undertook in 2001, suggested that veterinarians had a slightly increased risk for cancer compared with the general population,<sup>43</sup> which contradicts her previous findings.<sup>43</sup>

## 2.10 FEMALE VETERINARIANS

There is increasing concern about possible injuries and disease risks to female veterinarians, especially those of child bearing age, because of physical, chemical and biological hazards associated with their work. There have been a number of reviews of occupational hazards for female veterinarians,<sup>89, 90, 128, 129</sup> which revealed some of the physical hazards to be ionising radiation, physical trauma and needle-puncture injuries. Chemical hazards included formaldehyde, ethylene oxide, antineoplastic agents and gaseous anaesthetics, while zoonoses included toxoplasmosis and listeriosis. In Ohio, Crawford<sup>33</sup> undertook a nested case-control study on infertility and occupational exposures in female veterinarians. He found there was a relationship between

ethylene oxide and infertility but did not find any statistically significant associations between infertility and other agents such as gaseous anaesthetics, hormones, radiation, formaldehyde, diethylstilboestrol, insecticides and solvents.

Using a self-administered questionnaire, Wilkins and Steele<sup>130</sup> surveyed all female veterinarians who had graduated from US veterinary colleges between 1970 and 1980. They found that absolute and relative risks of pre-term delivery were highest for those veterinarians working in equine clinical practice. Exposure specific analyses showed that involvement with solvents among small animal practitioners was associated with the highest relative risk of pre-term delivery, however overall, absolute risks for pre-term delivery and small-for-gestational-age births were much lower, in comparison with the general female population.

An earlier US study showed that exposure to waste anaesthetic gases was not found to be associated significantly with adverse reproductive outcomes for female veterinarians. Use of diagnostic x-rays was, however, associated with a statistically significant increased rate for spontaneous abortion in female veterinarians and veterinary assistants.<sup>131</sup> A California study<sup>22</sup> compared female veterinarians, with female lawyers and showed no difference between the two groups for rate of spontaneous abortions. They did suggest that female veterinarians who took more than five x-rays a week may have been at increased risk for spontaneous abortions, however, the results were inconclusive.

A retrospective cohort study of female veterinarians in Finland from 1973 to 1990, showed that the risk of spontaneous abortion for pregnant veterinarians was 16% compared with other Finnish women (10%) in the 1970s, but since then there has been no difference in the overall risk of abortion.<sup>132</sup>

In the US, the National Institute of Occupational Safety and Health estimated that as far back as 1987, up to 50,000 veterinary staff were exposed to waste anaesthetic gases with the potential to cause abortion. Since then, OSHA has tightened up its rules and policies on waste gas management in veterinary and medical practices.<sup>133</sup>

Fritschi et al. through the University of Western Australia investigated occupational injuries of female veterinarians as part of a larger retrospective

study of occupational health issues in veterinarians. In an undated 2003 press release from Fritschi,<sup>83</sup> the group reported that children born to female veterinarians were more than twice as likely to suffer from a birth defect than those born to women in the general population. From a total of 1337 pregnancies from 565 female veterinarians, 15% of the pregnancies had resulted in a miscarriage, the rate of which was similar to the general population.

## 2.11 SUMMARY OF SHORTFALLS IN STUDIES

Most studies providing statistics for occupational injury and disease in veterinarians report these over the working career. The length of veterinarians' working lives is not reported and consequently, it is difficult to compare rates of injuries.

There is a need for consistency in the definition of injury because many veterinarians tend to regard being "injured" as part of their normal working life. Asking questions about severe dog bite, cat scratch, kicks from horses and cattle, does not necessarily provide records of all injury cases, as was indicated by Landercasper in his studies in 1988.

Previous studies identified that veterinarians have experienced occupational injuries and to a lesser extent, diseases.<sup>3,4,15,88</sup> Most studies, apart from that of Gabel, elicited very little information about the actual risk factors for occupational injuries or diseases.<sup>15,88</sup>

The paucity of data on occupational injuries is also evident in Australia. A previous study by the researcher<sup>3,4</sup> showed that 7% of veterinarians in Western Australia incurred injuries each year however risk factors for these were not obtained. In fact, the results from the 2001 survey of occupational injuries in Australian veterinarians are yet to be published.

## 2.12 EMOTIONAL HEALTH

Emotional health, emotional well-being and mental health are used interchangeably in the literature. The subject *emotional health* encompasses stress, distress and mental health disorders. The veterinary literature has barely addressed emotional health issues that might arise in veterinarians.

There are indications that veterinarians may be highly stressed and may suffer from a number of psychological work-related problems.<sup>23, 83, 85, 87, 134-136</sup> The question arises as to whether psychosocial problems may contribute to injuries incurred by veterinarians or whether lifestyle, injuries and disease actually cause psychosocial disease.

Emotional health involves many areas affecting psychosocial health and stress, and these include mental health disorders such as anxiety and depression, self-esteem, well-being, happiness, and job satisfaction.

### 2.12.1 Stress

Stress is a widely used term in common language and yet when one comes to define the word it is very difficult. Interestingly enough, Encyclopaedia Britannica provides 101 definitions, however very few pertain to both the psychosocial and physiological dimensions of stress. A broad definition that encompasses both aspects of stress is:

*Any strain or interference that disturbs the functioning of an organism. The human being responds to physical and psychological stress with a combination of psychic and physiological defences. If the stress is too powerful, or the defences inadequate, a psychosomatic or other mental disorder may result.*<sup>137</sup>

The UK Government Health and Safety Executive gave a definition of more relevance to occupational health. It defined stress as:

*The adverse reaction people have to excessive pressure or other types of demand placed on them. Pressure is part and parcel of all work and helps to keep us motivated. But excessive pressure can lead to stress, which undermines performance, is costly to employers and can make people ill.*<sup>138</sup>

Mendelson defined stress as both the external stimulus itself and the subjective response to that stimulus.<sup>139</sup> He discussed occupational stress under the following parameters:

- a reduction in work performance and productivity.
- emotional symptoms.
- physical manifestations.

Stress has been known to affect reaction time, physical stamina and mental alertness,<sup>139</sup> while prolonged stress can cause psychological or mental health problems, impairment of work performance and absenteeism.<sup>140</sup>

Under the above parameters, Mendelson<sup>139</sup> classified the signs of stress under the following headings:

- affective disturbances including irritability and/or anxiousness.
- behavioural manifestations including drug and alcohol abuse.
- psychiatric disorders including anxiety and depressive disorders and manic episodes.

The anxiety response to stress includes physiological as well as psychological components. Prolonged and short term effects of stress are increases in corticosteroids and catecholamines which can affect cardiovascular, respiratory, gastro-intestinal and genito-urinary systems and skin.<sup>140</sup>

McEwan<sup>141</sup> undertook considerable research on physiological responses to stress which he termed the *allostatic* load. He described how stress could be influenced by genetics, behaviour and experience. The brain responds to stressful experiences both physiologically and behaviourally leading to allostasis and hopefully adaptation. However if these experiences persist, as occurs with chronic stress, the allostatic load can accumulate leading to an inability of neural, endocrine and immune stress mediators to cope.

Wallenstein,<sup>142</sup> while acknowledging that stress could be useful to the human body, described how physiological stressors lead to elaborate endocrine and immune mechanisms as part of the stress response. On the other hand, while the body reacts in a physiological way to psychological and social stressors these may be far more insidious because they operate on different time scales to the physiological stressors. The result may be prolonged, producing chronic, low level activation of the same endocrine and immune reactions as for an acute physiological episode. The pituitary gland and the hypothalamus are central to this stress response and the hypothalamus stimulates the pituitary gland to produce hormones that regulate other glands throughout the body including the adrenal glands that release cortisol. Using negative feed-back, cortisol feeds back to the pituitary gland and hypothalamus and hippocampus in the brain to regulate its release.<sup>142</sup> Hence stress involves the hypothalamic-

pituitary and adrenal (HPA) axis and increases the amount of circulating cortisol. Trauma, whether physical or psychological, can increase cortisol levels and, according to Wallenstein, if this happens as a child, an exaggerated response may develop for one's entire life. There is a link between mood disturbances, low serotonin levels and a hyper-responsiveness of the HPA system. Wallenstein (p.81)<sup>142</sup> cites Nemeroff who wrote that as a result of an exaggerated HPA response to stress, the serotonin receptor activation would be significantly reduced.

Norwegian and Danish research into psychological stress,<sup>143</sup> found that lack of decision-making authority, low social support from co-workers and few rewards for effort together with high job insecurity, could help trigger psychological stress and cardiovascular disease.

Williamson<sup>144</sup> listed a number of psychological indicators which included increased anxiety, depression, aggression and confusion, and behavioural indicators of increased drinking, smoking, irritability, obsessiveness with trivial issues and poor work performance. Physiological indicators of stress included increases in blood pressure, heart rate, muscle, hypertension and headaches.

Some occupational groups were considered to be more likely to develop physical and emotional manifestations of work-related stress.<sup>140</sup> Mendelson described the effects of work-related stress on work performance and the emotional and physical consequences. He reviewed work-related stress factors for police officers, air traffic controllers, civil aviation pilots, teachers, prison officers and nurses. The closest professional group to veterinarians that Mendelson studied were nurses. He identified work overload, difficulties with other staff, nursing critically ill patients, dealing with difficult or helplessly ill patients and concerns over treatment of patients as factors contributing to 46% of the variance in self-reported stress.<sup>140</sup> Other stress factors identified included inadequate staff/patient ratios in intensive care units, dealing with patients' relatives, job overload, shift work and being exposed to death and to dying patients.<sup>140</sup>

Work-related stress and job satisfaction were investigated for Scottish general practitioners.<sup>145</sup> The research explored their intention to either reduce their working hours or quit. The results revealed that doctors working more than 50

hours a week experienced significantly more stress than those that worked fewer hours. The study also showed that women experienced less stress than men, however, that may have been a reflection of women generally working fewer hours than their male counterparts.<sup>145</sup>

Stress, distress and suicide have been reported in the dental profession.<sup>49</sup> Aetiological factors that contributed to this were identified as specific problems in the workplace, including difficult professional relationships, the personality of the dentist, the need for social approval, lack of physical exercise and relaxation, and alienation from family and social networks. Thirty one potential causes of stress for dentists were listed<sup>49</sup> and many of these could be applied to veterinarians.

A number of other studies involving stress, psychological symptoms and job satisfaction among health professionals have been reported. A New Zealand study of surgeons and pharmacists<sup>146</sup> using the General Health Questionnaire (GHQ-12), and job satisfaction using the Warr Cook Wall scale,<sup>2</sup> showed that both surgeons and pharmacists were satisfied with their jobs, although pharmacists were significantly less so. Ten percent of pharmacists and surgeons may have had severe psychological disturbances. A Finnish survey<sup>147</sup> used the General Health Scale (GHS-12) to predict injuries in hospital personnel and concluded that stressors relating to lack of autonomy of work and difficult or poor interpersonal relationships, were predictors of workplace injuries.

A Canadian survey<sup>135</sup> used data from the National Population Health Survey and multivariate analyses to estimate associations between work stress and health problems. The authors used average values for five measures of work stress (job strain and security, physical demands, co-worker and supervisor support) and prevalence of four health outcomes (migraine, work injury, high blood pressure and psychological distress). They found that job strain was associated with migraine and psychological distress, with women being more prone to occupational injury. High physical demands were related to occupational injury in both males and females, while low co-worker support was linked with occupational injury and psychological distress among women. The study found that there were higher levels of psychological stress among women, however, women in professional occupations had the lowest

psychological stress. This study did not mention veterinarians among the professional groups.

#### 2.12.1.1 *Stress in veterinarians*

The veterinary profession has recently come under scrutiny for possible stress. A recent study by Murdoch University psychology researchers Williams and Davis involved surveying veterinarians to determine possible stressors.<sup>136</sup> They looked at ratings for stress associated with aspects of communication, death and dying, working conditions, business practices and individual factors including age, job satisfaction and social support. Most respondents listed long working hours as being their greatest source of stress with not enough time for family and recreation. Many veterinarians were concerned about lack of back-up assistance when they were ill or wanted to take a holiday. The authors found that the strongest predictor of work-related stress was the degree to which veterinarians felt unappreciated at work.<sup>136</sup>

In 2003, the New Zealand Veterinary Association surveyed its members<sup>6</sup> and found that 29% of veterinarians reported being quite, very or extremely stressed. When asked what would be the most stressed a veterinarian would feel in a typical day, more than 50% of veterinarians indicated they were quite to extremely stressed.<sup>6</sup> The factors contributing to this stress were long working hours, especially after-hours work, unexpected outcomes with treatments and client expectations. Of concern was that 24% of veterinarians claimed to be depressed either reasonably often to nearly all the time. Twelve percent claimed to have been diagnosed as being depressed, 16% said that they had contemplated suicide and 2% said they had actually attempted suicide.

One might expect that there would be an increase in deaths due to heart disease among veterinarians if stress were a major contributing factor, yet Miller and Beaumont<sup>25</sup> did not show this in their study of California veterinarians for the period 1969-1992. They did identify, however, that suicide was significantly elevated among veterinarians, which suggested that stress might have played a considerable role in this outcome.

Recent research on stress and other aspects of emotional health was undertaken in Finland by Reijula *et al.*<sup>16</sup> In their studies, 775 working veterinarians under the age of 65 provided information about occupational injuries, health, work-related fatigue and burnout, alcohol consumption,



smoking habits, drug usage and stress. Over 70% of the respondents were women who worked an average of 41.7 hours per week compared with men who worked 44.1 hours per week. This was for actual work and not for on-call shifts.

Seventy three percent of respondents reported being rather or very stressed. Those who were very stressed were mainly women in the 45-54 age group, while men were in the 25-34 age group. Reported causes of stress were work (65%), family matters (14%) and economic situation (13%) with the most common cause being on call after hours. Six percent of the Finnish cohort indicated they would like to change to another type of veterinary work and 4% considered changing their profession completely. Sixty four percent of participants did not believe there was any possibility of relieving their workplace stress.<sup>16</sup>

There are few statistics available on emotional health, especially levels of stress, depression or numbers of suicides in the Australian veterinary profession. In order to determine if there is a problem in this area, an attempt must be made to assess levels of psychological distress. Heath's 2004 study of 709 veterinarians that work with horses, asked general questions about their stress<sup>148</sup> and whether stress was an occasional or regular part of their work. One third agreed that it was a regular part. Younger veterinarians were significantly more ( $p < 0.001$ ) likely to report experiencing stress than older veterinarians. Nearly 50% of veterinarians working less than 40 hours a week reported they had difficulty balancing work with personal life. This rose to over 80% of vets with difficulty balancing work and non-veterinary work when they worked more than 60 hours a week (Table 2-10). There was a significant difference ( $p < 0.001$ ) in balancing work and personal life, for those working less than 40 hours a week, those working 40-50 hours a week, 50-60 hours a week and more than 60 hours a week.

**Table 2-10 Hours by ability to balance work & personal life**

Hours per week worked	<40 hrs	40-50 hrs	50-60 hrs	>60 hrs
Percentage of vets not balancing work & personal life	49	58	77	82

Taken from Heath<sup>148</sup>

Difficulty balancing work and personal life was inversely proportional to age with 74% of veterinarians younger than 50 years of age having difficulties balancing work and non-work time. The percentage dropped back to 50% for those older than 60 years of age.

The 2001 study by Fritschi *et al.* used standard testing for psychological stress, which included the General Affect Scale, well-being, feelings about work and social support at home. It was reported by one of the co-researchers, Dr Andrew Vizard, told delegates at the 2003 AVA Annual Conference, that 30% of veterinarians were suffering "minor psychological distress".<sup>85</sup> This increased to 55% when the chronicity of stress was examined. He also reported that female veterinarians were more stressed than males.

### 2.12.2 Assessment of emotional health

There are a variety of standardised and reliable psychological scales used for assessing emotional health. These include:

- the Warr-Cook and Wall Test which uses eight measures including self-rated anxiety and life satisfaction.<sup>2</sup>
- the 12 item Goldberg General Health Questionnaire (GHQ-12)<sup>147</sup>
- SF-36 and its more user friendly shorter version, the SF-12 which is a 12 item self administered questionnaire that is used to assess symptoms, functioning and quality of life.<sup>149</sup>
- Brief Disability Questionnaire (BDQ)
- the Beck Depression Scales.<sup>150</sup> These include the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI).<sup>151</sup>
- Kessler 10, K10+ and the modified version Kessler 6 scales.<sup>152, 153</sup>

The Kessler 10 (K10) is a self-report questionnaire designed to yield a global measure of non-specific psychological distress<sup>154</sup> based on questions about levels of restlessness, anxiety and depressive symptoms. The K10 was the scale of choice for assessing levels of stress or psychological distress in the Canadian Community Health Survey<sup>155</sup> although prior to September 2000, the shorter K6 version had been used. The K10 is now widely used in 20 countries including Australia where it was used in the Australian Survey of Mental Health and Well-being (1997) and again in 2001 in the National Health Survey,<sup>154</sup> the 1997 and 1998 NSW Health Surveys.<sup>156</sup>

The scale was also used in Western Australia in 2000 where more than 10,000 adults participated in a telephone survey of health and well-being.<sup>157</sup> The latter survey measured the level of psychological distress in Western Australians among people over 18 years of age. More 18-24 year olds reported distress than any other age group and females had higher levels of distress than males. Since then, more than 23000 people have participated in K10 by Computer Assisted Telephone Interview (CATI).<sup>v</sup>

#### **2.12.2.1 Reliability and validity**

The K10 scale has now been widely used throughout Australia with several hundred thousand individuals using either face-to-face interviews (Computer Assisted Personal Interview) or telephone (Computer Assisted Telephone Interview).<sup>154, 156, 157</sup> Results have demonstrated that this is an excellent, highly reliable and valid indicator of psychological distress. The scale has been validated against the Composite International Diagnostic Interview (CIDI) and the Diagnostic and Statistical Manual of Mental Disorders (DSM) for mood and anxiety disorders.<sup>158 159</sup> There is a strong association between high scores on the K10 and a current CIDI diagnosis of anxiety and affective disorders and a lower but significant association between K10 and other mental disorders.<sup>152</sup>

According to Andrews,<sup>149</sup> for a scale to be suitable as a routine measure of outcome, measures must be brief, comprehensible and easy to score as well as being reliable, valid and sensitive to change. In other words, they should return the same score when there is no change, measure what they claim to measure, and show change when there has been change. The K10 has been proven to be reliable and valid for these factors.

#### **2.12.3 Mental health**

Very little is known about the degree of mental health disease in veterinarians. In Australia, more mental and behavioural problems were found in the general population in single people, in those people without post-school qualifications and those from the most disadvantaged socio-economic areas.<sup>154</sup> In the Australian National Health Survey: Mental Health<sup>154</sup>, using the K10 scale, it was shown that persons with mental and behavioural problems had

significantly more high and very high psychological stress. Of those people with mental and behavioural problems, nearly 20% had a very high level of psychological distress compared with less than 2% of people who had no mental and behavioural disorders. The results of the National Survey indicated that in 2001, just below 10% of the population reported having a long-term mental or behavioural problem. These were mainly mood (affective) and anxiety related problems.<sup>154</sup>

In 2005 Kessler *et al.*,<sup>160</sup> authors of the National Comorbidity Survey Replication study in the US, reported that lifetime prevalence estimates of mental health disorders using DSM-IV<sup>161</sup> classification showed that 29% of the population sampled had anxiety disorders, 21% mood disorders, 25% impulse-control disorders and 15% substance use disorders. They found that half of all lifetime cases were present by 14 years of age and three quarters were present by 24 years.

### 2.13 CAUSES OF DEATH OF VETERINARIANS

There have been a number of studies undertaken to investigate mortality rates and causes of deaths among veterinarians.<sup>24, 42, 44</sup> These studies were, in the main, restricted to white male veterinarians because this group formed the majority of veterinarians when the studies were undertaken and because of the era, there were few females and non white veterinarians. A study by Blair and Hayes<sup>24</sup> investigated the mortality of US veterinarians from 1947-1977, and noted a higher rate of suicides among veterinarians compared with suicide rates in physicians, psychologists, pathologists, dentists, chemists, medical technologists and attorneys. In addition, they reported that proportionate mortality ratios in veterinarians were elevated for brain cancers, haematopoietic and lymphatic cancers. The authors suggested that this might have been related to the use or mis-use of x-rays at that time. The results indicated that doses in excess of 100 mill roentgens per week may also have caused skin and nail disorders. Mortality from motor vehicle accidents was confined to large animal practitioners.<sup>24</sup>

Kinlen<sup>45</sup> reviewed the causes of death of British veterinarians and found a lower mortality compared with the general population for respiratory disease and cancer. However there was increased mortality rate amongst veterinarians

from accidents and violence, which were mainly due to a high suicide rate that was more than double that of the general population. There were no deaths due to animal trauma although two deaths were due to recreational riding accidents.

Charlton et al.<sup>52</sup> analysed the death records for a number of UK professional groups including veterinarians and determined that the latter had the highest Proportional Mortality Rate due to suicide (PMR= 364), followed by car and aeroplane accidents, deaths due to animals, and drugs. The next occupational groups with high suicide rates were pharmacists (PMR=217), dentists (PMR=204), farmers (PMR=187) and medical practitioners (PMR=184).

In a Californian study<sup>25</sup> the mortality records of 450 male and female veterinarians who died between January 1960 and December 1992, were investigated. This results of this study showed that white male veterinarians had significantly higher death rates than the general Californian population, from suicide, rheumatic heart disease, malignant melanoma of the skin and bowel cancer. White female veterinarians showed significantly elevated death rates from suicide.

Attempts to determine the cause of death of veterinarians in Australia have been very difficult because the Bureau of Statistics provides information on mortality to only two levels of the Australian Standard Classification of Occupations (ASCO) coding through the National Death Index. Veterinarians are code 2321 under ASCO. Within the Minor Group 23 are Health Diagnosis and Treatment Practitioners. Veterinarians are included with other professionals in this group along with radiographers, pathologists and parasitologists. Hence, mortality data cannot be examined for veterinarians unless the individuals' names, addresses and date of birth are known. Some states, through their Registers of Births, Marriages and Deaths, do provide the occupation of deceased persons but it is not consistent across all Australian States.

## **2.14 SUICIDE**

Discussion on suicide is difficult because of societal taboo. When suicide appears to be happening at an increased rate in a particular profession it is a very sensitive issue and generally a topic to be avoided. Many older

Australian veterinarians know of at least one colleague who has committed suicide<sup>162</sup> however no Australian studies of veterinarians have ascertained the actual suicide rate. Such data would enable the veterinary profession to make informed judgements about possible responses to such a serious matter.

Suicidality and suicidal behaviours include suicide ideation, attempted suicide and completed suicide. The following definitions have been provided by the National Institute of Mental Health (US).<sup>162</sup>

- Suicide ideation refers to any self-reported thoughts of engaging in suicide-related behaviour. There are degrees of this such as not wanting to wake up or wanting to be dead and this is regarded as "passive" suicide ideation.
- Suicide attempt refers to a behaviour for which there is evidence (explicit or implicit) that a person intended to kill her/himself. The attempt may or may not result in injuries.
- Completed suicide refers to death from self-inflicted injury where is evidence the decedent intended to kill her/himself.

One of the greatest problems with producing statistics on suicide is the accuracy of the data.<sup>163</sup> Official sources that include coroners' courts and government agencies, often have different ways of recording deaths. Sometimes the designation of *suicide* is provided by a coroner while others give the cause of death without designating whether the death was suicide. For example, terms such as "toxic effect of drugs", "drug toxicity (open finding)", "drug related death", "accident", "acute cardiac failure, probably intoxication" or "undetermined" have all been used to describe deaths that may indicate suicide. Hassan in his book *Suicide Explained: The Australian Experience*,<sup>163</sup> stated that when determining cause of death, coroners used subjective criteria in classifying deaths as suicide. There is an expectation that for a death to be classified as suicide, there will be a note confirming the intention. As this is rarely the case, misclassification of suicidal deaths frequently occurs, which seriously affects analysis of suicide aetiology. Hassan noted considerable variation in the classification of death by state coroners, for example, in the period 1972-1981, the South Australian Coroner was more apt to categorize an unexpected death as suicide, while in New South Wales, the Coroner was more likely to categorize unexpected deaths as *undetermined* or *suicide* rather than an *accident* and in the Northern Territory, the Coroner was most unlikely to categorize unexpected deaths or accidents as *suicide*.<sup>163</sup> In Western Australia,

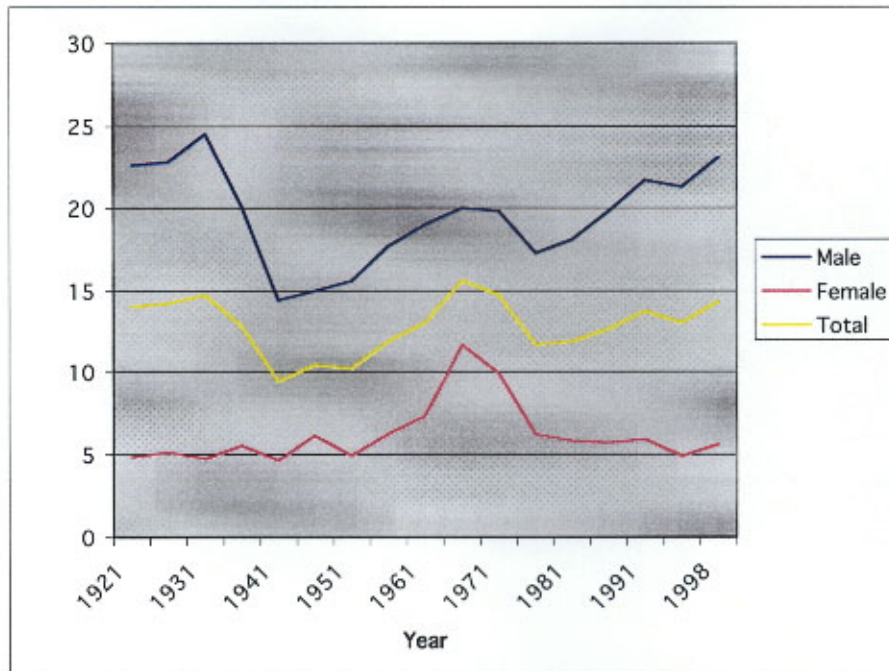
the Coroner's Act requires a verdict of suicide if the death was intentionally self-inflicted. If there is any doubt, the death will not be classified as suicide.<sup>164</sup> Hillman *et al.* investigated suicide in Western Australia for the period 1986-1997. These authors indicated that *there must be overwhelming evidence that the deceased intended to take their own life.*<sup>164</sup> They suggested however, that a verdict of suicide may be inferred from the circumstances relating to the discovery of a note, reports that the person had threatened suicide and the circumstances relating to how the body was found. There may therefore be *open* verdicts. Inconsistency between the various states has meant that some suicides are not included in data analyses.

In Western Australia, the Youth Suicide Advisory Committee established a Coroner's Database on Suicide in 1986. The data can be used for epidemiological surveillance and monitoring of suicide trends.<sup>164</sup> According to Hillman *et al.*, the database has been of vital importance in facilitating an understanding of suicide by both society and the scientific community.<sup>164</sup> This database is maintained by the TVW Telethon Institute of the Child Health Research Institute on behalf of the Youth Suicide Advisory Committee (YSAC) and the WA Coroner's Office. Coronial investigations must have been completed and the death ruled a suicide before the data is entered into the Coroner's Database.

### **2.14.1 Suicide in the general population**

The Australian Bureau of Statistics in 2004, published its third report into suicide deaths in Australia, updating previous analyses carried out in 1982, 1992 and 2000.<sup>165</sup> It reported that in Australia, between 1921 and 1998, overall suicide rates in the general population appeared to have been fairly constant with the age-standardised suicide rate for males and females in 1921 being 14.0 and in 1998, 14.3 (Figure 2-5). There were some major fluctuations in rates occurring in the intervening years especially for males. A rise in 1930 for suicides in males was attributed to the Depression and an increase in 1963 for both males and females may have in part been due to changes in the availability of sedative and hypnotic drugs.<sup>154</sup> There is a considerable gender differential with the rate for males generally being two to five times higher than that for females depending on the year.

**Figure 2-5 Suicide Rates per 100,000 persons by Year**



Taken from Australian Bureau of Statistics Suicides 1921-1998<sup>166</sup>

Males in rural areas had the highest rate of suicide, being 25 per 100,000 persons in 1988 compared with males in capital cities whose rate was 19 per 100,000 persons. By 1998 the rate of suicide for rural dwelling Australian males was 29 per 100,000 and 21 per 100,000 for males from cities. According to Ruzicka<sup>167</sup> the high suicide rate in rural areas was associated with the more frequent use of firearms, rapid technological changes and economic uncertainty.

The most recent ABS figures are for 2003<sup>165</sup> which show that the national suicide rate for the population at large using age-standardised rate for 2003 was 11.1 deaths per 100,000 population and for the period 1999-2003, this figure was 12.2.<sup>165</sup>

The rates varied for age groups. They were: 13.6 per 100,000 at 20-24 years of age, 18.0 per 100,000 for 25-34 years, 16.1 per 100,000 for the 35-44 age group, 14.4 per 100,000 for the 45-54 year group, 10.5 per 100,000 for the 55-64 age group and 11.9 per 100,000 at 65-74 age group years of age.



The rate for women was about one quarter the rate for males across most age groups. Suicide rates in older age groups have been declining and rates in younger persons have been increasing.<sup>165</sup>

The UK and US have a lower suicide rate for males in the general population than in Australia. For example, in the period 1993-95 in the UK and Ireland, the suicide rate for males was 11.6 per 100,000 and for females it was 3.4.<sup>166</sup> In Australia for the period 1992-94, males had a higher rate of 17.7 per 100,000 and for females the rate was 4.1. The age-adjusted suicide rate in the US was 11.1 per 100,000 persons in 1995.<sup>168</sup>

In Western Australia, the suicide rate for males for the period 1986-1997, was 20.2 and for females was 4.7 per 100,000 which is slightly below the national average.<sup>164</sup> Hillman *et al.* also noted that the rate of suicide for males is greater in the country while for females it is greater in the city.

A large prospective study by Miller *et al.*,<sup>98</sup> investigated the relationship between smoking and suicide of 50000 older male professionals in the US, 20% of whom were veterinarians. The suicide rate found in these professionals was about half the corresponding rate in the general US population. The suicide rates among the different health professional specialties which comprised 58% dentists, 20% veterinarians, 8% pharmacists, 7% optometrists, 4% osteopathic physicians and 3% podiatrists, did not differ significantly from one another.

The study by Miller *et al.*<sup>169</sup> found a positive dose-related association between smoking and suicide. They were not, however, able to justify that cigarette smoking caused suicide. There have also been links found between heavy alcohol consumption and depression,<sup>170</sup> and heavy alcohol intake and suicide.<sup>169</sup> The study by Hillman *et al.*<sup>164</sup> which investigated suicide in Western Australia 1986-1997, revealed that 43% of males who committed suicide, had a measurable blood alcohol content compared with 25% of females.

Of interest is that a third of the males and more than half of the females who committed suicide had been treated for a mental health illness during their lifetime. These illnesses included depressive illness, schizophrenia, drug use and personality disorder.

Overall, the type of person committing suicide is generally male, unmarried and belonging to lower socio-economic groups.<sup>164</sup>

Over the period of the survey conducted by Hillman *et al.*,<sup>164</sup> standardising for age, the most common method of suicide for males was carbon monoxide poisoning, followed by hanging and firearms. The rate of drug use was about one quarter the rate for using carbon monoxide poisoning. For females, overdose with drugs was more common, followed by carbon monoxide poisoning and hanging.<sup>164</sup>

The Australian Bureau of Statistics<sup>166</sup> reported that in the period 1979-1998, the majority of suicides involved hanging and strangulation (25% of the total); firearms and explosives (23%), carbon monoxide poisoning (19%) and poisoning by solid and liquid substance (18%). Interestingly, poisoning as a means of suicide has been falling in the general population following restrictions placed on the availability of hypnotic and sedative drugs. In 2003, hanging and strangulation was the method used for 45% of suicides followed by motor vehicle exhaust (19%), other (15%), poisoning by drugs (13%) and firearms (9%).

#### **2.14.2 Suicide in veterinarians and related professions**

Suicide in Australian veterinarians has been briefly discussed by Jeyaretnam *et al.* in a review of occupational injuries and disease among Western Australian veterinarians,<sup>5</sup> however, the authors did not obtain data about the level of suicide in veterinarians. Research from overseas indicates that there are significantly higher mortality rates for suicide in veterinarians compared to the general population.<sup>24, 25, 42, 45, 52, 171</sup> In 2000, Miller *et al.*<sup>169</sup> published findings of a prospective study of suicides occurring from 1986-1994 among several health professional specialty groups, which included approximately 10,000 veterinarians. Interestingly, their findings were that the group had a suicide rate about half that of the US general population.

Recent data from the UK<sup>52</sup> indicated that veterinarians have more than three times the suicide rate of the general population. These figures are supported in the US by a different researcher, Miller *et al.* 1960-1992 who investigated causes of death of California veterinarians.<sup>25</sup> This latter study concluded that female veterinarians had a Standardised Proportionate Mortality Rate (SPMR) for suicide of 5.89 compared with their male counterparts who had an SPMR for suicide of 2.50. Mellanby<sup>172</sup> also analysed data on veterinarians with an inquest

verdict of suicide or open verdict from 1979 through to 2000 (excluding 1981 because of incomplete data). He found the SPMR for suicides among veterinarians was 361 for males and 414 for females. Most population studies show males having considerably higher suicide rates than females. Most deaths for males occurred in the 30-49 year age group while all of the females were in the 25-39 year age range.

The 1993 and 1998 UK reports on population trends among the different professions<sup>52,53</sup> revealed that pharmacists, dentists, farmers and physicians had up to twice the expected suicide rate while veterinarians had more than three times the Proportionate Mortality Ratio (PMR).

A study undertaken by Hawton *et al.* from 1979-1995,<sup>173</sup> also in the UK, showed that suicide rates for male physicians in the UK was less than for the general population, however, females in this study also had double the rate of suicide of the general population.

In Australia, Hassan<sup>163</sup> provided annual rates of suicide for Australian males for the period 1968-1981 with medical doctors having a rate of 34.5 per 100,000 and dentists 15.5 per 100,000. The rate for doctors was significantly higher than the average suicide rate but it was not so for dentists. No figures were provided for veterinarians.

Main precipitating circumstances for suicide in Australian males aged 30-44 years, were "failure in life" followed by mental illness and financial-unemployment problems. For women less than 30 years old, precipitating circumstances were mainly due to problems with relationships with partners followed by "failure in life", and general family problems.<sup>163</sup> Unfortunately Hassan's figures for the major professions have not been updated to reflect the current situation in Australia.

Halliwell and Hoskin<sup>174</sup> have suggested that the reason why suicide in veterinarians is high, may be because the profession admits only "the most highly intelligent and gifted students" who may be very vulnerable. High IQ scores have been linked to a high suicide rate.<sup>174</sup>

Since 1997, the Australian Bureau of Statistics has been tabulating all causes and conditions reported on death certificates. Statistics have been gathered according to ASCO and as indicated previously in this chapter, the coding is not specific enough to obtain statistics on causes of death for veterinarians.

These problems are further compounded by the fact that in some states the occupation on death certificates is not recorded also making it difficult to obtain data specific for the veterinary profession. At the time of writing, there is no available data on the suicide rate for Australian veterinarians.

### 2.14.3 Method of suicide

Charlton *et al.* found that the primary method of suicide for UK veterinarians was drug overdose with other methods including carbon monoxide poisoning, gunshot, hanging and self inflicted stab wounds.<sup>52</sup> These researchers postulated that veterinarians, farmers, veterinarians, dentists and medical practitioners may have easy access to drugs, which can then be used as a means of suicide.

A more recent analysis of the methods of suicide for medical practitioners in the UK showed that barbiturates were the most commonly used means of committing suicide.<sup>175</sup>

According to Charlton<sup>52</sup> the likelihood of a person committing suicide depended on several factors that included:

- access to the means for committing suicide
- stressful life events, for example divorce
- personal factors including level of social support and attitude to suicide
- illness both mental and physical, and
- changes in the wider cultural climate including cultural attitudes and economic climate.

Schizophrenia and depression are two mental illnesses related to suicide and it is thought that 10-15% of people with schizophrenia and 15% of people with an affective psychosis commit suicide.<sup>52</sup>

Charlton *et al.*<sup>52</sup> suggested that veterinarians and also farmers might relate their ease in ending animal suffering to their own situation and this might be an explanation for the high suicide rates in farmers and veterinarians. They stated that:

*farmers and veterinarians are part of a culture where very sick or distressed animals are killed.*<sup>52</sup>

A similar hypothesis was proposed by Kinlen *et al.*<sup>45</sup>

This literature review demonstrates the paucity of data for rates of suicide for Australian veterinarians. One of the aims of the research undertaken in this study is to redress this deficit.

## 2.15 RESEARCH METHODOLOGIES FOR STUDIES

It is necessary to review the different qualitative and quantitative methodologies that are used to determine data such as incidence, risk factors and stress for occupational injuries among veterinarians. Almost all previous studies that have investigated occupational injury and disease among veterinarians have relied heavily on statistical methods to analyse these issues.

Both methodologies were used in this study. Such approaches complement each other and facilitated a more in-depth understanding of the areas under investigation.

A qualitative approach can obtain a different perspective and provide more detailed information than can be obtained by the usual quantitative data gathering process using a self-administered or survey questionnaire. Before embarking on any qualitative study however, it is necessary to discuss the meaning of this paradigm and how it is implemented.

Qualitative methodology refers to research that produces descriptive data compared with quantitative research methods where measurements are analysed using statistical tests. Qualitative research investigates individuals in their social settings providing an emic perspective about a person, incident or setting to explain actions and experiences as perceived by individuals. It attempts to obtain in-depth information from informants about their situation and their perception of these.<sup>176</sup>

An over-concern with quantitative data may lead to ignoring significant relationships with the way an individual is influenced and influences his or her environment. Taylor and Bogdan have suggested that quantification often results in meanings that are closer to the beliefs of the researchers than to those of the participants.<sup>177</sup> It could, however, be argued with equal cogency that qualitative, rather than quantitative research results in meanings that are closer to those of the researchers.<sup>178</sup>

According to Taylor and Bogdan,<sup>177</sup> a qualitative approach to research is not just a set of data-gathering techniques. It is a way of approaching the empirical world<sup>177</sup> in that:

- Qualitative researchers are concerned with the meanings people attach to things in their lives.
- Qualitative research is inductive.
- The researcher looks at settings and people holistically; people, settings or groups are not reduced to variables, but are viewed as a whole.
- Qualitative researchers are concerned with how people think and act in their everyday lives.
- For the qualitative researcher, all perspectives are worthy of study.
- Qualitative researchers emphasize the meaningfulness of their research.
- For the qualitative researcher, there is something to be learned in all settings and groups (p.10).

Amongst the qualitative paradigms, ethnography is an example of a qualitative approach which includes studies of groups of people with the aim to describe their socio-cultural activities and patterns.<sup>179</sup> This paradigm accepts that human behaviour occurs within a social context and therefore is a useful way of understanding, for example, what happens to veterinarians in their workplace whether it be at the veterinary hospital or at a farm. Developing the appropriate research tool and asking the relevant questions designed to trigger comprehensive responses is complex, but fundamental to this type of research.

According to Burns,<sup>179</sup> data collection may be supported by participant-observation, whereby the researcher immerses him/herself in the context being researched. The researcher can both modify and be influenced by this context providing them with valuable personal insight. This outcome is complex as one endeavours to avoid influencing the data gathering process. This is, however, facilitated through triangulation of data as described later.

In the past, qualitative research has been criticised for lack of scientific rigour especially in the health sciences.<sup>176, 180</sup> Some researchers consider that such research lacks validity and reliability when compared with the objective methods employed by quantitative researchers. Common criticisms are that qualitative research is anecdotal, subject to researcher bias and lacks reproducibility.<sup>180</sup>

In fact, there are a number of strategies used to ensure that qualitative research is systematic, reliable, valid and well designed. When appropriate, a rigorous implementation of qualitative methods can be duplicated, enabling other researchers to obtain similar conclusions. Mays *et al.*<sup>180</sup> suggest that when carrying out qualitative research, one may still need to use statistical sampling methods such as random sampling, but statistical representativeness is not a prime requirement when the objective is to understand the personal meaning of individuals' experiences and actions framed in the socio-cultural environment.

### 2.15.1 Use of interviews

An interview has been described as a conversation with purpose.<sup>181</sup> The purposes for doing interviews include investigating events, activities, feelings and concerns. Interviews can be categorised by their degree of structure, their degree of overtness, and the quality of the relationship between the interviewer and the participant. An interview may be structured or unstructured.

The differences between these have been well described by Lincoln and Gruba<sup>181</sup> who stated that:

*the structured interview is the mode of choice when the interviewer knows what he or she does not know and can therefore frame appropriate questions to find it out, while an unstructured interview is the mode of choice when the interviewer does not know what he or she doesn't know and must rely on the respondent to tell him or her.*

Other qualitative studies may involve collecting raw data in relatively unstructured forms through tape recordings or transcripts of conversations. To ensure retest reliability, it is important to maintain meticulous records of interviews and observations. The process of analysis should also be documented. The ready availability of audiotapes and transcripts enables independent analysis by other researchers. The reliability of analysis of qualitative data can also be enhanced by organising an independent assessment of transcripts by other skilled qualitative researchers to compare raters.<sup>180</sup> Another validation strategy, and one that was used in this study, is to have the participants check and recheck their interviews to ensure that what has been recorded accurately reflect their views.

### 2.15.2 Triangulation of data

One can ensure validity of results by using triangulation which requires that data be deliberately collected from a wide range of different sources by different methods.<sup>180</sup>

Triangulation is a strategy commonly used in qualitative inquiry and is used to enhance the validity of the inquiry. It is also a method that looks at incongruencies between what is stated and what is observed. Triangulation may be used in different ways. These can be:

- Method triangulation data (gathering data using more than two research methods);
- Data triangulation (collection of data from different sources);
- Person triangulation (collection of data at different levels: Individuals, groups, community).

The researcher needs to check the data at different levels to ensure the veracity of the information gathered. This includes sending the data back to the subjects/participants to ensure the accuracy of the transcripts.

In addition to *Phenomenology* and *Ethnography*, there are many more streams within the paradigm of qualitative approaches such as *Naturalistic Enquiry*, *Existentialism* and *Action research* to name a few.

While ethnography views the individual or group in their socio-cultural settings,<sup>179</sup> phenomenology endeavours to see things from the participant's point of view.<sup>177</sup> It also means that topics or areas are described as they are experienced and therefore relies on the individual's viewpoint, termed emic. This form of qualitative research involving both an ethnographic and phenomenological approach, can produce a wealth of data based on the participants' personal reflections and their experiences.

Patton<sup>182</sup> describes two ways in which this can occur. Firstly, the analyst can use the categories developed and articulated to organise presentation of particular themes. Secondly, the analyst may also become aware of themes for which the participants in the study did not have labels or terms to describe them. In essence, one of the values and differences between the qualitative and quantitative approaches is that the former uses an inductive analysis, which



refers to immersion in the details of data to discover important themes, categories, and keywords. It looks at inter-relationships, that is, the researcher looks for these in all responses of the participants based on personal reflection and their experiences yielded through in-depth interviews. This 'inductive' process is compared with 'deductive' analysis, which is the process of testing theoretically derived hypotheses used in qualitative methodologies.

## 2.16 CONCLUSION

In the light of shortfalls of previous studies and there being little information about risk factors for injuries, disease and suicide in veterinarians, the study was designed to combine qualitative and quantitative methodologies to determine incidence of occupational injury and disease and risk factors for occupational injury and disease in Australian veterinarians. The study concentrated on physical and psychosocial concerns. Quantitative analysis of coroners' records was used to determine the suicide rate of veterinarians.

The study design, methodologies and analyses used to determine these are described in Chapter 3. Chapter 4 presents the results of the qualitative interviews conducted in Phase 1 and, Chapter 5, presents results from Phase 2-4. Discussion follows in Chapter 6 followed by Conclusion and Recommendations in Chapter 7.

## CHAPTER THREE

### 3 RESEARCH DESIGN AND METHODOLOGY

#### 3.1 INTRODUCTION

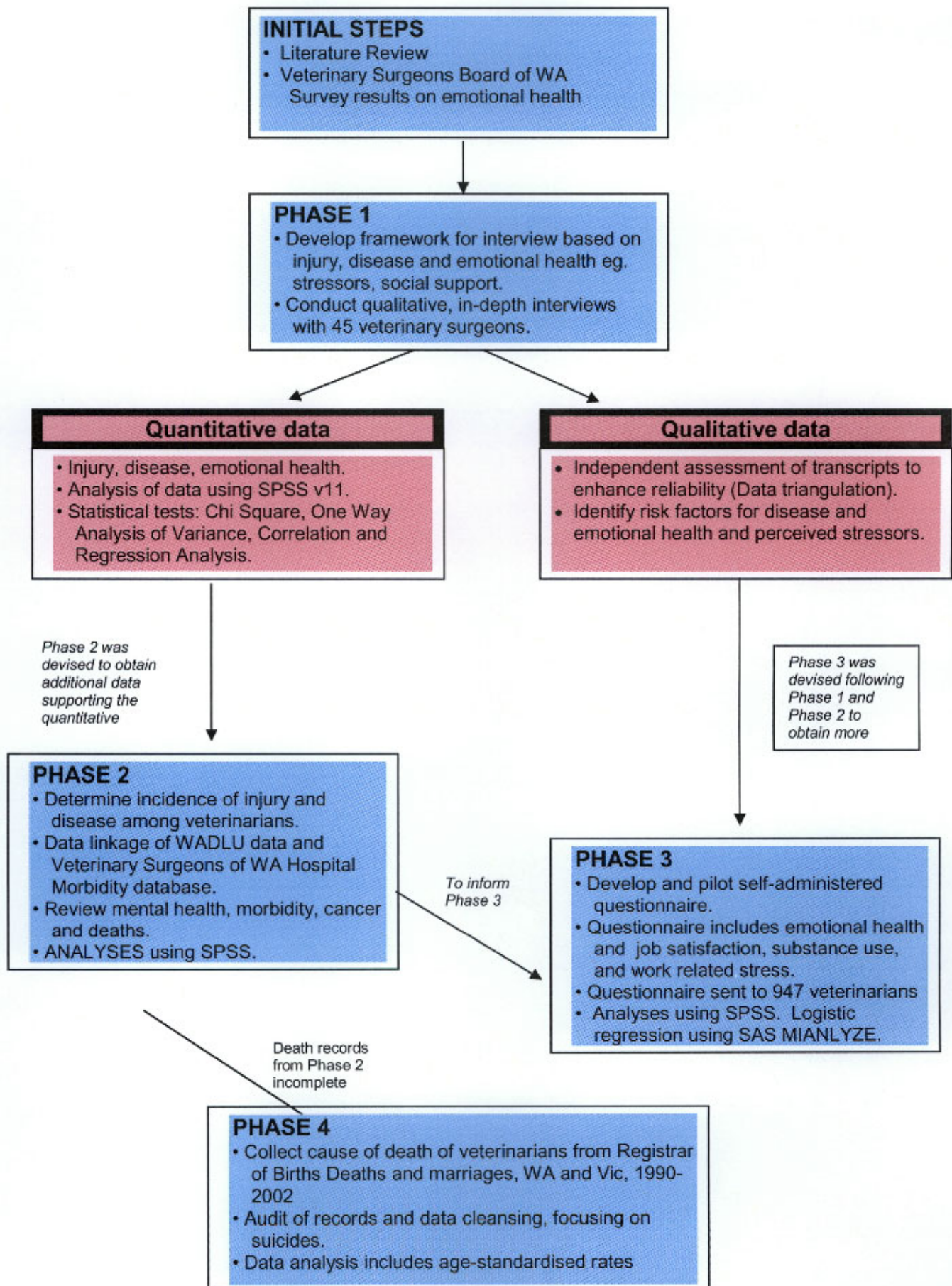
There is a dearth of data available about incidence and risk factors for occupational injuries and disease in veterinarians, especially in Australia. There have been limitations in the design of some of the previous studies that have investigated these factors.

Given these limitations and lack of available statistics, this study was undertaken to identify rates, injuries and zoonotic diseases, and severity of these among Western Australian veterinarians. Emotional health was included in the study because of its possible links to occupational injuries and disease, either as a cause, or an outcome of these. A review was undertaken to determine the rate of suicide of veterinarians in Australia.

A cross sectional, non-experimental, retrospective study design was implemented to investigate the main factors that contribute to injury, disease, associated risk factors and the influences of these on the emotional health of veterinarians. The eight objectives for the study are listed in section 1.3. To accomplish these objectives, four phases were undertaken.

In-depth interviews were undertaken with veterinarians who had been injured or who had previously contracted a zoonotic disease (Phase 1). Data collected provided information about injury, disease events, risk factors and demographic data about subjects. The second part (Phase 2) involved data linkage of the names of veterinarians with morbidity, mental health and cancer records maintained by the Department of Health in Western Australia. When insufficient data was generated to validate the results obtained in Phase 1, a survey using a mailed, self-administered questionnaire was developed and administered to WA veterinarians (Phase 3). Phase 4 involved reviewing the records of death for veterinarians in Western Australia and Victoria. The phases are described in more detail in this chapter.

**Figure 3-1 Research Design and Process**



A schematic summary of the chronological processes undertaken in the four phases to achieve the main aims of the study is presented in Figure 3.1. The main aims were: (1) To identify the risk factors for occupational injuries and disease among veterinarians, (2) Explore the emotional health of veterinarians, (3) Determine any interactions between risk factors and emotional health in this group and (4) Determine the rate of suicide in veterinarians.

The development and implementation of the instruments used in this study is described followed by descriptions of the interview protocols and questionnaires used in both qualitative and quantitative aspects of the overall study. As both methods have benefits and shortcomings, a combination of methodologies was used.

### **3.2 PHASE 1: IN-DEPTH INTERVIEWS**

The research undertaken in Phase 1 highlights the value and applicability of two qualitative methods namely, ethnography and phenomenology. This qualitative approach to the study produced a wealth of data that was recorded and written as stories of which a sample has been provided in Appendix B. Patterns and themes were identified and categories for analysis emerged from the data. These included rates of injury and risk factors for injury, disease and stress.

#### **3.2.1 Study sample**

The sampling frame for Phase 1 comprised practicing veterinarians in Australia who had incurred an occupational injury or disease, or who had emotional health issues. It excluded retired veterinarians.

Selection of veterinarians for Phase 1 was by requesting volunteers to participate in interviews and therefore, subjects were purposefully selected because of the need to explore, in-depth, how occupational injuries and disease had occurred.

A request was made through the AVA email server in late 2001 asking for volunteers willing to participate in the study to contact the researcher. As only a few veterinarians responded, a notice was placed in the VSBWA Bulletin and the AVA Newsletter in Western Australia, again requesting volunteers.

Overall, 60 veterinarians were contacted and interviews commenced. Some were not available for interview because of time constraints and one potential subject changed his mind about being interviewed because of personal circumstances. The final sample size was 45 subjects.

### 3.2.2 Data gathering

Each subject was sent a two-page questionnaire asking them to complete basic demographic data (Appendix C). They were also asked if they were willing to participate in an interview. Subjects living in close proximity were interviewed in person while others living interstate or at some distance away, were interviewed by telephone. Each interview was taped with an audio-recorder and the mean length of time taken for each interview was 45 minutes.

Information was requested about the subjects' physical and emotional experiences of their workplace.

As the researcher had knowledge of the types of facilities where subjects worked, she was able to refine and modify questions after responses by subjects. The revised content of the in-depth interview included the following trigger questions which subjects were asked to amplify:

- Career history
- Injuries received
- Details of these injuries including treatment, possible risk factors and outcomes
- Zoonoses incurred and details of these including diagnoses, treatment and outcomes
- Psychosocial emotional health including stress and suicide ideation
- Reasons for becoming veterinarians
- Safety and related lifestyle issues

When a subject reported that his/her injuries were chronic or resulted from repetitive tasks such as pregnancy testing of cattle, further questions were asked about the injuries sustained and causes. The researcher did not define injury and allowed the subjects to report on what they perceived were injuries. Subjects were invited to comment in detail about any emotional health issues, including stresses they had experienced, and their thoughts, if any, on suicide.

Asking questions about whether they knew of people who had committed suicide in a general manner led to the subject talking about whether they had ever personally contemplated committing suicide and the context in which this occurred. Subjects were also invited to comment about other issues in veterinary practice of concern to them.

Reflective questions asked were:

- Why do you think this occurred?
- How did you feel at the time the incident occurred?
- Were you taking any medication for treatment at the time?
- Did you feel that this may have influenced your emotional health?

Occasionally, it was necessary to prompt the subjects in order to stay on track. Interviews were transcribed and all data were validated for accuracy by sending the transcript back to each subject. Upon receipt of corrected interviews, these were rewritten in the third person and, once again sent back to each veterinarian for final checking and correction. On return, each interview was coded and, names and recognisable place names were changed, for the purpose of maintaining confidentiality.

The qualitative narrative accounts, transcribed verbatim, provided highly valuable information about the behaviours, attitudes and views held by the subjects. Themes were developed from these interviews including those related to possible risk factors for injury and disease. Relevant extracts were described along with data obtained about injuries and diseases.

A request had been made for volunteers to participate in the study and the sample showed that a high proportion had been injured or incurred a zoonotic disease. Having a randomly selected sample was not a major priority for this part of the study. Mays<sup>180</sup> believes that statistical representativeness is not a prime requirement when the objective is to understand social processes and in this case, the researcher was trying to understand injuries in the social context in which they occurred.

The frequencies and distribution of occupational diseases and injuries in veterinarians were accessed through a database provided by the Western Australian Department of Health (DOH).

Every patient admitted to a public or private hospital, has their condition classified and recorded. Currently, the classification uses the Australian version of the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM).<sup>168</sup> Before July 2000, two other versions were used.<sup>169</sup> This means that outputs could include cases with up to three different codes depending when they occurred. These records of injury, disease or procedures, are collated centrally by the DOH in order to provide epidemiological and statistical data on health to assist with the development of policies on health.<sup>170</sup>

The coding undertaken in hospitals is dependent on trained staff recording the correct ICD codes when the patient is discharged from hospital. This is recorded in the DOH databases maintained by the Health Information Centre. The Western Australian Data Linkage Unit (WADLU), a consortium of four partners that includes Curtin University, is able to link to these databases when research, such as the present study, is undertaken.<sup>171</sup>

WADLU linked the list of veterinarians from VSB Register with the following four databases:

1. Mental Health Information System (MHIS)
2. Hospital Morbidity Data System (HMDS)
3. Cancer (Cancer Registry)
4. Death records from the Registrar, Births, Deaths and Marriages.

It was expected that this would validate the data obtained in Phase 1. There were, however, some major shortcomings in the output obtained and these are discussed in section 3.3.5.

A brief description of these databases follows.

### **3.3.1 Mental Health Information System (MHIS)**

The MHIS has been operating since 1 July 1966 and is the oldest continuous mental health database of its kind in Australia. It contains records of inpatient and outpatient mental health services for public and private hospitals and public clinics in Western Australia. However, if patients were seen by a private psychiatrist, clinical psychologist or General Practitioner (GP), these would not be recorded either in the HMDS or MHIS databases.<sup>x</sup>

### **3.3.2 Hospital Morbidity Data System (HMDS)**

The HMDS commenced in 1970 and contains all inpatient episodes for defined admitted patients to public, private and free-standing day hospitals in Western Australia.<sup>170</sup> Data includes demographic details for each patient and medical and clinical information.

### **3.3.3 Cancer Registry**

The Western Australian Cancer Registry has been in operation since 1981 when mandatory reporting of cancer was introduced. Its role is to provide population based cancer data for use in the planning of health care services.<sup>183</sup>

### **3.3.4 Death records**

Death records have been held on a database since 1969 that comprises all deaths registered in Western Australia by the Registrar General, Births, Deaths and Marriages.

### **3.3.5 Process**

A formal approach was made to the Western Australia Data Linkage Unit to obtain the required data by linking the Veterinary Surgeons Board of Western Australia database of veterinarians registered since 1994, with the records held from the four databases. In 1994, records for all registered veterinarians were computerised.

The application to link the names of veterinarians with the DOH databases had to first be approved by the Curtin University of Technology Human Research



Ethics Committee followed by the DOH's Confidentiality of Health Information Committee (CHIC).

The names of 1323 people registered as veterinarians from 1994 to the present, were provided from the VSB Register and linked by WADLU with the four databases. A list of individual root codes and the cases of injury and disease recorded for each was generated. Data output was provided to the researcher on CD-ROM in DOS/Windows Format and in SPSS format. The information was reviewed to obtain frequencies, means and other descriptive statistics from the output provided by WADLU for the four databases. The researcher ignored the records for persons under the age of 22 because it is highly unlikely that there would be any veterinarians graduating from a five-year undergraduate degree younger than aged 22.

The database output from WADLU for morbidity and mental health included the following for each patient record:

- Record type: MHIS or HMDS
- Root or patient identifier
- Case identifier
- Age at contact
- Gender
- Suburb
- Postcode
- Marital status
- Admission date
- Discharge date
- Principal Diagnosis

The first record for a veterinarian in the HMDS occurred in 1971 and the last in 2003 when the data linkage occurred, a span of 32 years. The HMDS provided information on injuries and diseases of individuals using the principal diagnosis codes, however, there were thousands of different conditions, many of which were similar. In this form it was difficult to obtain useful statistical data about diseases or injuries affecting veterinarians.

Data were manipulated to remove duplicate records so that there was only one record per person per principal diagnosis. For example, an output record from the linkage for a patient with the specific root code, DUX36WSEZPD30 was for

a 22 year old male first admitted into hospital in 1983. His principal diagnosis was schizophrenia (F607). There may have been 156 records for this patient with schizophrenia or slightly differing diagnoses; hence the output required further reduction to obtain meaningful data. This involved grouping the diseases into common themes such as mental health, knee injuries, urinary tract infections and heart disease. Those groupings were reduced to 40 primary categories, which meant that a case like DUX36WSEZPD30 would occur in one mental health category only.

As some primary conditions or diseases are very broad such as female reproductive conditions, births, labour problems and teeth conditions, these were not considered in subsequent analyses because of an inability to determine their aetiology.

With the Death records, the root codes for each death were checked with the HMDS and the MHIS to establish if any of the dead veterinarians had a clinical history of mental health.

A number of problems were found from the data linkage. The list of registered veterinarians was only placed in a database from 1994 and hence, veterinarians who were no longer registered, or who had died prior to that, were not included. Additionally, the date of birth of veterinarians was not recorded in the Register and therefore could not be used for cross checking where duplicate names were found during data linkage. A different spelling of one's name when entering a hospital results in a new root code for an individual being entered into the database.<sup>9</sup> Married or divorced females may use a different name to the one used when practicing veterinary medicine.

For these reasons, the data outputs for cross linkage with the four DOH databases are likely to be a major underestimation of records for hospital admissions for veterinarians in WA.

### 3.4 PHASE 3: SELF-ADMINISTERED QUESTIONNAIRE

A questionnaire was pilot-tested with eight veterinarians and a clinical psychologist and, after feedback was incorporated, the final instrument was developed. The eight-page instrument elicited standard demographic details and information about veterinarians' work including emotional health, job

satisfaction and general psychosocial well-being and drug taking. The questionnaire also requested details about injuries (Appendix E).

### **3.4.1 Study sample**

The finalised questionnaire was sent to 930 veterinarians on the VSB Register in Western Australia with an explanatory letter (Appendix D). This included an estimated 100 veterinarians who had retired but who remained on the register.<sup>2</sup> The questionnaire was also sent to the additional 17 subjects from other states in Australia who had participated in Phase 1. Those questionnaires sent to the 45 subjects interviewed from Phase 1 were checked separately to determine their demographics were similar to those of other respondents.

### **3.4.2 Questionnaire**

The questionnaire was divided into eight sections comprising 53 questions, some with subsections, which requested information on the following:

1. Demographics
  - Years worked as a veterinarian
  - Age group
  - Social marital status
2. Work-related factors
  - Type of veterinary employment
  - Practice ownership or employee (associate)
3. Environmental factors
  - Animals worked with
  - Travel to and from cases
4. Injury and diseases incurred
5. Emotional health factors
  - Job satisfaction
  - Happiness
  - Anger

- Perceived stress
  - Stressors in practice
  - Substance use
6. Selection of veterinary science as a career
  7. Frequency of medical checkups
  8. Female veterinarians and perceived risks

The demographic questions requested standard demographic information and requested information about *major acute occupational injuries requiring half a day or more off work*. This injury definition was not as prescriptive as that used by Gabel in her study of Minnesotan veterinarians.<sup>12</sup>

Assessing emotional health proved to be a challenge because there is no single scale that assesses emotional health. A review of the various scales for emotional health led to using the Kessler 10+ scale for assessing psychological distress because it has been used in Western Australia, New South Wales and nationally to assess the mental health of the general population. The Kessler 10+ scale was described in the Literature Review and is incorporated in the questionnaire used in Phase 3 (Appendix E).

The K10 requests responses on frequency of experiencing certain feelings in the previous 4-week period using a 5-point Likert scale ranging from a scale of 1 for *none of the time* through to 5 for *all of the time*. The minimum total score is 10 and the maximum, 50. Levels of psychological distress are termed *Low* if the participants score between 10 and 15, *Moderate* if between 16 and 21, *High* if between 22 and 29 and, *Very High* if between 30 and 50.<sup>144, 149</sup> People who score 20-24 are likely to have a mild mental disorder, people who score over 30 are likely to have a severe mental disorder.<sup>149</sup> The scale is used by clinicians as a screening instrument although it is also used to assess levels of mental disorders in the community.<sup>157, 184</sup>

An extra four questions make up the K10+ and is collated for individuals whose scores on the K10 are 15 or more. These questions inquire as to how the individual has been affected in the previous 4 weeks because of their feelings.

The K10 and K10+ scales are usually administered using personal interview or by telephone. These days, the administration of K10 questionnaires is often

computer assisted and Australian population data is now available using such computer assisted survey data. However, the budget for this study precluded the administration of either. Kessler<sup>aa</sup> and Stewart<sup>bb</sup> recommended that a study comparing telephone responses with self-administered responses, be undertaken. As a result, a validation study using a test-retest methodology was undertaken with 25 veterinarians attending the Australian Veterinary Association-Murdoch Trade Fair on September 15, 2004. An independent person contacted each veterinarian within a week of their completing the self-administered questionnaire to ask the same questions, first ascertaining that personal circumstances had not changed since they had filled in the written questionnaire. Twenty-five paired responses were obtained (self-administered and telephone response). Comparisons were made for the 10 questions and total score. The responses from the self-administered responses and those from the telephone interview for each of the ten questions were very similar except for two missing values for one question for the self-administered survey. There was a high level of agreement between the two sets of data and which was supported by a high Kappa Coefficient. This reassuring result supported comparing the data obtained in the research for psychological distress with state and national statistics.

A Job Satisfaction Scale was included as another indicator of emotional health. The scale was adapted from that used by Warr Cook and Wall<sup>137</sup> and was modified slightly so that the questions related to veterinary practice.

Questions on drug usage were included in the final questionnaire as drug usage is often an indicator of emotional health and may be a risk factor for injury. The questions were a modification of those used in the 2001 National Drug Strategy Household Survey.<sup>173</sup>

### **3.4.3 Process of data gathering**

Pilot testing was undertaken for two weeks during April 2004 and the finalised questionnaire was sent out at the end of May 2004 and remained open until September 30, 2004. Financial and time constraints precluded posting reminders to encourage veterinarians to respond to the mailed self-administered questionnaires. However a note in the Veterinary Surgeons

Board Bulletin produced an additional 12 responses. The final data set comprised responses from 419 veterinarians, a return rate of 43%.

### 3.5 PHASE 4: DEATH RECORDS

Phase 4 was undertaken to determine the causes of death and estimate the rate of suicide of veterinarians.

Records for causes of death among veterinarians were obtained directly from the Registrars of Deaths in Western Australia (RDWA) and Victoria (RDVIC). Both of these states list the profession of persons who have died except where the deceased has retired. This resulted in a list of names of 109 "vets" who had died since 1989. The listing for "vets" also contained data on retired services personnel. When these were removed, the resultant 104 names comprised veterinarians, veterinary assistants, veterinary nurses and veterinary technologists. The records for all non-veterinarians were removed resulting in 89 records for veterinarians. There were three veterinary nurses who had committed suicide in the original list of 109 and these are reported upon separately. Twenty nine percent of the records for veterinarians were from WA, 69% from Victoria, and 2% from elsewhere.

In WA, the RDWA provides information about cause of death and whether it was accidental, suicide, or an open finding. The RDVIC provided only the cause of death, without designating suicide unless the person indicated they were going to kill themselves. This difference made it difficult to identify whether a death may be categorised as suicide.

It has been estimated that there are 8-25 attempted suicides (parasuicides) to one completed and approximately two attempts per 1000 people per year.<sup>185</sup> This study did not determine the number of parasuicide attempts from subjects in Phase 1 or respondents in Phase 3.

### 3.6 DATA ANALYSIS

The program, SPSS 11 for Mac OS X (SPSS Inc) was used for data analyses during all four phases of the study. The SAS procedure MIANALYZE<sup>186</sup> was used to undertake Logistic Regression using multiple imputations for missing data. Statistical modelling used in logistic regression aims to calculate the

independent effect of each variable model after adjusting for all other variables in the model.

Descriptive statistics such as means and frequencies, parametric and non-parametric tests including Chi-square, One way Analysis of Variance (ANOVA) and Logistic Regression were used with analyses. Normality tests were done for all variables and where there was asymmetry, the equivalent non-parametric tests were undertaken.

Where the frequency of the cells was low (<5), Fisher's exact test was used instead of a Chi-squared test. The level of significance for all parametric tests was established at 5% levels.

In the research literature, suicide rates have been reported in three ways:

- Age-standardised rate or age-standardised mortality ratio (ASR)
- Standardised mortality ratios (SMR)<sup>164</sup>
- Proportionate Mortality Ratio (also written as Proportional Mortality Ratio (PMR)).<sup>172</sup>

In determining the suicide rate in this study, ASRs for suicide were derived with the assistance of Lawrence<sup>cc</sup> using the Rates Calculator developed by Codde.<sup>174</sup> The expected number of cases was estimated by applying state, and age specific rates to the population.

Logistic regression, using imputation for missing values, enabled all cases to be entered into the logistic regression models. Most statistical procedures exclude missing values for analyses and SAS has developed MIANALYZE<sup>186</sup> to generate valid statistical inferences to analyse the results of the multiple imputation.

By imputing multiple times and then averaging the results, the effects of the imputation on the results were minimised. At the same time, the statistical power of the available 419 records from Phase 3 was maximised.<sup>dd</sup>

### 3.7 ETHICAL CONSIDERATIONS FOR ALL PHASES

All phases of the study were reviewed and approved by the Curtin Human Research Ethics Committee. In addition, Phase 2 was reviewed and approved

by the WA Department of Health Confidentiality of Health Information Committee (CHIC).

Phase 1 subjects volunteered to participate. They were guaranteed that their responses would remain confidential and anonymous.

Subjects agreed to participate in the study using email or telephone. Potential subjects were sent information describing the study and how confidentiality would be maintained. They were informed that they could withdraw from the study at any time. They were then sent a two-page questionnaire (Appendix B), which also reinforced confidentiality. They returned the form and indicated when they were available for interview. They were not asked to sign consent forms as the return of the questionnaire indicated their availability and was taken as informed consent. At the commencement of each interview, the subjects were reminded that they were being recorded on tape and that confidentiality would be maintained with nothing published that could identify them. This process was repeated each time the transcribed interview was sent back to participants for checking. Subjects were assured that de-identification of the interview would occur after final checking. All data records and hardcopies of all phases were managed in accordance with the requirements of the Curtin Human Research Ethics Committee and the DOH's Confidentiality of Health Information Committee.

### **3.8 SUMMARY OF RESEARCH DESIGN AND METHODOLOGY**

The study sample or data source, the process of collection and ethical considerations, have been described for each of the four phases.

The following two chapters present the results obtained from the in-depth interviews and from the analyses of the questionnaire.



# CHAPTER FOUR

## 4 RESULTS PHASE 1

### In-depth Interviews

The results of the four phases of this study are presented in the following two chapters. Chapter Four contains the results from the in-depth qualitative interviews together with data quantified from these interviews. Chapter Five presents the quantified statistical results from Phases 2, 3 and 4.

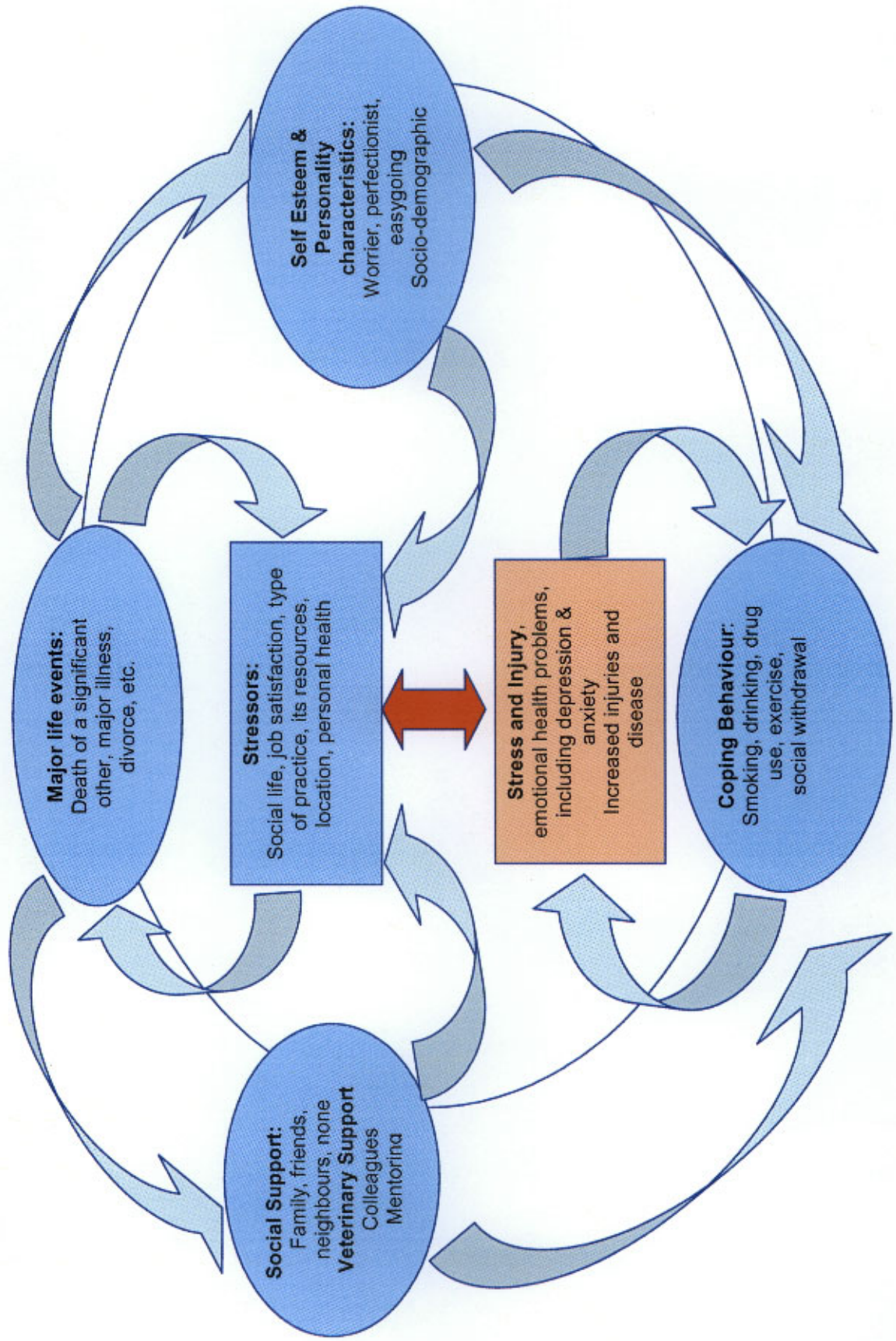
It assisted the researcher to develop a figure showing risk factors that might contribute to injury and stress before analyses of the results were undertaken. These risk factors are shown schematically in Figure 4-1. The interviews revealed much about stressors for subjects including major life events. They also revealed the coping strategies used which included social support availability. Personality characteristics were not investigated, although several subjects revealed that part of their stress might have been due to their compulsive nature.

Phase 1 involved using a qualitative approach to determine the major injuries, diseases and the risk factors that these veterinarians experienced as part of their everyday work. This approach used in-depth interviews to gain information about occupational injury and disease from a diverse group of 45 practicing veterinarians. Having personal interviews jogged the memories of some subjects about serious injuries they had forgotten to include when they responded to a recent written questionnaire about occupational injury undertaken by Fritschi *et al.*<sup>187</sup>

Selections of the verbatim in-depth interviews are presented in Appendix B. It is not possible to include all transcribed stories because of their volume. These will be published separately. All are available on request as part of this research. These narrative accounts provided highly valuable information about the behaviours, attitudes and belief systems held by practicing veterinarians.

Highlights of injuries, disease and emotional health concerns have been extracted from these interviews. A summary of the interviews with respect to injuries and diseases, including emotional health status or stress as indicated by the subjects is provided in Table 4.2.

**Figure 4-1** Potential contributors to impaired emotional health and injury in Phase 1 Subjects



#### 4.1 DEMOGRAPHICS

Twenty-eight subjects were from Western Australia and 17 from interstate.

**Table 4-1 Age profile of subjects by gender**

Age group	Female (n)	Male (n)
< 25 years	0	0
25-34 years	4	2
35-44 years	9	7
45-54 years	1	14
55-64 years	0	7
>64 years	0	1
Total (n)	14	31

The mean age for male subjects was 49 years while for female subjects was 38 years (Table 4-1). Most were in the 35-54 age group and male. No female subject was over 55 years and 93% of females were less than 45 years of age, while only 29% of males were less than 45 years old

Extracts from individual interviews are presented in the following sections and as previously indicated, the subjects are referred to by pseudonyms to protect confidentiality.

Subjects were asked about acute and chronic injuries. Where injuries were chronic, or as the result of repetitive tasks such as pregnancy testing of cattle, further, more specific questions were asked about the resulting injuries. They were also asked about zoonotic diseases and any emotional health issues.

Throughout the interviews, a substantial proportion of subjects indicated perceived levels of stress. These have been described as part of a more pervasive emotional vulnerability that appeared to be directly linked to the subjects' work environments.

The frequency distribution of injuries, diseases and stress perceived by subjects are summarised in Table 4-2. No attempt was made to determine the level of stress experienced by subjects. Where subjects mentioned they had had suicidal thoughts while working as a veterinarian, this has also been included. Some subjects volunteered information that they had actually attempted suicide however questions were not specifically asked about frequency of suicidal thoughts and the number of unsuccessful attempts.

Table 4-2 Summary of subjects' injuries, zoonoses, perceived stress and suicidal thoughts

No.	M/ F	Name	Injury from small animals	Injury from large animals	Disease	Perceived stress	Suicidal thoughts
1	F	Jane	Neck injury from lifting dogs			Yes	No
2	M	James	Dog bites (4)	Goring by cow in race and partial circumcision		Yes	Yes
3	M	Dennis	Black Labrador almost bit eyelid off Whelping bitch bit face	Bruising in cattle races Knocked unconscious by horse striking head while filing teeth		Yes	No
4	F	Elise	Cat bites (several)			Yes	Yes
5	M	Tom	Dog bite Dog bite	Hit on head resulting in concussion while working in cattle yards Trampled on resulting in bruising Cuts while castrating horses Broken ribs from cows in yards Broken ribs from cow in crush Horse fell on him injuring his back	Brucellosis	Yes	No
6	M	Robert	Dog bites (2) X-rayed himself	Calving hook through hand - doctor sewed up Hoof trimming knife cut palm of hand - self sutured Damage to knees trying to use them to get a downer cow up Wrenched knee when foot stuck in mud working in cattle yards Fractured ankle from cow Charged by bull after xylazine injection - severe periosteal bruising to pelvis Pregnancy testing heifer in race. Kick to chest, head, knocked unconscious Sprained wrist when cow went down in rotary dairy Calving jack being used on cow, slipped and hit him on head fracturing his skull Trimming cow's foot with trimmer & kicked giving black eyes De-worming horse which struck head giving whiplash Cow tried to kill him when treating calf, knelt on his chest 3 cows in race knocked him down giving severe bruising sacroiliac joint of pelvis Cut hand from scalpel while castrating stag Cow kick to knee, fall to ground injuring elbow- chips in elbow Pregnancy testing cattle, cow hit in chest fracturing ribs Chute crank handle hit hand when hoof trimming, dislocating metacarpal-pharyngeal joint Car accident. No injury but son killed	Leptospirosis Giardia Cryptosporidiosis	Yes	Yes

Table 4-2 Summary: injuries from small and large animals, zoonoses , perceived stress and suicidal thoughts (continued)

No.	M/ F	Name	Injury from small animals	Injury from large animals	Disease	Perceived stress	Suicidal thought
7	M	John	Dog bite to neck after dog run over. Dog bit hand sutured by doctor, tetanus inject. Severe dog bite to hand. Sutured himself when couldn't find a doctor. Sedated dog bit thumb during anaesthesia Scar fr. dew claw of Red Heeler that raked arm. Assault in practice of staff member.			Yes	No
8	M	Mike		Broken wrist from sport. In plaster and exacerbated when working with sheep Knee injuries from sport exacerbated by large animal work		No	No
9	M	Sam		Numerous kicks from horses but only bruising no breaks Kick to jaw by horse knocking him unconscious	Brucellosis Allergic to horses	No	No
10	M	Craig		Chronic injuries from pregnancy testing cattle	Q Fever	Yes	No
11	M	Gerard	Siamese cat bit through nail and thumb Dog bites (10)	Calving cow in race cow pulled back crushing ribs broken ribs Hoof trimming 3 cm cut to palm Cow in rotary dairy sat on arm when pregnancy testing, ruptured ligaments & dislocated elbow Calving hook went through hand Knocked unconscious by gate that was hit by bull. Believed it was farmer's fault	Leptospirosis	Yes	No
12	M	Simon	Psychotic bull terrier bit leg Many dog bites	Broken toes from horse stomping on them Broken ribs from ram charge Concussion twice from being knocked out by horses' back legs Dislocated elbow from calving when cow collapsed and went down Broken leg when horse he was x-raying lashed out and connected with his leg	Q Fever	Yes	No
13	M	Jarrad	Dog bite resulting in a ruptured artery.			Yes	No
14	F	Lynette	Massive cat scratches down arms and hands	Car accidents -fatigue (twice) Crushed by cows while in race - bruised ribs - farmer's fault Cow attack while in race-ruptured ligaments both ankles. 10 weeks off work. Blamed farmer Knife cuts at abattoir	Pneumonia from holding cow's head out of water to prevent drowning.	Yes Yes	Yes

Table 4-2 Summary: injuries from small and large animals, zoonoses, perceived stress and suicidal thoughts (continued)

No.	M/ F	Name	Injury from small animals	Injury from large animals	Disease	Perceived stress	Suicidal thought
15	M	George	Injury from small animals	Injury from large animals Broken ribs TB testing cattle. Cattle sent down race while he was working Bruising from TB testing cattle Needle-punctures from vaccinating cattle		No	No
16	M	Chris	Scratches from cats Dog bite severing radial artery Dog bite to nose	Jumped fence and injured foot when landing Kick on knee by horse	Psittacosis	Yes	Yes
17	M	Daniel		Sprained ankle when doing cattle work Torn cartilage in knee while doing cattle work		No	No
18	M	Nick		Cut wrist doing a post mortem		Yes	No
19	M	Mark		Repetitive Strain Injury from computer work Fractured bone in hand when crushed by cow Kicked in head by horse Kicked in head by cow Needle-punctures (many)	Severe reaction in hand to botulism vaccine	No	No
20	M	Dean		Aircraft accident causing 3 fractured bones in foot, ruptured cruciate, fractured patella, fractured and dislocated hip, right ear almost severed Knocked unconscious by horse Striking horse broke radius lower arm Farmer ran 2 <sup>nd</sup> cow down race while he was working causing him a fractured knee		Yes	No
21	M	Ian		Kick from horse to knee. Severe bruising Horse "cow kicked" hitting thigh, also winded Kicked in chest & abdomen by horse under xylazine. needed RFDS & nearly died.		Yes	Yes
22	F	Kate	Bitten on hand by Rottweiler Needle-punctures (several)		Skin allergies	Yes	No
23	M	Dominic		Multiple cuts-sutures himself, only when on left hand because he is right handed. Yearling calf rolled on his knee straining medial ligament Cow threw her head at knee rupturing ligaments needing total knee reconstruction. Many broken and dislocated fingers	Brucellosis Q Fever	No	No
24	M	Stephen		Scalpel through arm severing nerves and blood vessels Horse in race kicked backwards giving broken jaw Horse fell on him breaking ribs, cracked sternum. Horse being dewormed, kicked him in the chest and crushed foot Broken ribs, bruises from working with cattle several times	Brucellosis	No	No

Table 4-2 Summary: injuries from small and large animals, zoonoses, perceived stress and suicidal thoughts (continued)

No.	M/ F	Name	Injury from small animals	Injury from large animals	Disease	Perceived stress	Suicidal thought
25	M	Aaron		Injury from large animals Cut hand while castrating colt (10 stitches) Disk problem in back from lifting dog and calving -hospitalised and had surgery which was successful but took 1 yr to fully recover	Sjogren's Disease Reaction to Q Fever vaccine	Yes	No
26	F	Louise	Dog bite to arm when routinely vaccinating Rottweiler bit forearm- hospital treatment Anaesthetised Gt Dane bit hand intubating it	Arm crushed in gate when cow head butted her while doing caesarean Horse reared up and fell injuring her back- severely bruised lumbar muscles Hyperextension elbow while pregnancy testing - cow was able to move sideways in crush	Q Fever titre but no clinical signs Aborted -28 wks not checked why	Yes	No
27	F	Jessica	Cat scratches (several) Alaskan M'mute bit head causing bleeding to gums & bruising Strained wrist from fall in clinic. Can't lift big dogs			Yes	No
28	M	Jack	Cat bites and scratches - often Dog bites (2 major ones)	Badly bruised when knocked over by charging cow down race while pregnancy testing Kick from cow to abdomen (in herringbone shed) Kick to thigh from cow (cork) (herringbone dairy) Many kicks to legs from cows but not horses	Brucellosis Q Fever	No	No
29	F	Sarah	Broken nose from putting dog in kennel Dislocated finger from spaying dog Cat bites-several Rottweiler bite to backside during home visit Dingo bite to thigh during farm visit Dog bites (several) and treated herself	Severely damaged ligaments on middle finger of hand during dental work on horse when gag broke jamming her hand in horse's mouth After a foaling, she and farmer were lifting foal when farmer let go giving her all weight - ruptured IV disc giving bad back. No workers' compensation.	Allergies to cats	Yes	Yes
30	F	Ali	Bite from cat on knuckle. Needed antibiotics Nurse's lack of restraint, cat bit vet's knuckle- requiring antibiotics for treatment.	Removing horseshoe with nails and horse pulled back and nail ripped hand. Horse stood on big toe giving blackened nail. Nail removed surgically		Yes	No
31	F	Christie		Hit in face with pig tattooer "5" on forehead. Needed tattoo to be lasered off	Allergies Sinusitis Hearing problem	Yes	No
32	M	Luke	Bitten on thumbs by dog when muzzling it Bad scratch from rabbit Cat bit inner arm while he tried to restrain it		Paravaccinia (Milker's Nodule) As a student	Yes	No

Table 4-2 Summary: injuries from small and large animals, zoonoses, perceived stress and suicidal thoughts (continued)

No.	M/ F	Name	Injury from small animals	Injury from large animals	Disease	Perceived stress	Suicidal thought
33	M	Matt	Injury from small animals	Injury from large animals Kicked by horses when tubing them. Double barrelled kick to leg. Injured back while putting back prolapsed uterus into cow	Aneurism (congenital) vaccine reaction to anthrax	Yes	Yes
34	F	Jennifer	Cat bite to thumb - infected. antibiotics	Injured back when horse being stomach tubed reared up. Only muscle damage. Pregnancy testing and cow went down hyperextending his elbow	Sporotrichosis From cat bite	Yes	Yes
35	F	Claire	Cat scratch, ligament torn, finger permanently bent Bite to thigh from Chow dog		Vit C deficiency Q Fever	Yes	Yes
36	M	Jason		Car accident because fell asleep from fatigue Car accident causing bruised knee and bleeding ear. Bad cut from castrating horse when horse kicked scalpel Horse kick broke arm			
37	M	Alan	Sedated cattle dog and bitten while removing muzzle -more a reflex than deliberate action	Kicked in chest and wrist by horse after tubing it. Horse struck shoulder	Q Fever Scabies from dog	Yes	No
38	M	Paul	Damaged back from lifting animals brought end to veterinary career		Leptospirosis	Yes	No
39	M	Gavin		Lacerated hand while loading cattle. Needed sutures Broken nose when heifer charged him	Psittacosis Giardia	Yes	No
40	M	Jacob		Pregnancy testing in race and cow charged him causing a cracked sternum, torn ligament and chipped knee, ankle injury, concussion, split lip. Taken to hospital Double barrel kick knee from horse being castrated	Melanoma	Yes	No
41	M	Ryan		Ruptured a disk in his back from using calving jack with pressure but cow at wrong angle - had to quit large animal work because of it. Broken thumb when hit by ram in crush Cuts to hand when bang tailing cattle (2)		Yes	No
42	F	Danielle	Scalpel blade cut to hand for dog's dew claw Cat bite became infected when didn't treat Puppy jumped -scratched her arm Bitten when prising dog's mouth open to insert	Corked thigh from steers hitting gate with him behind -off work 2 days Many kicks from cattle - bruising		Yes	No
43	M	Brett	Slipped injuring his neck and back of his head and C6 disk collapsed affecting muscles producing weakness in left arm	Fell from one rail to next in yards when TB testing causing bruising to rib cage especially the sternum which still hurts	Giardia (twice)	No	No



Table 4-2 Summary: injuries from small and large animals, zoonoses and perceived stress and suicidal thoughts (continued)

No.	M/ F	Name	Injury from small animals	Injury from large animals	Disease	Emotional health " stress"	Suici dal
44	F	Karen	Cat scratches and bites- several			Yes	Yes
45	F	Maggie	Cat bites (several)	Back injury from doing heavy large animal work		Yes	Yes

A summary of injuries and disease that have occurred when subjects were working with small or large animals is provided in Table 4.3.

**Table 4-3 Injuries and diseases incurred from large and small animals**

Incurred from	Injuries and Disease		
	Acute	Chronic	Disease
Small animals	26	6	4
Large animals	29	24	16

There were many more chronic injuries and zoonotic diseases in those subjects working with large compared with small animals. Fifteen subjects working with large animals had incurred major zoonoses compared to only two with small animals. Another two subjects had sustained severe reactions to accidental injection of vaccines.

#### 4.2 CAREER CHOICE

Subjects were asked what contributed to their choice of becoming a veterinarian. The majority of subjects indicated they had made their decision to become veterinarians at a young age and then they set out to achieve their goal. Fifteen subjects (33.3%) said they loved animals, seven (15.6%) indicated they had other careers prior to becoming veterinarians, mainly working as agricultural technicians, and were still involved with rural veterinary practice.

Ten subjects (22.2%) were from farming backgrounds and all were still working in rural private or government sectors.

Two subjects would have preferred to study other areas; teaching and art, however, parental pressure meant they had to take up science as a career and they chose veterinary science. One of these now works part-time as a veterinarian and dabbled in his "first love", art.

One subject, Dennis, wanted to become a veterinarian since he was 12 years old when he first saw a veterinarian treating a horse. He initially worked as a strapper for a racing trainer and later went back to school and successfully matriculated in order to achieve his goal. He applied to veterinary schools in Australia and was accepted into one of these.

One female, Jane, initially planned to undertake a medical degree but changed her mind at the last moment because she realised how much she preferred

animals to people. She said she would have been devastated if she hadn't been accepted into the course. Her views recorded below were quite typical of the female subjects interviewed especially with regard to her love of animals and how much one earns as a veterinarian:

*You have to love animals to be a vet. Why else would you want to do it? It's not exactly the best-paid profession, is it?*

### 4.3 INJURY

#### 4.3.1 Subjects and case mix of animals

Veterinarians work with small animals, large animals and mixed animals. The latter term encompasses both small and large animals. For descriptive purposes, the term *case mix* is used to describe small animals, large animals or mixed animals (Table 4-4). Some subjects had recently changed from working with mixed animals to small animals or to management because of occupational injuries. There were four government veterinarians, one university veterinarian and three consultants who were classified with the animal species they had worked with. One other college lecturer worked with small animals.

Most of the subjects interviewed had worked with mixed animals (60%), while 18% had worked exclusively with small animals and 22% with large animals.

**Table 4-4 Percentage of subjects working with case mix**

Case mix of animals	n	%
Small animals	8	18
Large animals	10	22
Mixed animals	27	60
Total (n)	45	100

A summary subjects who indicated stress at the time of the interview and who indicated suicide ideation is presented by type of animal worked with (case mix)(Table 4.5).

**Table 4-5 Perceived stress and suicidal thoughts by case mix of animals**

Case mix of animals	Perceived stress and suicidal thoughts	
	Perceived stress (n)	Suicidal thoughts (n)
Small animals	8	3
Large animals	6	2
Mixed animals	22	7

Four subjects indicated they were allergic to horses or cats and 76% indicated they had varying levels of "stress". In the interviews, 27% of subjects indicated they had considered committing suicide at some time during their working lives.

Injuries, diseases and emotional health issues are explained further in this chapter.

Overall, 35 (77%) of the subjects had worked with small animals and 37 (82%) with large animals, during their professional careers. The subjects working exclusively with small animals all stated that they had been bitten or scratched by a dog or cat. Two of these veterinarians had received back injuries. Of the mixed animal veterinarians, 56% had been bitten or scratched working with small animals while 91% of those working with large animals, had been injured.

The number of subjects who reported receiving acute and chronic injuries when working with small and large animals is documented in Table 4-6. The table also shows the proportion of subjects working with small, large and mixed animals, who were injured.

**Table 4-6 Acute and chronic injuries from small and large animals**

Injuries incurred	Subjects*	As a proportion of working with small or large animals (%)
	n	
Small animals: acute	26	74
Large animals: acute	29	78
Small animals: chronic	6	17
Large animals: chronic	24	65

\*Subjects may be represented more than once having incurred acute and/or chronic injuries from small and/or large animals.

Most subjects (74%) who dealt with large animals sustained three or more major injuries whereas only 25% of those working with small animals experienced three or more injuries.

One subject sustained a chronic injury not directly involving animals, but the injury was occupational. This involved repetitive strain injuries to the subject's wrist, elbow and shoulder. The injuries were aggravated by doing intense work on his computer at a time when there was little recognition of the condition.

Descriptions of how injuries were incurred are presented under the headings of small animal and large animal injuries, motor vehicle and aircraft accidents. Needle-puncture injuries were common to both small and large animal veterinary subjects and are described separately.

As indicated previously, pseudonyms are used for anecdotal data presented.

#### **4.3.2 Injuries from small animals**

The most common injuries were dog and cat bites and scratches. Both male and female subjects appeared to be bitten and scratched with equal severity. There was one case of a severe scratch from a rabbit. The majority of subjects received only one or two major bites in their lifetime. Only three subjects had received more than four injuries. Mostly subjects misjudged the nature of the animal they were treating. A selection of anecdotes about these bites is presented.

1. Tom readily recalled the day he misjudged the nature of the Cocker Spaniel and was badly bitten when he was about to vaccinate it against Canine Distemper and Hepatitis:

*It looked at me with its big doleful eyes when I went to pat it and in a flash, it bit me so hard that one of its rotten teeth broke off in my hand!*

2. Jessica also was bitten by a dog she had known since it was a pup and thought was friendly. She recalled:

*I was on the ground with the dog ... It was an Alaskan Malamute and it was coming in for vaccination. It growled at me and I let it go and did the other dog from the same family and then I went back to do it and it growled again. I can't lift heavy dogs and it was too big to lift. I rolled it over to pat its*

*belly and it lunged at my head and its top jaw went into my forehead and its bottom jaw went into my mouth. I didn't seek medical assistance. The owners were present and were utterly shocked. They then told me that they had previously had behavioural problems with the dog. They admitted they had a dominance problem with the dog occasionally but apparently I was the first person it had ever attacked.*

Some of the subjects stated that they had been bitten many times but were only able to provide details about one or two bites that caused serious damage.

3. John, said he was bitten several times and especially remembered his first dog bite:

*I went in to examine it and was probably not as cautious in those days as I am now. I didn't have a muzzle or anything like that on it. It just whipped around and bit me on the neck leaving me bleeding with teeth marks.*

The bite was from a dog that had been run over, and since then John has been bitten twice on the hand by dogs. On one occasion he was bitten on the thumb from what he thought was an anaesthetised Rottweiler dog when he was checking the depth of anaesthesia.

4. Louise was also bitten by a dog when she went to check its depth of anaesthesia.

*I was bitten on my thumb when I was trying to intubate a Great Dane to anaesthetise it to relieve a gastric dilatation. I had knocked it out to try to tube it and put a stomach tube down there to relieve the dilatation but it wasn't quite as asleep as I believed.*

5. Danielle was bitten when trying to secure a gastric lavage tube in an old dog, on this occasion, without using anaesthesia.

*I decided because of the condition of the dog it would be better to try without anaesthetising it. We tubed the dog with a stomach tube and ... the dog started chewing on the tube. I tried to prise its mouth open to stop it chewing on it. In retrospect, I was stupid thinking I would be stronger than the dog's mouth. I got my finger caught at the back by its molars. It chomped it a couple of times and bled a lot initially. I just grabbed a Bandaid and put on it.*

Two veterinarians, Chris and Jarrad, received severed arteries from dog bites.

6. Chris remembered how he was bitten by a German Shepherd, which tore his radial artery:

*I had finished examining him and the dog was sitting on the floor with his owner beside him and I was squatting behind him and just about to stand up. ... He had given me no indication that he was cranky, in fact the opposite... He seemed like a really nice dog. I saw him look around but there was no snarling or growling, absolutely no warning. The next thing I knew there was blood flowing out of my wrist. I put my finger on the artery and stopped it straight away and the nurse put a pressure bandage on it, they called an ambulance.*

7. Jarrad on the other hand went to the aid of his veterinary nurse who had been attacked by an Akita (Japanese Fighting Dog), one of two that had been brought in for euthanasia because they had attacked the owner of a boarding kennel. Jarrad reported:

*They left the dogs with us without telling us what really had happened. We euthanased one of them, the female (dog) without incident. ...our receptionist was just walking the other out the back when it suddenly grabbed her. I was outside and came racing in when I heard her screams. There were just three of us in the clinic at the time, the receptionist, this other vet and me. The dog had her on the ground mauling her chest, savaging her. I yelled at the other vet to call 000 which was a good move. I also asked her to get some of the horse sedative Dormacatin; it is very powerful and is given subcutaneously which we did while she (the nurse) was still on the ground. I managed to get it in into the dog and after what seemed like three or four minutes, it let her go and grabbed hold of my arm and hit an artery. I could see the blood hitting the roof. I thought I was a goner. I suppose the dog was attacking me for a couple of minutes before the sedative started to work. When the dog had grabbed me I had told her (the nurse) to get up and get out however she didn't go far. She fell over. She was in shock and there was blood everywhere.*

Both Jarrad and his nurse had life threatening injuries and were taken to hospital by ambulance for emergency treatment.

8. Another subject, Dennis received two severe injuries from dogs, one of which nearly severed his left eyelid and the other a nasty bite to the face. Both injuries occurred late afternoon and evening. In the first injury, he was in a hurry and tried to manage without the nurse restraining the dog. He allowed the owners to hold their dog which he acknowledges was a big mistake. The second bite he attributes to being very tired after having undertaken several calvings, probably stressed and definitely not paying enough attention to the demeanour of the bitch with a litter of pups with her. He said that he had another

case to see after that and did not seek medical attention until well after midnight. As he recalled:

*It was a bitch with puppies and it was about 11.30 at night. I was very tired because I had done some calvings and a few other bits and pieces. I was just not paying attention. I can't even remember what the problem was with the dog. She had puppies in the box with her. I leaned forward and must have got very close to the pups and she just latched onto the side of my face. It was my fault, it was just sheer carelessness on my part.*

9. Danielle, who was previously described above after being bitten because of not anaesthetising a dog, also remembered being bitten by a cat one very busy night at the practice. In a rush, she just applied an Elastoplast on the wound without washing or treating it to enable her to continue consulting. Twenty-four hours later she realised she had a severe infection in her hand and had to seek immediate medical treatment for the wound.

Occasionally even attending to a wound immediately may not be enough to prevent infection.

10. Jennifer received a bite to her thumb from a cat and although she treated the wound immediately, she developed an unusual zoonotic infection, Sporotrichosis which caused her much anxiety. As she remembered:

*I got bitten in the fleshy part of my thumb. He sunk his teeth in. I have never been bitten before or since. I was probably being slack and holding him myself and I was just giving it a vaccination and I was holding him by the scruff myself which I still do. He just swung around and got me. I washed it out and put Betadine on. By that night it was really swollen so I went to the doctor next day... The thumb blew up fairly smartly but didn't heal. The doctor gave me several doses of antibiotics and this went on for a while. Eventually I swabbed it myself and sent the swab off to the vet path lab and they told me it looked really weird and sent it to a human lab that finally diagnosed Sporotrichosis. I had to go on potassium chloride orally for three weeks which was absolutely disgusting stuff.*

11. Karen had recently received scratches and a severe bite from an old cat, which has seriously eroded her confidence in handling cats. She has become very stressed because of this and no longer felt that she could manage to treat the cat.



Subjects indicated they had many near misses from dog and cat bites and James' experiences are quite pertinent.

12. James estimated that for every ten attempted bites from dogs, about one would connect, but generally not cause much damage. He blamed the owners stating:

*Over the years, I think the proportion of people that have chosen difficult or inappropriate dogs has increased and also their inability to manage or control the dogs is a problem.*

Questions were sought to establish the extent of back and neck injuries that occurred in small animal practice. These were asked in the social context in which they occurred.

Jane can only work part-time in small animal practice, because she sustained an injury to her neck that has altered her life.

13. Jane and the veterinary nurse were carrying a very heavy dog into the kennel after surgery when it slipped. It was her desire to protect the nurse from injury that led her to bear the full weight of it, thereby receiving a severe neck injury. Her neck started to improve with exercise and rehabilitation. She recalled her experience on a Friday afternoon:

*I was hurrying because there were lots of things I needed to do at home. It got to about half past 3 and I was spaying this enormous 50 kilogram Rottweiler, a really difficult spay in season - you know the usual big fat horrible thing. I had got through the surgery alright and I was in a hurry to get home and I was using one of those stretchers with the poles down the side with the nurse. We lifted it down from the table and as I lifted it off I took all its weight through my right shoulder and neck. I felt the pain immediately and thought "Oh my God" but just kept going with it anyway because I just had to get it into the cage and then go home. I put the dog in (the cage) and thought everything would be fine. I went home and thought "God my neck is sore." I took some Panadeine Forte and thought it would be fine by Monday. This was Friday. I got to work on the Monday and was having a terrible time of it with sore neck and headaches. I went home that day and went to the doctor because it was getting worse rather than better, I was then put in hospital because I was having awful trouble even standing up. The headaches were so bad and migrainy, I felt faint all the time. It was really bad. I should be able to remember better than that shouldn't I? Except I do remember having two weeks in hospital because the doctors said I had to lie flat and have Panadeine Forte and valium.*

She thought she had improved a little and was working part-time however a second episode occurred where she exacerbated the condition, which incapacitated her for a long time. The pain experienced has had a major impact not only on her working life but on her social and family life. She is unlikely to ever be able to work full-time because almost all activities require her to bend and use her neck. What is particularly hurtful for Jane is the notion that her colleagues believe she is exaggerating her problems. This is currently a major source of stress as she feels guilty about not appearing to pull her weight. Although x-rays indicate she has a chronic injury, her injury is invisible to outsiders, even educated professionals like her colleagues.

The worst injuries sustained by subjects, occurred as a result of interactions with large animals such as cattle and horses and to a lesser extent, sheep and other species.

#### **4.3.3 Injuries from large animals**

According to the responses of this study sample, but also supported by many other studies, injuries from large animals were generally much more severe than those from small animals. During the in-depth interviews, most subjects involved with large animals recalled having had a minimum of three major injuries with the exception of Robert who had received 18 major injuries from large animals. It is interesting to note that the subjects did not generally take time off work for their injuries.

The most frequent injuries reported by the 37 veterinarians who worked with large animals, mainly cattle and horses are summarised in Table 4-7. Of the subjects who worked with large animals, 38% of these received bruising, which was severe enough to limit their veterinary work. Severe cuts to hands were also frequently sustained (38%), followed by fractured skulls, concussion or being knocked unconscious, broken wrists, hands or fingers, back injuries, and major knee injuries. Other injuries included broken ankles, legs, ribs and dislocated elbows.

While animals were not directly involved in their injuries, four subjects had been injured in serious car or aeroplane accidents on their way to treat animals.

**Table 4-7** Types of injuries incurred by subjects from large animals

Type of injury	Number (n=27)	Working with large animals (%)
Bruising (severe)	14	38
Major cuts from knives & from calving hook	14	38
Unconscious, concussion or fractured skull	10	27
Broken fingers, hand or wrist	8	22
Back injury	8	22
Knee injuries including fractures	8	22
Broken ribs	7	19
Kicked - abdomen or thorax (large animals)	6	16
Sprained wrist or ankle	5	14
Broken ankle or leg (excl knee)	5	14
Dislocated elbows	4	11
Transport accident (car, plane)	4	11
Hit in face or head include broken nose	3	8
Goring	1	3

Some of the more common injuries will be described along with comments from the subjects as to how the injury occurred.

#### **4.3.3.1 Bruising and broken ribs**

Bruising and more serious injuries often occur to veterinarians while working in cattle or horse chutes or races. Forty one percent of large animal veterinarians in this study had been badly bruised or received broken ribs, mostly from working in races, as described in the following accounts.

1. Dennis recalled being badly bruised several times when caught in cattle races while pregnancy testing:

*You get caught in the race and all the cows move forward and you get stuck between them so you remain upright and that usually leaves some black and blue marks. Nothing was ever broken surprisingly.*

2. Jack was badly bruised and also hurt his back severely after being caught in a race with cattle. He attributed his injuries to inadequate facilities and inattention by the elderly farmer in allowing a cow into the race when Jack was already working there:

*I was at a farm run by an elderly man. The cattle yards were barely adequate. These heifers were pretty stirry but everything had been going along ok. The last few in the yard had got really stirred up in the process. The old chap had forgotten to close the gate leading into the race. One of the heifers saw what she thought was an open space and she came up the race, up over the top of both me and the other cow being tested and I was flattened and bruised. I finished the pregnancy testing but had*

*to take the next day off. My back was very sore but I didn't need to see a doctor.*

Seven other subjects caught in races by cattle were not so lucky and sustained severe damage including several with broken ribs. Again, all blamed their injuries on poor facilities and a lack of concentration by the farmers.

3. Tom remembered the experience well when working for a State Department of Agriculture and attributes the broken rib he received when a cow ran backwards over him, to a lack of experience by his assistant:

*We had a young and enthusiastic field tech (technician) at the time and he shut the gate, the head bail, in front of the cow's face when the cow was half way in. He shut it smack right in its face and it moved backwards at high speed hitting me before I could get out of the way. I went to the doctor and he confirmed I had a broken rib, gave me pethidine for 24 hours and then I was back at work.*

4. Delivering calves is also fraught with danger as indicated by Gerard who blamed faulty equipment when he sustained injuries trying to deliver a calf from a cow that he thought had her head restrained in a crush. However the cow's head came out of the crush and the cow backed up pushing him up against the crush wall and crushing his chest resulting in several cracked ribs. He said that he should have checked the equipment himself instead of relying on the farmer to do so. He also indicated that he could prevent a cow from backing up by placing a restraining bar behind her however he prefers not to do this because of the possibility of the cow collapsing onto his arm causing hyper-extension of his elbow. This latter injury is relatively common and sustained by four of the subjects and will be described later.
5. Another frightening experience was that recalled by Robert who blamed his injury and the resultant severe bruising, on the bull's untoward reaction to the drug xylazine when he attempted to sedate it:

*I was trimming hooves and this bull was lame and wouldn't move (into the crush). ... I had 2 ml of Rompun in a syringe and I grabbed his tail and jabbed it into his tail vein and he spun around like a rocket and he got me fair in the pelvis. He pushed me back hard against these pipes and I remember sort of screaming and he backed off to have a proper go at me. As he backed off I ran down the race thinking he might follow me. He didn't but I didn't know that... I got to the end of the race and*

*collapsed in a heap and the guys there had to drag me out underneath the rails.*

#### 4.3.3.2 *Cuts and tears from knives and calving hooks*

Cuts, especially to the hands, were another major injury sustained by 48% of subjects. Interestingly, being cut was regarded as part of an everyday risk in veterinary practice and a few of the subjects sutured their own wounds instead of having a medical practitioner do it. They acknowledged that this is often a difficult task if the cut is on the same hand with which they work.

6. As indicated earlier, Robert had received lacerations several times and often sutured these himself. For example, when he sliced flesh out of his left hand leaving a large fleshy groove, he sewed up the wound himself:

*I did three great big sutures and pulled the wound together tight. I didn't think it was worth going to the doctor for. This was on my left hand so I could stitch it myself.*

Two subjects had calving hooks go through their hands; their accounts provide valuable insight as to how these injuries occur.

7. Robert's account of how a blunt calving hook slipped out of the eyes of a dead calf as he was preparing to do a foetotomy is quite graphic. The hook went through his hand with the farmer pulling on the calf while Robert manipulated it. He recalled:

*He (the farmer) was pulling for all he was worth and I think it (the eye hook) pulled out of the eye socket, he had pulled so hard and it caught my hand because I was trying to manipulate around a bit. It caught my hand and it went right through. What I did was I wrapped my hand up and bandaged it a little bit and carried on and did a total foetotomy... I just bandaged my hand. It was bleeding like crazy, because the hook went right through and came out the other side of my hand. When I had finished the job, I went to the hospital and got someone to stitch me up.*

8. Gerard also was trying to break up a dead calf inside a cow using a single embryotomy hook. He recollected:

*I was just trying to break up the calf inside the cow with the hook. It slipped, broke through the bone and entered my hand. I saw a local medico, and it was stitched up and I was given antibiotics. I wasn't disabled at all and kept working... I just wore a glove over the hand to keep it clean.*

It is interesting to note that both these subjects continued to work and finished their task before they sought medical assistance for what must have been extremely painful injuries.

9. Stephen, on the other hand, was forced to seek immediate medical assistance when major blood vessels and nerves were cut while he was showing the farmer how to castrate calves. He recounted:

*The farmer wanted to learn how to do it so I gave him the scalpel and as he went to cut the calf, the cow kicked him and he drove his scalpel straight through my left forearm. It severed the radial nerve, all the tendons and all the blood vessels in my arm. It severed everything as neat as you like. I realised straight away what he'd done. My hand went numb immediately. There was blood pissing everywhere. I had severed the main arteries. I grabbed some haemostats and clamped off the arteries and got myself into the hospital.*

Both Stephen's and Robert's injuries were in part due to the inexperience of farmers who were assisting them.

#### 4.3.3.3 *Head injuries and concussion*

Unlike some of the other injuries recounted, the following accounts are probably more serious and even life threatening. Most required urgent medical treatment, hospitalisation and sometimes surgery. Thirty percent of the subjects who worked with large animals, had been knocked unconscious, and had received fractured skulls and/or concussion. Two subjects indicated they had been knocked unconscious twice. Most subjects were treated in hospital for these injuries however, not all subjects sought medical attention despite the seriousness of having been unconscious, albeit, for a brief time.

10. For example, Simon was knocked unconscious twice by horses striking him with their back legs while he was suturing them up. On one occasion, although unconscious for only a short time, he didn't think he had been affected and went back to work in the clinic. At that time, his nursing staff had to prevent him from sending out accounts that in their view, were jumbled and nonsensical. Eventually this realisation prompted him to seek medical attention. He recalls that he continued to undertake veterinary calls but it was ten days before he was able to work effectively on the accounts.

11. According to Gavin, he sustained severe injuries in one accident when he was pushing cows into a race to pregnancy test them. These included a cracked sternum, a torn ligament and chipped knee, an injury to his ankle, concussion and a split lip all as the result of one incident. He acknowledged that he was in a bit of a hurry and a little preoccupied about another case. He recounted how it happened:

*I jumped in the yard to push them up into the race. There was a sorting area before the race that was a bit wider. One of the cows turned around and came at me. Because I was in a hurry, I tried to bluff her. She wasn't in the mood to be bluffed. I remember she had her head down arriving about the level of my midriff and thinking "This is going to hurt" Some time later I heard people saying "It's okay, the ambulance is nearly here". Apparently she had caught me and flipped me down the yard, and then as she tried to get out of the gate she danced all over the top of me. I hurt like heck but what exactly happened to me I don't know. The farmer and his wife had let the cow out of the yard and rolled me into the recovery position. The ambulance took me to hospital and they took x-rays and CT scans and decided that I wasn't too badly injured at the time and they asked my wife to keep an eye on me for head injuries because they didn't have a spare bed.*

12. Another significant account was given by Sam who was kicked under the jaw knocking him unconscious as he was examining a horse without any restraining facilities such as a race or yards. He recalled:

*I was doing a rectal examination in the middle of a paddock with minimal restraint with a twitch and one leg tied up and I copped one under the jaw. I did a large amount of stud work and a lot of rectals (pregnancy testing) without proper facilities. In those days they weren't readily available. I hate to think how many I did without decent facilities. Of course I did one too many and eventually stopped one. The horse kicked with its hind legs and got me under the jaw. The bottom edge of the foot put a mark across my chest. The top edge hit me under the jaw. It knocked me out and I woke up spitting dirt out of my mouth because I had landed face first in the dirt. I was very sore for more than a week. I could hardly move my neck or my arm. It was a bad contusion. Luckily that's all it was... I was in bed for a few days. That's all it was - a bad contusion. I was very lucky, very lucky. And now, this arthritis that I've got, it's not really bad but it does restrict the movement in my neck, particularly with driving. It is a bit of a hazard. I can't turn easily to see what's coming at intersections and things.*

Robert and Dean, in separate incidents received fractured skulls as the result of a calving jack recoiling, a kick from a heifer and from a horse striking.

13. Dean described how he was knocked unconscious:

*I was trying to drench a thoroughbred yearling that was quite difficult to restrain even with a twitch on. It was just so unexpected. It happens all the time in the sense that horses do that. It was a risky procedure and that was the first time I had really been caught. It suddenly reared up and struck me on the side of the head, knocking me unconscious. I was taken away by ambulance to hospital where I was under observation in casualty for about three hours and then I discharged myself. I went back to drench the horse the next day. I was pretty nervous but I needed to "get back on the horse" again. You know if you fall off you have to get back on straight away. I was experienced with horses but if you drench enough horses you will get hurt eventually. Over my life I have drenched about 20000 horses so one or two major injuries in the first ten years is probably acceptable. Well it isn't really acceptable but it is part of the risk of being a horse vet.*

14. Robert who has had the most occupational injuries of all subjects has been knocked unconscious twice. The first time was when he walked to the back of a Hereford cow to pregnancy test her and she "double barrel" kicked him in the head, knocking him unconscious. He only remembered having a severe headache following this and did not seek medical attention. He was able to describe with more detail the second occasion when he was knocked unconscious:

*I was doing a calving about 4 pm and I couldn't get the cow into the crush so I was doing her in a little yard. She was fairly quiet. I remember leaning over to wash my hands in the Betadine scrub one more time and I had the calving jack all set up behind her and that's really the last I remember. The farmer said that she spun around and that the jack collected me just above my temple. I woke up on the ground with the farmer being very concerned. I had a goose egg about half the size of my fist. I finished the job and that night when I developed a pretty horrific headache, I went to the doctor that night. He said an inch higher and it could have killed me. An x-ray showed I had a fractured skull.*

These are just a few examples of subjects receiving potentially life-threatening injuries from large animals. However, the most frequent debilitating injury, which can appear to be acute, but may have progressive onset, is that of back and neck injuries.

#### **4.3.3.4 Acute back and neck injuries**

Most of the subjects indicated they had painful backs, however eight (24%) said that they had sustained severe, acute back and neck injuries. Because of this, some can no longer undertake work with large animals.



15. Tom was examining a horse for lameness when it “spooked” at something on the ground and panicked. The horse jumped forward landing on top of him. Tom knew immediately that he had injured his back quite severely because of the intense pain and half an hour after the injury, he recalls he had pins and needles in his legs. He sought medical attention and was prescribed anti-inflammatory drugs for several weeks. However there was little improvement and it was only when he noticed severe muscle wastage in his left leg that his doctor did further investigation. X-rays revealed that he required surgery for a disc fenestration. The surgeon also found he had fractured the last two lumbar vertebrae that were healing with calluses that were pressing on the spinal cord. He needed a full laminectomy where his damaged vertebrae were fused. He was hospitalised for three weeks in which he had to lie flat on his back with no movement followed by four months off work. Despite this happening 20 years ago, Tom is still limited in his movements and now his job is mainly administrative. As he recalled:

*I am very prone to getting backaches. very prone to getting severe sciatica and pain down the leg. ...I would be pregnancy testing in the morning and it would be exceedingly painful when I came home at night. I couldn't sleep at night because of the pain in my back and legs. I went along to the doctor who referred me to a specialist who diagnosed the condition and put me onto new anti-inflammatories called Celebrex. He told me they were the only ones that would work. I was on them for six months and then I had a stroke. It turns out that Celebrex increases your chances of having a stroke.*

Tom did have a major cerebrovascular accident soon after he was prescribed Celebrex, which added to his incapacitation. Tom is also a smoker and he acknowledges that he can't totally attribute his stroke to taking Celebrex. This drug does increase the chance of strokes<sup>175</sup> and has been recalled in the US with warnings issued in Australia about its use.

16. Another subject Aaron, recalled that he already had a mild back injury from lifting a dog. He exacerbated the problem after undertaking a calving without any assistance. He remembered being in considerable pain for a long time because he was initially misdiagnosed as he was regarded as being too young to have a back problem. As he recalled:

*I kept throwing fifty kilo Rottweillers onto the examination table. Finally I ended up in hospital because I couldn't get out of bed. I was sent to a specialist in Sydney where they diagnosed me correctly. It was definitely a chronic injury. I had been in pain for 18 months being unable to sleep at night and unable to straighten out my legs in bed and that had been happening for a long time. I had been trying to do a calving on my own. We usually have a male veterinary nurse who attends a lot of calvings with us. The farmer wasn't around and the cow was in the yard and I remember it being a real struggle to get the calf out and I don't think that helped my back. That was about a month before I ended up in hospital.*

He has since undergone successful surgery and he is now able to work with large animals.

17. On the other hand, a female subject, Louise, continued to have problems with her back after trying to take a blood sample from a horse that reared up and fell on her. As she stated:

*I received severe bruising to my lumbar muscles on the right hand side. It is amazing what shock and adrenaline can do because I finished collecting my blood sample and climbed out of the cattle yards I was in. It was only after I had taken the blood that I realised I couldn't move any further. I went to the hospital and was in overnight and most of the next day. I wasn't concussed. My muscles were in spasm and I was in so much pain that I just couldn't move. They said there was no permanent damage. I was sent home on pain killers and valium but my back has given me long-term trouble. I think I have probably strained or separated my sacroiliac joint because I get pain in that region quite regularly if I try and lift anything. This happened five years ago and I have continued to have back problems since then. Not constantly but certainly on and off.*

18. Another subject, Sarah, experienced two "blown" intervertebral discs, which she attributed to carelessness on the part of the farmer and the injury was now the bane of her life:

*I was doing a foaling. If you are going to write a text book about blowing a disk then this would be it. I was having a hot shower and it was a really cold winter night when the phone call came in. I jumped straight out of the shower, jumped into my car and went out. The foal was stuck and the mare was thrashing around and the foal was being beaten on things (rocks) and wasn't breathing. We pulled the foal out and the farmer and I went to lift it over the fence to clean out the mucus and to get it to breathe. We were in the process of doing this when the farmer decided it was too much for him and let go. Suddenly I had all the weight on my side and I was going in the wrong direction. I felt something rip in my back and thought I had pulled a muscle. I was still able to walk and talk quite happily until I got home when I put some stuff on it. Next morning when I woke up I couldn't move. It was actually*

*disks blowing. Maybe they came out during the night when I was asleep.*

She sought medical attention and was told it was probably only muscle damage and to rest. No x-rays were taken and she was prescribed pain killers and took a week off work because of the excruciating pain. Despite her being off work, she knows the incident wasn't reported by her employer for workers' compensation purposes. She had unremitting pain in her back that limited her activities. Some months' later when she stepped off a small step at work, she exacerbated the injury. When she attempted to claim workers' compensation she found that she had to use a specific doctor for the claim. This happened to be the doctor who had attended her in the first incident who then refused to acknowledge her injury was occupational. As Sarah recollected:

*I continued to work with constant back pain for about three months however I had to avoid lifting any heavy animals. But I would be bending over a table to vaccinate a dog when there would be this instant pain right through my back and I would have to drop everything. I was walking down a ramp at the back of the Clinic and as I stepped off it I jarred my back and it dropped me straight to the ground. So then I went to the Emergency Department at the Hospital. It was then they x-rayed it and they said "You will need to give it a break and to take more pain killer"... That is when I said I was going to apply for Workers' Compensation because the situation was ridiculous. But Workers Compensation have specified certain doctors to look at Workers Compensation cases and my doctor was one.- the one I had seen originally. They asked her whether the problems I was experiencing now was a result of what happened three months previously and she said "No and you can't enter in any discussion about this.*

The verdict on Sarah's back injury was that she wouldn't be able to again ride a horse again or do much physical activity in the future. Sarah recalled how devastated she was when she knew the full extent of her injury. The thought of not being able to do anything physical upset her. She continued to work with constant back pain for about three months and had to avoid lifting any heavy animals. She ultimately decided to quit working at that veterinary practice but not before developing severe depression because of the constant stress of working with a boss who failed to recognise that she really did have an occupational injury.

19. Like other subjects, David also ruptured a disc while extracting a calf from a cow using a calving jack. He says it was a combination of the enormous pressure being applied and also the cow being at the wrong angle while he was working on it. In David's case, the injury effectively ended his career as a large animal veterinarian. He recalled the situation very clearly:

*I went out to a heifer having difficulty calving tied to a tree and I had the jack on the back end of her and she is running around the tree and this guy was trying to hold onto the rope and I am trying to jack the dead calf out the back of her. The angles at which I was working were all wrong and I put maximum strain on the jack and my back (which) caused me to rupture a disk. I felt it go. It was really very painful at the time. I did get the calf out- I always finish the job (laughing) and then my back was really sore and the next day I was almost paralysed. I lay on the floor for two weeks. I wasn't on work disability because I have a clause in the policy in order to keep the premium down, I always had to cover the first two months. I took a month's holiday in the first month, and the second month, I went back to work in a back brace only doing small animals. I have never done large animals since. I was just fortunate I could move back into small animals after 20 years of large animal practice.*

Fractures and ruptured ligaments will be discussed together since most of these have similar risk factors and result in some form of incapacity.

#### **4.3.3.5 Fractures and ruptured ligaments**

Fractured fingers, hands, arms, ribs ankles, legs and knees were incurred by 36% of subjects. Many of these received more than one fracture over their working life. Fractures were generally a result of horse or cattle kicks to legs or arms, although some occurred as a result of being charged by aggressive animals, jumping down from cattle races or fences. Fractured ribs tended to occur when subjects were caught in cattle races or charged by angry bulls or struck by flighty horses. Probably the worst injuries involved the patella and the ligaments surrounding it and eight subjects (24%) experienced severe knee injuries.

20. Dean's account is typical of the eight subjects. He suffered a ruptured cruciate ligament, collateral ligaments and meniscal damage to his knee when a farmer ran a second cow down a cattle race while he was trying to deliver a calf. This resulted in a total knee reconstruction, which has had a devastating impact on Dean's sporting and recreational activities. He described what happened:

*I was in a race calving a cow and while I was doing the first cow, the farmer found this second cow having a difficult calving. The farmer let the second cow into the race and she charged at me. I didn't realise she was coming and at the last moment tried to move but she just caught my knee – head butting it at a funny angle and totally ruptured my knee. It tore my medial meniscus completely off and ruptured my cruciate ligament and one of my collateral ligaments. I couldn't walk after that. I couldn't do anything after that so I didn't finish up calving the cows. The farmer actually thought I had shot the cow because of the noise as my knee cracked. It was my left knee. I drove back to the veterinary clinic with one leg which was a load of fun...I can't run any more and I can't do any physical or team sports any more. I used to do quite a bit recreationally before the injury. It has led to a fairly dramatic change in my life in terms of my athletic and recreational pursuits. At the time I don't give too much thought to what the farmer himself had done but at the end of it I was quite pissed off with what he had done. Yes, I think this is quite a common accident that occurs with vets.*

Another common injury that affected both male and female subjects involved dislocation of the elbow. Four subjects revealed that they had received this injury while pregnancy testing or calving cows and indicated that it was caused by faulty equipment or yards.

#### 4.3.3.6 *Hyper-extension of the elbow*

Gerard, Louise and Jennifer all hyper-extended their elbows when pregnancy testing while Simon's injury occurred when he was delivering a calf from a cow.

21. Gerard remembered pregnancy-testing dairy cows on a rotary platform and recounted:

*The cow sat down rapidly trapping my arm inside her. There was a rail behind her and my arm got pinned against the rail as the cow kept sitting down causing hyperextension of my elbow joint. The lateral and medial collateral ligaments got stretched and the medial one ruptured. The joint capsule got stretched and the ulnar nerve got crushed.*

22. Jennifer was also pregnancy-testing when a cow collapsed to the sitting position. She recounted:

*I was inside a cow and she jumped up and came down and just bent my arm backwards. It made a horrible noise. I thought I had busted it off. I continued pregnancy testing and finished the job using my left arm with my right elbow wrapped in ice but by the time I got home I realised I couldn't use my right arm at all so went to the doctor, got put on anti-inflammatory drugs and told there was probably nerve damage there and that*

*when the swelling came down, I should go to a physio and see what happened. They didn't x-ray it or anything like that. I was terrified because I couldn't feel anything or do anything with it for about two weeks. I still couldn't reach up and do my hair for about three months but now it is fine.*

23. Dominic experienced hyperextension of the elbow that required reconstruction. He described how most of these injuries occur:

*Hyperextension occurs in two ways. One is just repeated pushing to enter the cow through the rectum, and the other is the angle of entry and also the positioning of the cow. In many cases you are required to pull the cow across with your arm when you are pregnancy testing in a herringbone dairy. I think rotary dairies are better than the herringbone for pregnancy testing in. One problem with rotary dairies occurred with my partner when the cow went down and he hyper-extended his elbow in a huge way when his arm was caught under the bar.*

He says that the surgeon did a great job remodelling his elbow that enabled him to return to pregnancy testing albeit with caution. Sadly however his shoulder developed arthritis from pregnancy testing and he is dealing with chronic pain. This form of injury will be discussed further under the heading, chronic injuries.

24. Simon, on the other hand, experienced hyperextension of his elbow when undertaking a calving. He recalled the cow collapsed to the ground:

*The cow fell down and I didn't get my arm out fast enough. It was my left arm. I couldn't use my arm but I directed the calving. Then I went to the doctor and then was sent to the hospital where the local orthopaedic surgeon put it back in. It happened in the morning and they let me out in the afternoon.*

As documented in the following pages, there were other serious and life-threatening injuries incurred by the subjects.

#### **4.3.3.7 Other severe injuries**

By far the worst injury which was almost fatal, was that experienced by Ian when he was working on a pastoral station at a camp 80 kilometres away from the main station.

25. Ian described how he was gathering blood samples from horses for blood typing for the Stud Book and also doing pregnancy testing on mares. One of the mares he was pregnancy testing was quite skittish

so he tranquillised her with xylazine and had put her into the cattle race, these being the only available facilities. One of the workmen assisting him then slid a bar behind her to prevent her backing out. He recalls having asked one of the workmen to push the bar up against her because she was able to move too much. He went behind her to pregnancy test her. The next thing he remembered was something hitting him in the abdomen and thorax. He still doesn't know if it was the horse that kicked him or if it was the bar that hit him. As he recalled:

*It felt like it was a horse's hoof and I had a scrape mark on my chest. I was knocked down. I got up, climbed out of the yard, I sat down for a bit because I was badly winded. I could feel something warm pumping in my chest and I was getting weaker and I knew something was wrong. I walked back to the camp house and they called the Royal Flying Doctor Service (RFDS). It was about 47°C so they put me in a caravan that had air conditioning and I waited there until the doctor turned up. I didn't know how bad it was. I was walking and talking. I just felt a bit weak and winded. I was a bit pale and the pumping in my chest made me realise something was busted. RFDS took about 8 hours to get there. Actually it couldn't come to where we were so I had to get back into the plane (light aircraft) and fly to where RFDS could land which was at the main homestead about 80 kilometres away. ... They found I had a tear in my liver and mended that as best they could. They were running blood into me and trying to stop the bleeding in the liver. I was told I received 9 litres of blood on that occasion. I was in intensive care for 2 weeks.*

Ian was subsequently sent to a regional hospital where his treatment continued. Unfortunately things went from bad to worse when he developed infections, a lot of adhesions and experienced excruciating pain. He was treated with antibiotics and Panadeine Forte which according to Ian, didn't work. Eventually, in order to relieve the pain, the doctors injected local anaesthetic into his chest, however the pain continued which led to Ian dosing himself with Pethidine. A pain specialist eventually froze the phrenic nerve, which helped alleviate the pain but by then, he was being treated with sustained release morphine to which he became addicted. Two years had elapsed since then and at the time of the interview, he was on antidepressants and felt suicidal. Unfortunately, Ian's story is not an isolated case.

Five other subjects were kicked in the abdomen or thorax, mainly by horses, but also by cattle. They too experienced life-threatening injuries.

26. Robert, for example, was charged by a cow when he was treating her calf, which was scouring. Robert indicated the cow was normally a gentle Piedmontese Friesian cross, but on this occasion, she charged aggressively at him, knocking him to the ground and then knelt on his chest. He recollected:

*She pushed me down and I was on the ground and I had my thumb in her eye and I was bellowing at her to get off me. To begin with, she was just pushing my chest with her horns, into the ground. But then she walked up further on me and she knelt down with her front legs on my chest... then she got up. She figured she'd killed me I think. I couldn't breathe, I couldn't make a noise any more, I let go of her eye. She got up and her calf left and she wandered off with her calf. ...After all this had occurred, I crawled over to a tree and leaned against a tree for a while. My phone had been in the pocket of my trousers and I was going to call my wife to come and help me but the phone wouldn't work because it had been smashed. I did have a beautiful bruise on my leg where the phone was. I crawled into my car and drove home. You know I went to church that morning. ...I was just bruised. I was black and blue all over.*

Again, like many of the other subjects reported, Robert too did not initially seek medical assistance. It was only when he found difficulty in working and because of the pain that he saw a doctor who diagnosed that he had sustained three fractured ribs, a broken collarbone, damage to his lungs and a sprained ankle.

#### **4.3.4 Chronic injuries from repetitive activities**

Chronic injuries such as back, neck, and shoulder injuries, occurred as a result of repetitive actions such as mass vaccinations and pregnancy testing large numbers of cattle. Eight subjects claimed they sustained shoulder or elbow problems as a consequence of pregnancy testing many cows at the one time and two others developed back problems.

1. Dominic, for example, experienced a repetitive strain injury to his elbow from too much pregnancy testing. He used to do up to 10,000 pregnancy tests per year or 800 cows per day during the "pregnancy testing season". He now has arthritis in his shoulder after having



hyper-extended his elbow undertaking pregnancy testing. According to Dominic, he is not sure if it was due to his placing added pressure on his shoulder when trying to protect his elbow. When he returned to pregnancy testing, he found that his shoulder was so sore after testing even a small herd of around 230 cows, that that he could not sleep for about 10 days. He recalls he couldn't raise his arm above his shoulder and required cortisone injections and a lot of physiotherapy with exercise, which enabled his shoulder to gradually improve. Now he is only slightly inconvenienced by it however he no longer pregnancy tests large numbers of cattle. According to Dominic, two of his colleagues have long-term problems resulting from pregnancy testing cattle. They both have nerve tingling down one side of their neck and body that is on the opposite side to the arm they use for pregnancy testing.

2. Craig was employed as an associate veterinarian for 11 years. His duties included pregnancy testing up to 600 cows a day for three months at a time. He described how his back injury occurred. He remembered how his back began to get sore, and how he used to lie on the floor and get ready for the next day of testing until he was forced to see a doctor about his problem. It was then that he was told that *"that's the worst back I've seen on a 35 year old"* and that he had to quit pregnancy testing. All the articular surfaces on the vertebrae were arthritic and his back could not be operated on. However he continued working. Eventually when his doctor found out that he hadn't quit pregnancy testing, he was told he would no longer be eligible for Workers' Compensation because he had ignored his directive. At that stage Craig was forced to inform his boss who eventually placed him on restricted duties and instigated Workers' Compensation. While Workers' Compensation contributed to his base pay, he lost the use of his car and access to after-hours loadings. Tragically at the end of six months he was made redundant because his boss no longer regarded him as being useful to the practice. He has since started his own practice and manages his back problem by exercising, wearing a corset and limiting himself to pregnancy testing less than 100 cows a day.

3. Some subjects did not develop chronic injuries from working with large animals and Jack is such a veterinarian who recounted:

*No I never got chronic injuries from pregnancy testing. In the last 10 years I was doing about 15000 cows per year – the most I have ever done in one day was 800. I finished up with an arm that was swollen up for about 4 days. I normally use my left arm for pregnancy testing and occasionally change arms. I am right handed and keep my good arm for writing with. I wasn't really disabled. I still went to work. I have never had shoulder problems. Given the amount of pregnancy testing I have done, I think I have gotten off pretty well as far as injuries are chronic concerned.*

4. Ryan is another such example and says he can pregnancy test 850 cows a day depending on the facilities. He uses both arms which provides some relief when one arm tires. He acknowledges that currently he has few problems from pregnancy testing however he knows that he won't be able to pregnancy test much longer without causing damage to one or both of his arms. According to Ryan, a colleague, who was around 60 years old and who is a good cattle veterinarian, finally developed arthritis as a result of long-term pregnancy testing.

Not all chronic problems occur as a result of the repetition of pregnancy testing. There are other activities that contribute to these.

5. Another subject, Jennifer, incurred a repetitive strain injury to her fingers and hands and now has permanent arthritis of her wrists and thumbs. This resulted from vaccinating sheep against anthrax. She said she used to use both hands but towards the end of the day, they were very painful so that she would tape them up with Elastoplast to enable her to continue vaccinating.
6. Nick, a government veterinarian, experienced a chronic repetitive strain injury to his wrist, forearms and back from using his computer. It was a newly diagnosed disease at that time and very little was known about it. Consequently there was an element of scepticism as to whether it was a real disease or not. He recalled that he had been given a computer that was going to be used for fieldwork and he was embarrassed by not being able to use it properly. Nick worked on the computer after-hours to develop his skills. He believes now that his posture wasn't very good. He recalled feeling discomfort in both

wrists and forearms but it was not of major concern. With continued use, he noticed tingling in his hands that didn't disappear. Even after he stopped using the computer his arms were still very sore. Ultimately his condition became so severe that he was unable to undertake any activities. Nick recollected how traumatic it was for him and his family because he was in a lot of pain, at a time when he hadn't established his credibility as a researcher, or in the eyes of senior veterinarians in the Department of Agriculture. He recounted:

*I could not even butter or cut a piece of toast, Nor could I wash my hair in the shower. My wife had to do that for a few months. Any little thing would just make it worse. I could not even drive a car. It was all pretty terrible and I don't like to think about it now. I would rather leave it in the past. I had four kids and I wasn't sure I would ever be able to work again so it was pretty worrying because above all, I had no scientific proof. There was plenty of difficulty at home mainly just coping with the situation. My wife was very supportive – fantastic really – so she never doubted me or complained. But I couldn't physically manage the kids, pick them up, wash up or drive the car or help with the washing or anything like that. So for that first year I used to spend a lot of time meditating or just sitting listening to the radio or contemplating.*

He was off work for eighteen months and gradually returned to work, commencing with one day a week and building up to full-time. However he was unable to write reports, use a computer or do post-mortems. Initially, he used a tape recorder with pedals to record weights and information about necropsies for other pathologists. Others would write up notes for him. It took several years before his arms and wrists stopped worrying him and he was able to drive a car, write with a pen and use a keyboard again. He thought that he had recovered however six years after his recovery, he had a relapse which this time affected not only wrists and forearms, but also his neck, shoulders and back. After another prolonged period of recovery, he returned to being very productive. His employer facilitated this with the purchase of a specialised computer dictation system for him. This enabled him to speak slowly into a recorder that converted his words and placed them on the computer screen. He has since written several papers that have been published in refereed journals. Nick attributed his survival to the support of close colleagues especially his boss who

helped him overcome his RSI and gave him emotional support when others doubted that he had a real condition.

Nick said that at times he had despaired of ever getting better.

However he indicated that he always maintained a positive mental attitude, which helped him recover:

*(My boss) was always supportive and said muscles will recover, no problems! It is believing that you will get better. The truth doesn't matter so much. It is your perception that is so critical. I mean if I'd known in 1984 that I was facing months of pain and trauma, I don't think I would have been able to bear it but if you have the perception that you are going to get better soon, and you'll be able to do everything then you take each day as it comes. Yeah perception is everything.*

Other occupational injuries reported which were life threatening included car and aeroplane accidents.

#### **4.3.5 Motor vehicle and aircraft accidents.**

Several subjects indicated that they had been involved in car accidents, which luckily, resulted in relatively minor injuries.

Two subjects indicated that they flew planes in order to cover long distances in minimal time.

1. One subject Mark, almost died when the aircraft in which he was a passenger crashed. He was photographing cattle from the air for his employer. The pilot and another passenger only sustained minor injuries however Mark sustained considerable trauma including three broken bones in his foot, a fractured patella, fractured hip and his right ear was almost severed. He spent a long time recovering from his injuries and was forced to change from undertaking large animal practice to a desk job. He has ongoing treatment and will need another hip replacement. He recalled:

*I am pretty limited by what I can do. I can't do any heavy lifting. I can't run. I can't afford to slip over. If I dislocate the hip it might damage it and will hasten the onset of the next operation. One of the metatarsals in my foot never healed properly so I have a big bony lump on the bottom of my foot and it causes me grief if I stand for any length of time. My hip and my knee both cause me aches and pains and twinges especially if I am sitting at my desk for a long time or if I am driving. I*

*am pretty well excluded from doing any fieldwork that involves more than just poking around.*

#### 4.3.6 Needle-puncture injuries

It is difficult to determine where to place needle-puncture injuries in the list of occupational injuries, since most subjects stabbed themselves several times with needles during the course of their practice and these were mostly innocuous.

The contents of syringes ranged from blood, vaccines, antibiotics, tranquillisers, anaesthetics to peritoneal fluid and abscess contents. Most needle-puncture injuries were inconsequential because the subjects treated the injuries immediately. There were several needle-puncture injuries that had serious consequences because of infection or because of the adjuvant in vaccines.

1. For example, according to Stephen, he developed the zoonotic disease Brucellosis after vaccinating cows with the live vaccine, Strain 19. A description of this is provided under the heading *Zoonoses* later in this chapter.
2. Mark, on the other hand, was vaccinating cattle for botulism when he accidentally stabbed himself. He is not certain whether he had a reaction to the adjuvant in the vaccine or a dirty needle. As he indicated:

*They were short handed in the team processing the animals. They had to have a number of treatments and I offered to do the botulism vaccination. I slipped and injected the palm of my hand at the base of the thumb. Within 30 minutes I could hardly move my hand, I couldn't clench my hand and I was in severe pain. I could feel the pain and swelling starting to travel up my arm. It was a really dirty needle. I was in a pretty bad way. After an hour or two we flew back to the town and I drove myself straight to the local hospital and they put me onto antibiotics and I was right the next day but I was really concerned because it was very painful and extremely fast spreading. I think it was a really dirty needle. I think there might have been a component of allergic response but it was extremely hot and painful and it resolved itself after treatment with the antibiotics. It may have been coincidental but it seems as though the antibiotics made it settle down. I was sore for a week after that.*

#### 4.3.7 Injuries in general

The accounts gathered provide an insight into how some of these injuries occurred and will provide valuable data to aid in the prevention of many injuries that occur on a regular basis during everyday practice. Not all injuries were reported to insurance companies for disability or workers' compensation purposes, which suggests that even if insurance records were available, these would not accurately reflect the extent of injuries and disease.

The researcher documented accounts of risk factors for many of these injuries, having extrapolated the relevant data from the lengthy in-depth interview sessions.

1. Tom for example, stated that veterinarians are *stupid because they think they are indestructible*. He acknowledged that he placed himself at risk many times:

*I probably did it every day. Every day until eventually you lose sight of the real danger. You don't say "hey this is dangerous" until you see somebody else do it and then you wonder what were you doing?*

2. Stephen on the other hand remembered that when he started out as a veterinarian very few of the farmers had proper cattle yards:

*I would say that 70% of all the calvings we did, and we were doing up to 15 or 20 calvings a day, were lasso in the paddock and tie to the bull bar. I would have probably done a caesarean every day with a wild horned cow tied to a bull bar. They move sideways and backwards. In those days it was what you did and if you wouldn't do them you were a pussy. These days I would never expect the people I had working for me to do the sort of things that we did. In those days, it was part of the job.*

3. A similar viewpoint was held by Ryan. He was prepared to work with a lack of facilities, however he acknowledged that new graduates shouldn't have to put up with such precarious conditions:

*I sometimes think that we could do something about their premises. You often see the farms that have poor facilities and they are completely disorganised in a lot of their aspects of their farming life and you wonder how capable they are of improving that. I often see circumstances that are fine for me because I am pretty experienced and I can sidestep difficulties because I am alert to them. But I do often work in facilities that I think, My God, this is not good for my young vets. They are just not aware, alert to the dangers. It took one of my young vets getting injured when I was teaching them, that really made me*

*understand how unaware they are and how much more careful I have to be. It was a young female vet and it was her first week on the job and she was pregnancy testing with no kick gate and I never use the kick gate on these particular facilities. The race has a very good head bale on it but occasionally a cow does pull back but I am ready for it and I just pull my arm out and step to the side. She didn't and got crushed behind it.*

4. It was suggested to Robert who had sustained 18 major injuries in his career, that he might be reckless or injury prone. He did not think so. As he indicated:

*Some people are very careful and move in a measured or deliberate way. I am not like that. I work rings around most people and generally push equipment and machinery fairly hard too. I wonder if charging by the hour makes me try to accomplish as much as is possible. I do think that working in cattle yards teaches one to move quickly at times. One waits until the exact moment and then pounces, when working cattle. It seems that I do get hurt most days. Today I thumped my head on a low gate in a dairy. The owner hits his head on it all the time! Most wounds are minor...just bumps and cuts. But every now and again an injury turns out to be quite serious. The problem I have is that I hardly ever know how seriously I am hurt until the pain persists. If I took the rest of the day off after every little bump and bruise I would most likely go broke! So I just ignore pain and it generally goes away.*

The previous section has depicted the major injuries sustained by the subjects and how some of these injuries have occurred. In view of these injuries, many of which were life threatening, especially for those working with large animals, one cannot help but equate this to a battlefield where mainly young professionals are faced with huge uncertainties as to whether they will be injured each time they attend an animal. What is a critical and concerning issue raised by almost all subjects, is that they accept these injuries as part and parcel of their profession. This attitude has considerable implications for young people considering becoming veterinarians and the veterinary profession will need to initiate changes that will decrease the rate of injuries and alter this attitude.

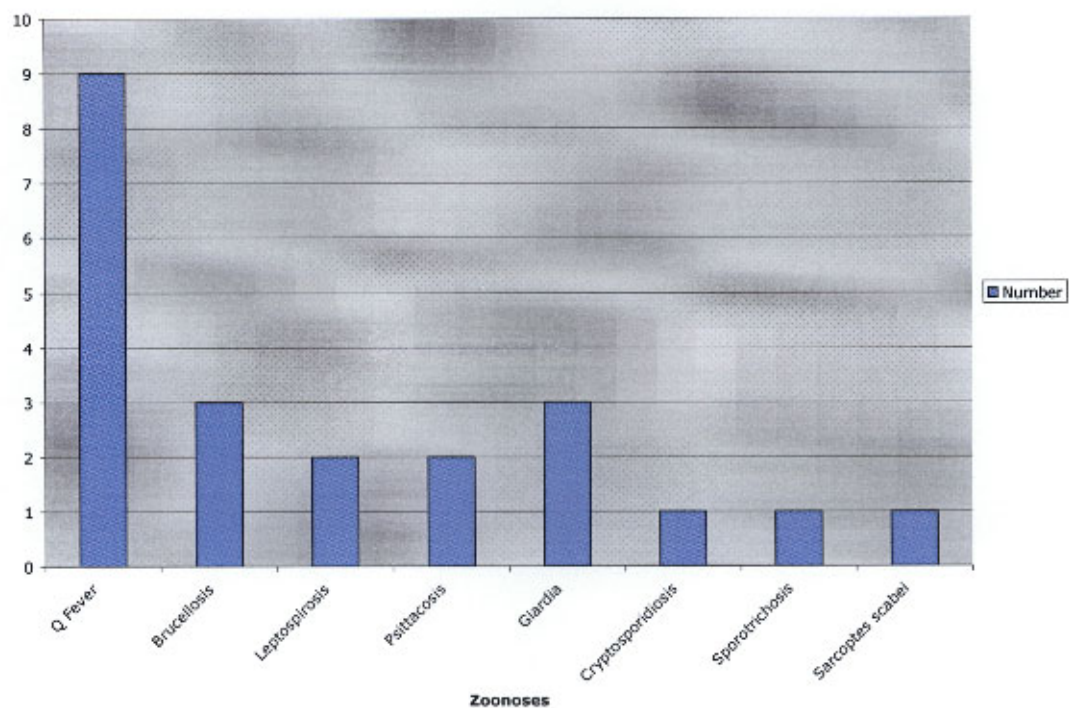
#### 4.4 ZONOSSES

Zoonoses are major occupational hazards for veterinarians especially those working with large animals. Forty percent of the subjects had sustained a zoonotic infection over their working lifetime (Figure 4-2).

Q fever was the most common zoonosis sustained by subjects, followed by brucellosis, leptospirosis, giardiasis and psittacosis. Other zoonotic diseases were scabies from dogs and sporotrichosis from a cat bite. Interestingly, ringworm was not mentioned by any of the 45 subjects.

Some subjects sustained mild infections while others were very ill and one almost died. The major zoonoses sustained by the subjects and the effects of these zoonoses on individual subjects are described in the following section.

**Figure 4-2** Zoonoses incurred by subjects



#### 4.4.1 Q fever

The signs seen for Q fever varied widely with some subjects experiencing few symptoms of the disease, some becoming quite ill, and two being seriously ill.

1. Simon vividly recalled the animal that gave him Q fever. He had undertaken a calving and five days later developed a fever, sweats and fatigue. After confirmation with laboratory tests, he was treated with tetracyclines and was better in a few days. Luckily he did not experience any post Q syndrome with joint problems or chronic fatigue.



2. Another subject, Stephen, recalled how he developed Q fever. He described how he had carried out a caesarean and when the calf wasn't breathing, he gave it mouth-to-mouth resuscitation to revive it. Three days later he was running a raging fever with a temperature close to 41°C. He was taken to hospital. His condition was undiagnosed until blood tests confirmed Q fever. He was then treated with tetracyclines and recovered. As in Simon's case, there were no after effects. Stephen recalled:

*I did a caesarean on a Simmental cow that had just come down from Queensland, an embryo transfer cow. The calf was born "dead" and I gave it mouth-to-mouth resuscitation, and got it going (breathing). In those days we used to do a lot of mouth-to-mouth resuscitation to revive calves.*

Stephen had no doubt that it was the value of the calf born as a result of embryo-transfer that provided him with the incentive to undertake mouth to mouth resuscitation despite the possible danger of contracting a zoonosis.

3. Dennis was another subject who developed what he initially thought was influenza. It was only after he became very fatigued and unable to work, that he sought medical attention. The doctor also suggested it was influenza. According to Dennis, after he failed to improve, he was tested for the zoonoses, brucellosis and leptospirosis but not for Q fever. Tests were inconclusive for the former diseases however biochemical tests for enzyme levels indicated he had considerable liver damage. He described how he progressively became worse and was hospitalised. His skin had become a chocolate brown colour from jaundice. Unable to determine what was wrong with him, the GP had an ambulance take him to a major hospital where the specialist diagnosed Hepatitis C. Interestingly enough, as soon as he learned that Dennis was a veterinarian, the specialist immediately diagnosed Q fever. Further laboratory tests confirmed this and he was then treated with Doxycycline and intravenous fluids. Unlike the previous three subjects, Dennis has also experienced post Q problems. He recollected:

*About three weeks later I developed an orchitis and it was extraordinarily painful. I knew I had a heart valve problem from when I was in hospital. I already had a bit of a heart murmur for as long as I can remember. The doctor was pretty*

*sure I also had a touch of endocarditis. I had a follow-up (after) 3 months ... and they said it was all under control with only an insignificant amount of damage to the heart valve.*

It took another three months before he recovered and was able to return to full-time work. His greatest problem at the time was finding a locum to maintain his veterinary practice. He recalled how grateful he was when a veterinary colleague from a veterinary practice more than 100 kilometres away, came to Dennis's assistance while he was incapacitated.

#### **4.4.2            Brucellosis**

Brucellosis was once a common zoonosis, however it is rarely seen today because of a major federal government program undertaken in the 1970s and 1980s to eradicate the disease from cattle. Despite this, some of the subjects developed the disease in the course of their work.

1. Tom recalled how he got brucellosis when working as a veterinarian in a dairy practice. He said that in the early days, veterinarians just used their bare arms when removing retained placentas from cows that had had difficult births. They didn't wear rubber gloves partly because they thought it was "macho" and partly because it reduced their ability to sense what they were doing with their fingers. On that occasion, he recalled, he knew the herd had abortion problems due to brucellosis but didn't think that he would be at risk. When he got influenza it didn't occur to him that it might have been a zoonosis. When the headaches and aches and pains in his body continued, it was his boss who diagnosed his "flu" as brucellosis. The doctor prescribed antibiotics and he appeared to recover. Over the next few years, however, he continued to have recurring bouts of brucellosis that caused him to be fatigued and have aches all through his body. He recalls he was also "cranky and irritable" which contributed to interpersonal relationship difficulties. He finally recovered from the disease.
2. Sam developed brucellosis by vaccinating himself with the live vaccine, Strain 19, not long after he graduated. Strain 19 was being

used at the time to control the disease in cattle. He recalled how ill he felt:

*In the first week I thought I was going to die and the second week I was afraid I wasn't going to die. It was a fluctuating temperature; high and then subnormal. The subnormal was the worst feeling. I really wanted to die when it was subnormal. I just felt totally depressed. It was just a terrible feeling. ... I wouldn't have cared if I'd died. That's how I felt at the time.*

He reacted adversely to antibiotic treatment and developed an ulcerated tongue from which the epithelium peeled off which was very painful and unpleasant.

3. Another subject, Stephen, also developed brucellosis from stabbing himself with a needle while vaccinating cattle with Strain 19. He recalled:

*We were doing a lot of Strain 19 vaccinations at the time and I was working extremely long hours. I used to leave home at 5 in the morning and come home at 10 or 11 at night 6 and 7 days a week, pregnancy testing 1000 cows. I was working well over 100 hours a week. ... I noticed I was getting tired and tired and I went to the doctor a couple of times and was told I was just overworked. I was absolutely run into the ground. I got to the point where I couldn't continue. For the first time in my life I was experiencing mental depression. I was almost at the stage where it would have been easier to go and shoot myself. I told a (veterinarian colleague about my problems and he told me that a major cause of depression in farmers was brucellosis. I took a blood sample myself, had it analysed (for brucellosis) and it was an extremely high titre. ... I went to the doctor they took some more blood and this confirmed it. I ended up in hospital for about four days on a drip and was put onto antibiotics.*

He was prescribed Doxycycline, which caused severe photosensitisation when he was exposed to sunlight and he also suffered with diarrhoea. Like Sam, Stephen provides another example of a subject allergic to antibiotic treatment.

#### 4.4.3 Leptospirosis

Leptospirosis, which is mainly found in cattle and pigs, is commonly seen in dairy farmers and veterinarians working with dairy cattle. It can be a severe disease depending how quickly it is diagnosed and treated.

Leptospirosis initially causes disease signs and symptoms similar to influenza. Three subjects indicated they had developed leptospirosis and all were severely affected.

1. Robert described the difficulties he had in persuading his doctor that he had leptospirosis:

*I had a headache that wouldn't go away. Muscle stiffness over the back and shoulders. I would take three or four Panadol and the headache would lessen for a couple of hours and then it would be back. By the time I'd put up with that for 12 hours, I decided I had "Lepto" So I went to the doctor and he said "Don't be silly. That's the flu". I made him take a blood sample which he did. Ten days later he got back to me and said "You've got Lepto"*

Robert treated himself with the antibiotic Amoxycillin and by the time he was finally diagnosed as having leptospirosis, he was cured. He did not take time off work despite having been quite ill.

2. Gerard also thought he had the "flu" however he also experienced photophobia as well as sore muscles and had to have time off work. By the time he was diagnosed with leptospirosis, he was better without the use of antibiotics:

*I felt like I had the flu and kept on working. It kept getting worse and worse and the harder I worked the worse I felt I was feverish and had sore muscles and I ended up having a fortnight off work. It wasn't until after I had recovered that it showed up as having being "Lepto".*

3. Another subject, Paul, attributed his developing an unusual form of leptospirosis to working with wildlife in a remote area of Northern Australia. He recollected:

*I used to have these amazing little episodes and every four or five weeks I used to start sweating and trembling. If something happens to you regularly, you accept that as normal. One of my friends who was doing medicine, said I had something wrong with me. They blood tested me and came up with the diagnosis of "lepto". It was easily treated. I probably picked it up in Northern Queensland when I was trapping (wildlife) up there. They told me that it had been found in cane workers of Italian origin so they think it came from Southern Italy. It wasn't debilitating. No not at all. I don't recall it affecting my studies but I guess when I was sweating and trembling I didn't do much either. I can't really remember but I don't think I was affected.*

#### 4.4.4 Psittacosis

Psittacosis is also a debilitating zoonosis contracted from birds and is more likely to be seen in small animal practitioners who work with birds such as Chris and Gavin.

1. Chris recalled that one day he was unable to get out of bed because of a splitting headache and vomiting. His wife called his employer to inform him that Chris was ill. After describing his clinical signs and symptoms, the boss suggested that he might have psittacosis. Chris described what happened:

*I went to the doctor and I was given chest x-rays and blood tests and it confirmed I had psittacosis. I had 60% of my lung knocked out according to the x-rays. I saw a respiratory specialist informally and I didn't need to go into hospital. He said take two weeks off work but I only took 9 days. They gave me Doxycycline for three weeks... I am sure if I had just gone to the doctor, without knowing what I had, he wouldn't have diagnosed psittacosis. I got better with no permanent effects.*

2. Gavin remembered sick birds being brought into the clinic in a box. Without taking the birds out of their box, he diagnosed a respiratory disease and prescribed Doxycycline for treatment. Three weeks later, he thought he had a dose of influenza. When he was still fatigued and short of breath, he sought medical attention. After a series of tests he was diagnosed with psittacosis. He was unable to confirm that this was from the sick parrots because they had escaped. He recalled that he was off work for a couple of months because of the disease.

#### 4.4.5 Other zoonoses

Sporotrichosis incurred by Claire, was most unusual. Her failure to treat the cat bite immediately may have contributed to the development of this disease.

Giardia is a zoonosis that is usually contracted through the consumption of contaminated water or food. Nevertheless, two subjects indicated they had been treated for giardiasis, which they believed they obtained from handling animals.

1. Alan recalled that he had developed sarcoptic mange, which he had received from a scabies infested dog.

When he was a veterinary student, Luke developed Milker's Nodule from examining a cow. While this study was not investigating conditions seen in veterinary students, it was interesting to note that this disease was still occurring.

2. Lynette claimed that the pneumonia she developed after holding a bull's head out of water in a dam for several hours to stop it from drowning should be classified as a zoonosis. Lynette was hospitalised for a week after this incident. While not classified as a zoonosis, she certainly developed an infection in the course of her veterinary work and that is another occupational hazard.

#### 4.5 ALLERGIES

Two respondents had sustained severe reactions to accidental injection of vaccines and four indicated they were allergic to animals including horses and cats.

1. The most severe allergy occurred in Sam after working with horses for many years and primarily affected his hands whenever he touched a horse.

*My hands were affected and my fingers were twice their normal size. They were cracked and bleeding with an itch that would drive you absolutely around the bend. It wasn't very pleasant. If I got horse blood on my hands it was just unbearable... We thought it was one of the drugs we were using and tried cutting various things out of what I was doing. Eventually I went to a dermatologist who determined it was horse protein so I had to quit working with horses....Six months later, I was doing a locum and a trainer rang up and wanted advice as to whether his horse should race. There was no other vet available so I went and looked at this horse. I just palpated her leg because she had a suspensory ligament problem, and said "No she can't race". That night I was at the theatre and halfway through the show, my hands just started to itch, enough to drive me around the bend. I remember going into the bathroom at the theatre and filling up the sink with water as hot as I could get, out of the tap and putting my hands into the hot water to try to get rid of the itch. That's how bad it was.*

As discussed under the heading of injuries, there was general acceptance of increased risk of infection to veterinarians. Risk taking within veterinary practice perpetuates the problem. There needs to be a change in the mindset of older veterinarians particularly, to lower the risk and thereby reduce disease.

During the interviews, 76% of subjects indicated how stressed they were and some had even considered suicide. A summary of the numbers of subjects who indicated they were stressed (perceived stress) is presented in Table 4.2 (p. 89) and Table 4.5 (p.95). Eighty percent of subjects perceived themselves as being overly stressed on a daily basis as a direct result of their professional activities. Several subjects were receiving counselling and were on antidepressants. Some anecdotal information about stress in subjects is presented below.

1. Dennis, indicated that he believed his stress came mainly from a combination of his financial situation and the long hours he was working. This may have also contributed to the severity of the Q Fever he developed. He described his marriage as being "rocky" at the time of his disease and that Q fever may have contributed to the relationship break-up, which occurred not long after he had recovered.

For several subjects, it was the long and unpredictable working hours that affected their emotional health.

2. Dean was one such subject who experienced considerable stress from working long hours. He indicated he had suffered from hypertension for the previous seven years and gastric ulceration for four years. This latter disease is now known to be caused by the bacteria *Helicobacter pylori* and is rarely stress related. He was working up to 80 hours a week and he believed that his working hours certainly contributed to his problems, but it was mainly the after hours work that affected him. He believed that long and unpredictable working hours contributed to his marriage breakdown twelve years ago. He has since reduced his hours by about 30%. He said:

*The main thing that wives and partners don't understand is when you are going to be home. Well, I don't know when I am going to be home. I think that that is the thing they (wives/partners) can't handle the most.*

3. Chris was another subject, who resented the long and unpredictable work hours of being a large animal veterinarian. He coupled this with relatively low rates of return on investment that, as he said, is enough to cause depression. He indicated he was forced to work long hours

just to *keep on the right side of the bottom line* and although he did have the odd day off from work, he would have really liked to be able to have every weekend off.

4. James recalled how stressed he was when he was working more than 75 hours a week in a rural practice and his frustration when he was unable to play sport or socialise because of the likelihood of being called out. He recalled how annoyed he was when, compared to other professional colleagues such as lawyers and dentists, he was earning very little money. According to him he became “extremely stressed” and angry about his situation and even contemplated suicide. He recounted:

*I probably came close at times – on particular occasions but not in a planned way. I guess the classic example is driving back from some call at night and just thinking why don't I just line up that gun tree? More that sort of thing. Tired and peeved and generally pissed off because you're not at that dinner you were invited to.*

5. Robert, the subject who had incurred many injuries, also became severely stressed from what he believed was an unrelenting workload. This may also have contributed to the large number of injuries, which he blamed on taking short cuts. However, it is more than likely that it was the death of his son in a motor vehicle accident that caused both he and his wife to experience severe depression and to both contemplate suicide. Robert and his wife are still being treated for depression even though their son died more than ten years ago. Robert also believed that his stress may have stemmed from trying to please his clients. He said:

*I try very hard to keep my clients happy. I am hurt far worse when a client is unhappy or complains than when I am physically injured. This likely leads into the reasons for my depression. Probably I try so hard to please people that it leaves me with little reserves when something serious happens. Such as the death of our child or my brother.*

6. Gerard indicated that he found being a veterinarian particularly stressful. As he recounted:

*Sometimes I am incredibly stressed. There are different levels of stress. Sometimes it is the stress of having lots of work. The tiredness and the day after day of hard grind gets to you. I have never found that really too onerous. Sometimes there is the*



*stress from the actual nature of the work, particularly when you have bigger issues such as taking on the stress that the farmers are dealing with especially where it is costing them thousands of dollars a day where they have animals dying. Some of it is receiving pressure back from the farmers in actually getting things done. Some of the stress comes from applying effort and time into the workplace when private life also has time and demands as well and trying to get a balance. I don't always get a balance between these two areas. The demands of work often take favour over private life*

*... I know lots of people who haven't coped including me. In the last 18 months since my arm surgery, I have had issues to deal with. I have had to think about my future and self and what extra role I have to play. I don't think I got that far thinking about suicide but I certainly I went through a fairly long period of blackness. I know of quite a number of vets who have been through depression.*

7. The perceived stress of another subject, Nick, came not from long working hours but from having repetitive strain injury at a time when the disease and its causes were unrecognised. Being an invisible injury and feeling the resentment of some of his colleagues, he experienced considerable stress. He acknowledged that he survived only through the support from family and individual work colleagues. He recounted:

*Bear in mind that this was the 80s and 90s. I'd like to think they would be as kind today but the culture has changed a lot. I think in the Government generally, there is a very high consciousness on safety and prevention and if someone were injured you would be supported. But I wouldn't like to have to go through that in today's climate. If you have a broken arm or an arm in a sling or your hair falls out with cancer treatment, it is something physical for people to see, but with RSI, you can't see anything. You just can't do many things and people think that you are lazy or you are not pulling your weight. Later on as you do recover, there are some things you can do and other things you can't. People say you can do some things, why not others. I was very lucky that being a professional, my credibility was established fairly early on.*

8. Ian's stress was probably a result of a physical injury that nearly killed him. Following the kick from a horse to his midriff several years ago, which was described in 4.3.3.7, he experienced many health problems and, because of excruciating pain, he was treated with morphine. When controlled doses of morphine failed to relieve his pain, he started treating himself with pethidine. He ultimately became

addicted to morphine and his mental condition deteriorated. He recounted:

*I am running on anti-depressants. I get very depressed. I have tried to kill myself twice so far. It is a combination of the pain, drug usage and everything else that has happened to me. There were a couple of things at work. One bloke is suing me because one of my staff accidentally killed his dog that came in to be castrated.*

For Ian, his veterinary career was his whole life and not being able to work because of his physical and mental disability affected him greatly. He indicated:

*The difficult part about it is when I look back after all the years of my work as a vet, I have nothing. If I stop working as a vet I won't be able to live... I am ashamed of a lot of what has happened especially with treating myself with drugs but that is how it is. It should never have happened. But it did!*

Ian acknowledged that part of his problem was that he was very independent and refused to ask for help. At the time of the interview, he was still on morphine and the antidepressants were making him fall asleep. He really hated this because he did not feel in control of his life. He and his wife had two children and he was concerned about them. He indicated that if he had taken a break from work straight after the injury and stopped long enough to assess what he was going to do, he might have been better off. Up until recently he insisted on continuing to work because he claimed he couldn't get the professional support from associates. However he finally realised that his only chance of improvement was to quit work and reassess his life. He had associates relieve him completely of undertaking any veterinary work and this meant that he could take time off work in order to recover both physically and emotionally.

9. Louise was another subject who worked long hours as an associate in a mixed practice in a small country town. She recalled that she had no respite from having to undertake out of hours calls. It was the business side of the practice that affected her most and she was unable to leave her problems at work. She recounted:

*When I am stressed, I come home and take it out on my husband.*

She said she did try to resign at one point but was talked out of it. She said that stress was getting on top of her because the practice wasn't doing very well and she perceived it was because she wasn't doing her job properly. She has since changed her view about this and stated:

*I felt that I was to blame. Probably a large part of my not being stressed now is my realisation that there is only so much you can do and after that it is in the lap of the gods to a certain extent.*

Some of the subjects said that they found veterinary practice very stressful when they first graduated because of expectations about how they would perform. They felt that what they had been taught in veterinary school, didn't relate much to what they saw in veterinary practice. They stated that their bosses had unrealistic expectations in that as soon as they graduated they expected they would have the same practical skills as someone who had been graduated ten years.

10. Jessica was an example of this. She was a young veterinarian who for the previous two years had been employed in an inner suburban practice. She found being a new graduate was very stressful. She recalled that when she first started she was often mistaken for the nurse or for the "kid there for work experience". She didn't feel very confident and that in itself, was very stressful. According to her, she had a couple of big cases where clients complained about her. Without the support of her boss who was bemused, she felt alone and very stressed. On a couple of occasions when she desperately wanted some support, this wasn't forthcoming and Jessica indicated that she had to cope on her own. She considered she was the most stressed of all the four vets in the practice and believed that with support from senior veterinarians, stress would not have occurred. She said that some people needed more support than others and that senior veterinarians should understand this. She believed that the females in the practice were more emotionally vulnerable than the males and definitely had less confidence than their male counterparts.

Above all, she didn't believe the veterinary course had taught her how to cope with running a private practice. She believed that when she first graduated, she lacked the practical skills to deal with all real life

and death situations involving animals. According to her, veterinary school was “all very theoretical”. She said that the only way she could deal with any complaints was by referring them to her employer. However, at the time of the interview, Jessica had reached a point where she felt too stressed by her job and was considering leaving.

11. Stress for another female subject, Sarah, came from having endured a workplace back injury and also her inability to be assertive about demanding from her doctor, that her case be notified to Workers’ Compensation. Sarah’s back injury was previously described in 4.3.3.4. According to Sarah, after being told that she would never again be able to ride a horse or do much physical activity, she was shattered physically and mentally and, coupled with failure by a Workers’ Compensation doctor to recognise her injury as being work related, she became very distressed. It is interesting to note that although she had no social or collegial support, her pets’ dependence on her gave her the strength to recover from a spell of deep depression. As she put it:

*I had had all these plans and suddenly I am being told that I am not going to be able to do physical stuff. I actually went and saw a specialist friend off the record while I was at the hospital for something else because I had wanted a second opinion. He said “I’ll have a quick look at your x-rays as a favour for a mate”. He then said “Oh Shit!, don’t expect to be ever able to ride a horse again or do anything very active ever again. Your back is really quite bad. I hadn’t expected your x-rays to look that horrendous. Definitely lay off doing anything physical and have a good break”. I was on my own, no family or colleague support and no support from Workers Comp. That was when the depression kicked in. I was doped out on codeine most of the time anyway. It was textbook depression, with no desire to do anything. I am sitting there thinking my whole life revolves around doing physical things. I think it was the fact that I had to feed my horses and my dog morning and night that kept me going I think. They had to be fed and no one else was going to do it.*

She indicated she did contemplate suicide but was able to rationalise that it was not the answer. Being in constant pain from her back injury, rejected for Workers Compensation, receiving minimal pay, despite doing more than her fair share of the work, working very long hours, and with no support from her bosses, she ultimately quit. She moved to a new location and set up her own practice where she now works on her own.

In hindsight, Sarah questioned why the doctors didn't x-ray her back in the first place and she asks herself why she didn't demand x-rays be taken. She justified the failure to do so because she was in a lot of pain, and not thinking rationally at the time because of the high doses of analgesics she was taking. She also thought she was naive to believe that new graduates should work hard and not complain to their bosses about their problems.

Successive injuries, some of which prevented or impaired essential veterinary practices, seemed to have contributed to a general sense of uncertainty felt by subjects about their earning capacity, their professional performance and their ability to pull their weight within a practice, leading the subjects to what is best described as "emotional vulnerability". Both the verbal and non-verbal communications were also indicative of a more general pervasive emotional vulnerability among the subjects.

#### 4.7 SUICIDE

Twenty seven percent of subjects commented that at times they had had suicidal thoughts. Two subjects said that they were receiving treatment for depression and had tried to commit suicide on at least two occasions as a result of workplace injuries. No attempt was made to quantify the number of persons who had occasional suicide thoughts and those who had seriously considered committing suicide and those who had actually attempted suicide.

Seventy percent of subjects reported a perceived high level of stress in their jobs (Table 4-2) and many subjects believed that this could contribute to a perceived high suicide rate in veterinarians. At this stage, there was only anecdotal evidence that veterinarians were more likely to commit suicide than other professionals.

The following is an example of one subject's view on emotional health issues, depression and suicide in the profession:

12. He attributed the stress in practice to feeling powerless in the job, and believed this to more likely occur in younger rather than older veterinarians, who may be an owner or partner in the practice. He indicated:

*I know lots of people who haven't coped including me. In the last 18 months ... I have had issues to deal with. I have had to think about my future and self and what extra role I have to play. I don't think I got that far thinking about suicide but certainly I went through a fairly long period of blackness. I know of quite a number of people who have been through depression. I know of two colleagues, one of whom was a close friend at University who have suicided. They couldn't deal with problems. One was just four months after graduation. He was in a practice where he didn't get any support at all. The other one, a female, had been graduated for over five years and something happened that made a pretty stressful environment and a couple of mistakes were made that were not really that significant. This put enormous pressure on her and she killed herself. She was only 28.*

It was suggested by some subjects that easy access to drugs may be a reason why suicide is higher in veterinarians. Certainly the main method of suicide for WA and Victorian veterinarians is use of drugs.

13. Interviews with the subjects revealed the following comments about ease of committing suicide and method:

*'As a vet it is relatively easy to have access to the drugs, and to a non-violent suicide! It is easier for us than for other professionals. Suicide is definitely out there!'*

*'I guess vets commit suicide because it's easy. That is the big thing. We don't have too many unsuccessful attempts at suicide. When vets do it, they are successful because they know how to do it.'*

*'...you are driving along and you look and think about it but... I think that what vets are aware of is the fact that to top yourself with barbiturates would be a very peaceful end... Most people are scared of violent deaths... that will impose upon the person that finds them... Vets we are so accustomed to putting animals down in a very peaceful way, and many of us see that as one of the most important things we do ...and realise that if we wanted to end it all, we could do it very neatly, very tidily and with no blood, and nothing to unduly upset the person who found us.'*

*'The other vet I was working with in the practice committed suicide which came as a bit of a shock to the set up. We had no idea she was depressed. She took a barbiturate overdose.'*

*'I think for most people if they feel a sense of power or self control or ownership over what they are doing, and they don't feel it is out of their hands then stress can be managed. It is when you feel you've got no power to change things that it is bad. I've been out of control lots of times. I think everyone does. It depends on personality.'*

*'When you look at the statistics on who suicides, men above 25 are very successful at suiciding with whatever means they use. If you look at the suicide statistics across the population, there are far more successful attempts in males than there are in females. Certainly the 25 + males are very successful whether they have access to firearms or rope or cars or drugs. The access to barbiturates is just a vehicle. Dentists don't have the same access to the drugs we do and yet they're just as successful at suiciding as vets. I am trying to remember where I saw it. I saw something on the different professions.'*

This is an interesting comment because there is no evidence that this is the case. In his 2001 review of contemporary literature on stress and suicide in dentists, Alexander found that there was little valid evidence that dentists are more prone to suicide than the general population.<sup>47</sup> Checking with the Australian Dental Association in Western Australia showed that they are unaware of any evidence that dentists have a high suicide rate.<sup>ee</sup>

#### 4.8 SUMMARY

The interviews with subjects produced a wealth of information on demographics of veterinary subjects and shed light why veterinarians incur injuries, zoonoses and stress and some of the risk factors for these. Possible risk factors mentioned by subjects and associated with injury, disease and stress are contained in Tables 4-8 to 4-10.

**Table 4-8 Risk factors for injuries from working with small animals**

Injury	Risk factor
General	Long working hours Expect that they will be injured Stress
Bites & scratches	Misjudge nature of animal, did not muzzle Allow owner to restrain animal, not using trained staff or holding animal oneself when working alone Owners failing to disclose that animal is dangerous Not anaesthetising dog when should Anaesthetic level not enough (dog bite) In a hurry, inattentive, tired, stressed Late afternoon and evening when bitten General lack of confidence when working
Neck & back injuries	Lifting animals that are too heavy No lifting equipment in practice

**Table 4-9 Risk factors for injuries from large animals and zoonoses**

Injury from	Risk factor
General	Type of animal (Mixed animals more than small or large) Expectation will be injured Stress Long and unpredictable working hours Financial- taking short cuts and "making do" with poor facilities Facilities inadequate eg crushes with no escape, head bale in crush faulty and no barrier between vet and animal Farmer runs more animals into crush while vet working Working in paddock and tying animal to tree or car Having previously had an injury Inattention and being in too much of a hurry Pushing to complete tasks especially owners Unpredictability and dangerous animals Equipment failure eg calving jack slipping Restraining bar in dairies wrong height - hyperextension of elbow
Needle-punctures	Hard to prevent. More care when using dangerous drugs
Chronic	Excess pregnancy testing leads to shoulder, elbow, knee injuries
Zoonoses	Oral resuscitation of new born animals especially if expensive Failure to recognise disease and seek medical attention

**Table 4-10 Summary of risk factors for subjects' stress**

Risk factors
Long and unpredictable working hours Thought of as malingerers by colleagues Life events such as death of child, failure of marriage Little social, family life leading to relationship breakdown Marriage breakdown Financial rewards especially compared with other professionals Failure of support from doctors in diagnosis of back problems, RSI Rural vet on own with no respite and no support networks both physical and social Realisation that what taught as UG is not related to what one does in practice Did not learn as UG, how to manage a veterinary practice Abusive and aggrieved clients Lack of employer's support Lack of colleagues' support Lack of family support

Risk factors identified by subjects as contributing to suicide among veterinarians are presented in Table 4.11.



Risk factors identified by subjects as contributing to suicide among veterinarians are presented in Table 4.11.

**Table 4-11 Risk factors as to why veterinarians commit suicide**

Suicide risk factors
Powerlessness in job
Long and unpredictable working hours
Life events such as death of spouse or child
Marriage breakdown
Lack of support of employer, colleagues and family
Easy access to drugs
Seeing animals euthanased in a peaceful way
Personality

Phase 3, a self-reported questionnaire, was developed to determine the extent of injuries and diseases incurred by subjects and to identify risk factors that contributed to these injuries and diseases.

The results of Phase 1 also revealed that 80% of subjects perceived they were stressed, and 30% of these stated they had thought about suicide. These findings, in combination with there being little data available in the literature about stress in veterinarians, led the researcher to include in the Phase 3 survey, a well used objective measure developed to assess levels of psychological distress in veterinarians.

# CHAPTER FIVE

## 5 RESULTS PHASES 2 - 4

The findings of Phase 1 from the in-depth interviews were presented in the previous chapter. The results from Phases 2, 3 and 4 are presented in this chapter. Some discussion of areas of interest will be provided in this chapter. The major areas for discussion, however, will be presented in Chapter Six.

### 5.1 PHASE 2: DATABASE LINKAGE STUDY

In this section, an overview of the results from linking the names of veterinarians registered in Western Australia with four of the Health Department of Western Australia's databases is presented. Data was produced about mental health, cancer, morbidity and death in Western Australian veterinarians.

#### 5.1.1 Mental health

The records for mental health conditions came from two databases: the Mental Health Information System (MHIS) database and from the Hospital Morbidity Data System (HMDS). Overall a total of 1073 records were produced for 50 veterinarians as follows (Table 5-1):

Table 5-1 Summary of Mental Health records from MHIS and HMDS

Gender	% of veterinarians	% of records
Male	48	24
Female	52	76
Total (n)	50	1073

Mental health conditions experienced by 50 veterinarians included schizophrenia, bipolar affective disorder and other psychoses. The number of records for each person is not useful because these indicate episodes or mental health contacts that persons have had with hospitals and outpatient episodes at public hospitals, but not consultations with private psychiatrists. For reasons to be explained later, the data output for mental health conditions are considered to seriously underestimate the extent of mental health conditions in veterinarians.

### 5.1.2 Cancer

There were only records for 48 veterinarians registering 62 occurrences of cancer in the Cancer Registry (Appendix E). There were, however, 139 records for 90 veterinarians in the HMDS but according to the Manager of the Cancer Registry,<sup>ii</sup> the Cancer Registry is more accurate for malignant neoplasms because the HMDS contains records for both benign and malignant neoplasms. Skin cancers, including melanomas formed one third of all cancers and 16% of veterinarians had had leukaemia.

### 5.1.3 Morbidity

Statistics on injuries, disease and other conditions were obtained from the HMDS database, providing a total of 3322 records for 838 veterinarians. When all records for those under 22 years of age were removed, 2649 records for 703 individuals remained. The number of males in this cohort was 363 (52%) and females 340 (48%). From an initial input of 1323 names who had been on the Veterinary Surgeons' Roll since 1994, there remained records for only 703 individuals. Conditions considered to be occupational are summarised in Table 5-2.

**Table 5-2 Occupational disease and injury (HMDS records)**

Potential Occupational Disease or Injury	Vets with condition (n=703)	%
Cancer	90	13
Joint problems other than knee	76	11
Fractures	71	10
Knee problems	53	7
Cellulitis, skin ulcers, skin infections	52	7
Trauma and open wounds	41	6
Collapse, fever, fainting, nose bleeds	38	5
Hernias	38	5
Back problems	36	5
Mental Health	28	4
Infection	28	4
Arthropathies excluding knees	19	3
Neuritis & injuries to nerves including RSI*	15	2
Poisoning including venoms	12	2
Loss of consciousness	8	1
Neurological including migraine	7	1
Zoonoses	7	1

\*RSI Repetitive Strain Injury

The data presented do not indicate the number of times any event occurred, but only the number of veterinarians who incurred that problem.

As can be seen from the data in Table 5-2, there were a number of hernias, knee, joint and back problems, fractures, loss of consciousness, trauma and open wounds, poisoning including venoms, zoonoses, and conditions involving collapse, fever, fainting and nose bleeds. There may be an overlap with categories. For example, some of the arthropathies may involve the knee however there is no way of determining this from the general coding entered into the HMDS. Again, these conditions might well be a serious underestimation of the number of real cases. Nevertheless, some information can be inferred from the data output such as the average age for admission to hospital for the conditions and whether the hospital admissions were rural or city.

The average (mean) admission age for mental health was 42 years, 48 years for cancer, 36 years for neurological conditions, 57 years for heart conditions, 51 years for hernias, 41 years for back problems, 39 years for knee problems, 38 years for fractures and 39 years for loss of consciousness.

A review of postcodes of the 703 veterinarians showed that there were two to three times as many admissions for city hospitals as for rural hospitals for almost all conditions. This is not unexpected since proportionately more veterinarians live in, or close to, Perth. The exception was for unconsciousness, trauma and open wounds, and zoonoses where admissions to rural hospitals were similar to admissions to city hospitals. No conclusions can be drawn about these latter admissions to rural hospitals because the numbers were so low. Most, if not all of these admissions, would be emergency situations occurring mainly in rural veterinarians working with large animals.

The data obtained confirmed the importance of possible occupational injuries, for example, knee injuries and fractures, although as stated in Chapter 3, the statistics derived from this phase are imprecise and can only be considered indicative of the types of injuries recorded and not of any specific rates.

### 5.1.4 Death database

The output provided from linking the names of veterinarians with the Health Department of Western Australia's death records showed just 12 deaths. Two veterinarians had mental health conditions and one had committed suicide. The output was compared with other records obtained in an earlier study<sup>3</sup> from the Coroner's Office in Western Australia and realised the numbers were too few. It was therefore, impossible to come to any conclusion about cause of death of veterinarians from the data-linkage records, especially those due to suicides. The researcher, therefore, applied directly to the Coroner's Office in Victoria and Western Australia, requesting an updated listing of deaths of veterinarians to enable analysis of causes of death (Phase 4).

### 5.1.5 Summary of records obtained by data linkage

A summary of records obtained at each stage within Phase 2 for each database is provided in Table 5-3.

**Table 5-3 Summary of data outputs from Phase 2 stages**

	Database	Total database (n)		Database for >22 years (n)		
		Veterinarians	Records	Veterinarians	Records	
<b>Stage 1</b>	HMDS	838	3324	703	2649	
Morbidity						
<b>Stage 2</b>	Mental Health	MHIS	40	1259	30	988
		HMDS	65	1398	28	116
Total				50*	1073	
<b>Stage 3</b>	Cancer	Cancer Register	48	62	48	62
<b>Stage 4</b>	Death	Death Register	12	12	Incomplete	

\* 8 were common to both databases

As noted in Chapter 3, the data from all four databases was incomplete making any assessment about rates of injuries and diseases occurring in Phase 1 subjects, unreliable and inconclusive.

Records for analysis about the cause of death of veterinarians were obtained directly from the Registrars of Deaths in two states (Phase 4).

## 5.2 PHASE 3 - SELF ADMINISTERED QUESTIONNAIRE

### 5.2.1 Introduction

Stress was raised as of significant concern by the subjects in Phase 1. Questions about stress in veterinarians were therefore included in the self-administered questionnaire, along with other possible risk factors such as job satisfaction and happiness. The questionnaire was sent to 930 veterinarians in Western Australia and to 17 interstate subjects from Phase 1 of the study and resulted in data from 419 respondents (Response rate: 43%).

The results will be presented under the headings:

- Demographic information
- Employment factors
- Occupational injury and disease
- Emotional health aspects of veterinary practice

### 5.2.2 Demographic information

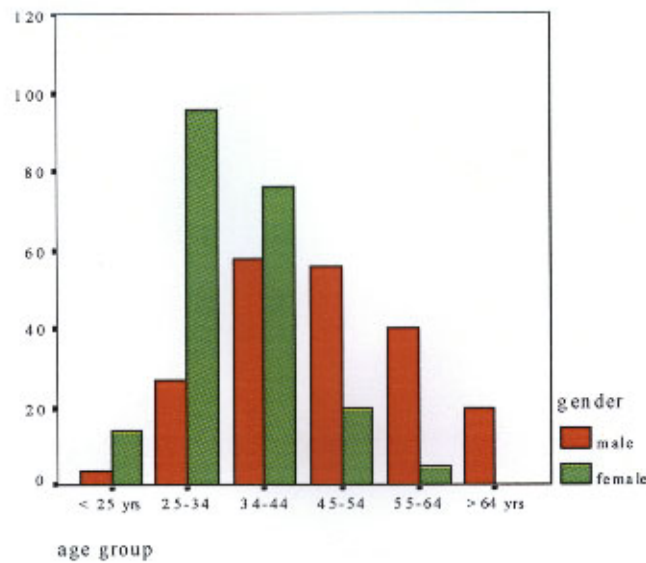
The demographic characteristics of the study sample include age, gender and social marital status.

#### 5.2.2.1 *Age and gender*

There were almost equal numbers of males (49%) and females (51%) but the average age of the males (48 years) was higher than for the females (36 years) (Figure 5-1). The average age of all respondents was 42 years.

Females were heavily represented in the younger age groups while males were over-represented in the older groups. These statistics for age and gender are similar to those found in unpublished data from the 2001 Veterinary Surgeons Board of Western Australia survey of stress (Appendix A).

Figure 5-1 Veterinarians in sample by age groups by gender



The proportion of males and females and their ages are similar to that found by Heath<sup>9</sup> when he examined the number and distribution of Australian veterinarians in 1981, 1991 and 2001 but respondents were slightly older than those in a recent unpublished study by Heath.<sup>iv</sup> This is to be expected because as more veterinarians graduate, the average age of the veterinary population is becoming younger.

Accurate and recent data on age in Western Australian veterinarians is not available for comparative purposes because date of birth is not recorded in the Veterinary Surgeons Roll.

#### 5.2.2.2 Age, gender and if working in Australia

The reasons why 21% of the 419 respondents were not working as veterinarians at the time of the survey are summarised in Table 5-4.

Of the total, 15 (4%), were retired and these people were all male, while a similar percentage of females were involved in home duties. Approximately 6% of respondents were either Australians travelling and working overseas or, foreign veterinarians who had come to Australia to work. Just three veterinarians indicated that they had not worked in the past five years because of ill health through stress or injury.

**Table 5-4 Reasons for not working as veterinarians by gender**

Reasons for not working in past 5 yrs	Male (%)	Female (%)
Retired	30	0
Non veterinary employment	30	27
Home duties	0	43
Working or traveling overseas	30	27
Ill health or stress	4	3
New graduate	6	0
Total (n)	50	37

There was very little difference in data that included those respondents that did not work in Australia as veterinarians in the past 5 years and data that included them.

### 5.2.2.3 *Marital status*

Only 17% of respondents indicated they were not married and, of the 83% who were married, the average length of their relationship was 15 years.

Significantly more males were married than females ( $\chi^2=10.69$ ,  $p<0.05$ ) (Table 5-5).

**Table 5-5 Marital status of respondents by age and gender**

Married		Age groups		
		<35 yrs	35-54 yrs	>54 yrs
Male	Yes	84%	92%	92%
	No	16%	8%	8%
Total (n)		31	113	60
Female	Yes	73%	83%	40%
	No	28%	18%	60%
Total (n)		109	97	5

### 5.2.3 **Employment Factors**

Type of employment, hours worked per week, animal species worked with (case mix) are factors that may impact on injury and disease rates.

#### 5.2.3.1 *Type of employment*

Most respondents were private clinicians followed by government veterinarians and university employed clinicians. The percentages are similar to employment areas for veterinarians currently registered on the Veterinary Surgeons' Register in Western Australia.<sup>hh</sup> The percentages of veterinarians working in the various employment categories are presented in Table 5-6.



**Table 5-6** Type of employment of respondents

Type of employment	n	%
Private clinical practice	343	83
Government/regulatory	35	8
College/uni with clinical practice	23	6
Zoo facility/marine park	1	0
Commercial/industry	5	1
Other	9	2
Total (n)	416	100

### 5.2.3.2 Animal species in case load

All veterinarians, whether employed in government, university, zoological or in private clinical practice were asked to nominate the animal species with which they worked. The data are summarised in Table 5-7.

**Table 5-7** Animal species in case load

Proportion of animals in case mix	Animal species serviced			
	Small animal %	Horses %	Cattle, sheep & pigs %	Other animal spp. %
1-99%	47	89	83	91
100%	53	11	17	9
Total (n)	335	149	161	44

Of the 335 respondents who worked with small animals, 53% worked exclusively with small animals and of the 149 veterinarians that worked with horses, only 11% were exclusively equine. Of 161 veterinarians who indicated they worked with farm animals, 17% worked exclusively with farm animal while only 9% of 44 respondents worked exclusively with other animal species. This category included wildlife, zoo animals and animals like deer, emus and ostriches.

The number and proportion of veterinarians working with small, large, mixed and other animals (case mix) is presented in Table 5-8.

These results indicate that 53% of respondents were small animal practitioners, 15% large animal and 32% mixed animal veterinarians and the remaining 1% involved other animal species. The latter were so few in number that comparisons were made subsequently between the three major groups: small, large and mixed animals (case mix).

**Table 5-8 Percentage of veterinarians working with case mix of animals**

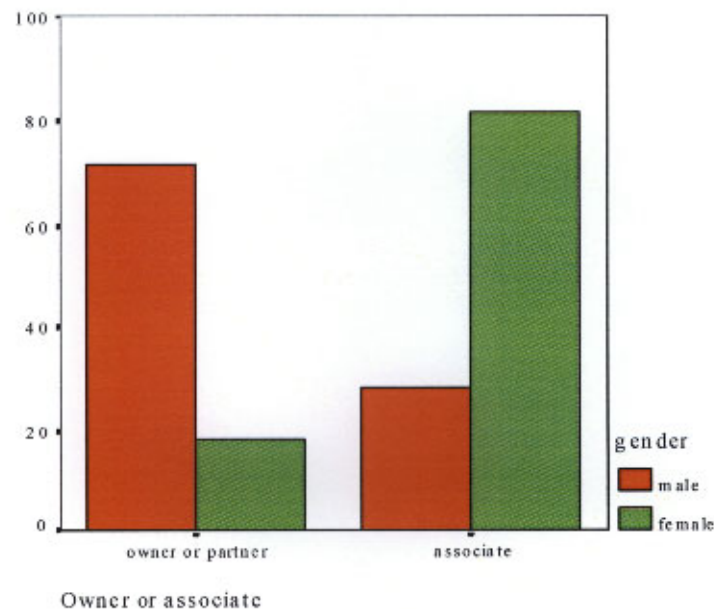
Classification	Respondents	%
Small animal	207	523
Large animal	59	15
Mixed animal	124	32
Other animals	4	1
Total (n)	394	100

5.2.2.3 *Practice ownership*

Respondents were asked whether they owned their own practice or were employed as associates.

The majority (58%, n=190) of the 330 private practitioner respondents were employed as associates and locums with 140 (42%) owning their own practice, either alone (26%, n=87) or in partnership (16%, n=53). Very few female respondents owned practices, most of them were employees (Figure 5-2).

**Figure 5-2 Practice ownership by gender (%)**



Despite there being more females in the cohort, more than 70% of males were owners or partners while only 18% of females owned practices. There was a significant association between practice ownership and gender ( $\chi^2=94.091$ ,  $p<0.001$ ). If one assumes that most veterinarians would not have the finances

to purchase a veterinary practice until about 35 years of age, a comparison of practice ownership between those under and over 35 years and gender was very revealing. More than 84% of males over 35 years owned a practice compared with only 34% of females in the same age group. This association by age was highly significant for males ( $\chi^2=51.440$ ,  $p<0.001$ ,  $R=-0.586$ ,  $p<0.001$ ) and for females ( $\chi^2=24.838$ ,  $p<0.001$ ,  $R=-0.362$ ,  $p<0.001$ ).

If females work fewer hours (see 5.2.3.4) and earn a lower salary, they might not acquire the finances to purchase a practice which might account for there being fewer female owners. There appear to be other factors influencing the lack of ownership of practices by females including a possible lack of confidence in taking managerial responsibility as indicated in a previous study by Heath and Neithe.<sup>65</sup>

The study population was slightly older than that of the general veterinary population in Western Australia, but similar in gender and percentage of small and large animal veterinarians found in other Australian studies<sup>4, 9, 65, 188</sup> including a recent unpublished study by Heath.<sup>9</sup>

#### 5.2.3.4 *Hours worked per week as a veterinarian*

The Mann-Whitney non-parametric unpaired test revealed that there was a significant difference between average hours worked per week for males (49 hours) and females (39 hours) ( $z= -5.434$ ,  $p<0.001$ ) (Table 5-9).

Table 5-9 Average hours worked per week by gender

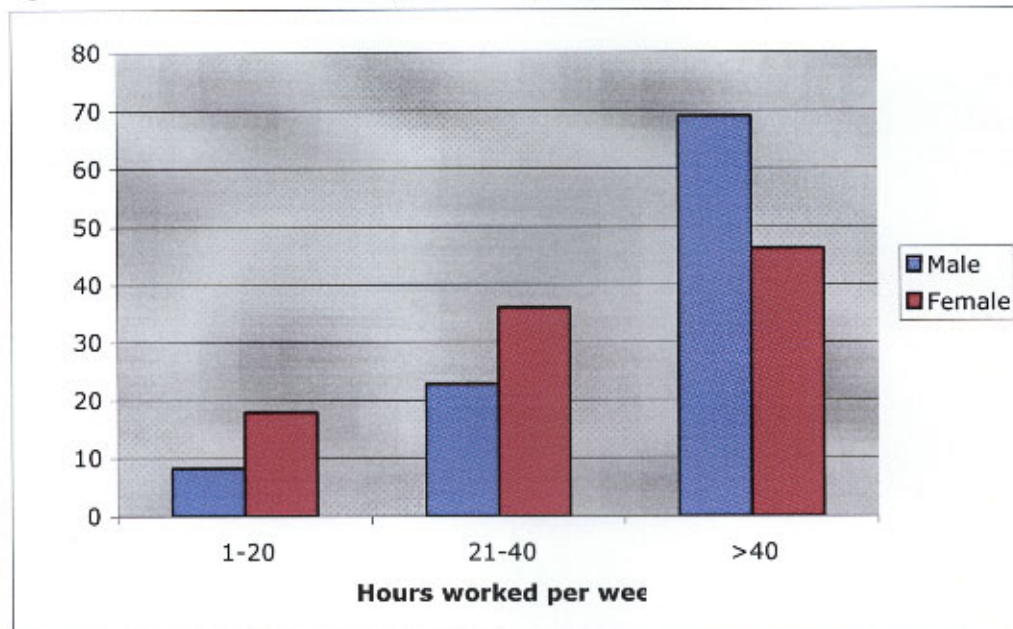
Gender	%	$\bar{X}$ Hours worked
Males	49	49
Females	51	39
Total (n)	374	44
Missing values*	45	

\*These were retired, doing home duties or not working as veterinarians.

Twenty-seven of the Phase 1 subjects responded to the Phase 3 questionnaire. The mean of the hours they worked per week was 50 (males worked 50 hours and females worked 48 hours a week). This indicates that the male subjects interviewed worked similar hours to Phase 3 respondents, however, females interviewed worked 8 hours a week more than Phase 3 female respondents. The proportion of females that work part-time compared with males is shown in Figure 5-3.

There was a significant association between males and females working 1-20, 21-40 and >40 hours a week ( $\chi^2=20.404$ ,  $p<0.001$ ).

**Figure 5-3** Hours worked per week grouped by gender



The average hours worked per week by case mix and gender is presented in Table 5-10.

**Table 5-10** Average hours worked per week by case mix by gender

Gender	Small animal $\bar{X}$ hours	Mixed animal $\bar{X}$ hours	Large animal $\bar{X}$ hours
Males	47	54	47
Females	32	53	40
Total (n)	38	53	45

Using the Kruskal-Wallis test, a non parametric test for significant association, a statistically significant association was found between the average hours worked per week by case mix of animals serviced ( $\chi^2=40.856$ ,  $p<0.001$ ). There was also a statistically significant association between hours worked and case mix for males ( $\chi^2=7.610$ ,  $p<0.05$ ) and for females ( $\chi^2=34.959$ ,  $p<0.001$ ).

It is interesting to note that males and females in mixed animal practice worked similar hours (54 hours versus 53 hours respectively), but there was a large difference between hours worked for males and females involved with

small animals. As noted previously, many more females worked part-time than males and most of these were in small animal practice.

While full-time work for employed veterinarians is 38 hours per week,<sup>189</sup> many employed veterinarians work in excess of this<sup>ii</sup> as do practice owners.<sup>ii</sup> For the purposes of analyses, 40 hours a week is regarded as a full-time workload.

The number of respondents working less than and more than a full-time load by case mix is presented in Table 5-11.

**Table 5-11 Working < or > 40 hours per week by case mix and gender**

	Hours worked per week	Small animal (%)	Mixed animal (%)	Large animal (%)
Males	Less than 40	35	20	39
	40 or more	65	80	61
	Total (n)	80	61	39
Females	Less than 40	54	28	47
	40 or more	46	72	53
	Total (n)	109	53	15
All	Less than 40	54	23	41
	40 or more	46	77	59
	Total (n)	189	114	54

There was a highly significant positive association ( $\chi^2=26.784$ ,  $p<0.001$ ,  $R=0.274$ ,  $p<0.001$ ) between hours worked per week and case mix. When those data were examined by gender, there was no significant association between working more than 40 or less than 40 hours per week across the three case mixes for males ( $\chi^2=5.299$ ,  $p=0.071$ ). On the other hand, for females there was a highly significant association between case mix and hours worked ( $\chi^2=22.895$ ,  $p<0.001$ ,  $R=0.359$ ,  $p<0.001$ ). There were many more females than males working less than 40 hours, however as previously shown, those working in mixed animal practice worked similar hours to their male counterparts. While results indicate that females worked fewer hours, this research project did not investigate the reasons as to why this occurred.

#### 5.2.3.5 *Effect of working hours on health and social life*

Respondents were asked how being on call after-hours affected their ability to sleep. Using the two extreme categories *little or no effect* and *having a major effect*, on how working after-hours affected sleep, the effect of after-hours call on sleep by gender is presented in Table 5-12.

Nearly 22% of all respondents claimed that being on call after-hours had a major effect on their ability to sleep, with another 43% moderately affected. Nearly 36% indicated that after-hours work had very little effect on their ability to sleep. An analysis was undertaken using only two categories: *No / little effect* and *Major effect* by gender which showed a statistically significant association between gender and the ability to sleep while on call after-hours ( $\chi^2=11.457$ ,  $p<0.01$ ), with females more affected than males.

**Table 5-12 Effect of after-hours duty on sleep by gender**

Effect on sleep	Males %	Females %	All %
No / little effect	43	28	36
Moderate effect	42	44	43
Major effect	15	28	22
Total (n)	150	156	306

The effect of after-hours work on *sleep* was compared for three age groups: <35 years, 35-54 years and >54 years (Table 5-13). A statistically significant negative association between the three age groups was demonstrated ( $\chi^2=9.170$ ,  $p<0.05$ ,  $R=-0.226$ ,  $p<0.01$ ) with respondents <35 years most affected and those >54 years least affected.

**Table 5-13 Effect of after-hours duty on sleep by age**

Effect on sleep	Age group		
	<35 yrs %	35-54 yrs %	>54 yrs %
No / little effect	25	28	61
Moderate effect	50	41	28
Major effect	25	22	11
Total (n)	113	157	36

A further comparison of the effect of after-hours duty on sleep for respondents working in the three types of animal practice was also calculated (Table 5-14).

**Table 5-14 After-hours work effect on sleep by case mix**

Effect on sleep	Case mix		
	Small animals %	Large animals %	Mixed animals %
No / little effect	29	69	37
Moderate effect	42	32	50
Major effect	29	9	13
Total (n)	153	32	115

Again, comparing responses for *little effect* and *great effect*, there was a significant association between the effect of after-hours work on sleep and case mix ( $\chi^2=12.034$ ,  $p<0.01$ ,  $R=-0.286$ ,  $p<0.01$ ). Small animal and mixed animal respondents were most affected by after-hours calls, while those working with large animals only were least affected.

Respondents were asked to indicate how being on duty after-hours affected their energy levels. Results by gender are presented in Table 5-15.

**Table 5-15** Perceived effect of after-hours duty on energy levels by gender

Effect on energy levels	Males %	Females %
No / little effect	30	16
Moderate effect	53	54
Major effect	17	31
Total (n)	149	155

Seventy-four (24%) respondents indicated that being on call after-hours had a major effect on their energy levels. There was twice the proportion of females compared with males affected and this was highly significant ( $\chi^2=12.408$ ,  $p<0.01$ ,  $R =3.577$ ,  $p<0.001$ ).

The effect of after-hours work on energy levels was made for the three age categories, < 35 years, 35-54 years and >54 years (Table 5-16).

**Table 5-16** Effect of after-hours duty on energy levels by age group

Effect on energy levels	Age group %		
	<35 yrs	35-54 yrs	>54 yrs
No / little effect	14	24	42
Moderate effect	56	53	47
Major effect	30	24	11
Total (n)	112	156	36

Again, comparing responses for *little effect* and *great effect* showed a statistically significant association between the three age groups. Those under the age of 55 years were most affected ( $\chi^2=12.034$ ,  $p<0.01$ ,  $R=-0.286$ ,  $p<0.01$ ). There was no gender difference between age categories and effect on energy levels.

Respondents were also asked how their family life was affected by their being on duty after-hours and the responses are presented (Table 5-17).

Table 5-17 Effect of after-hours duty on family life by gender

Effect on family life	Gender	
	Males %	Females %
No / little effect	16	12
Moderate effect	51	42
Major effect	33	46
Total (n)	151	154

One hundred and twenty-one (40%) respondents claimed that being on duty after-hours had a major effect on their family life while only 43 (14%) claimed it had little or no effect. Again, there was no gender difference for the effect of after-hours work on family life ( $\chi^2=5.396$ ,  $p=0.067$ ).

The effect of after-hours work on family life compared by age group is presented in Table 5-18.

Table 5-18 Effect of after-hours work on family life by age

Effect on family life	Age group (%)		
	<35 yrs	35-54 yrs	>54 yrs
No / little effect	14	10	30
Moderate effect	38	50	57
Major effect	48	40	13
Total (n)	112	156	37

Once again, a statistically significant association ( $\chi^2=16.683$ ,  $p<0.001$ ,  $R=0.197$ ,  $p<0.5$ ) was established for the effect of after-hours work on family life. Those >54 years were least affected, while males were more affected. ( $\chi^2=10.628$ ,  $p<0.01$ ). There were too few females in the >54 year group to enable a separate analysis to be undertaken.

#### 5.2.3.6 Job satisfaction

Using a series of questions taken from a standard job satisfaction scale,<sup>2</sup> respondents were asked if they were satisfied or dissatisfied with their present job as veterinarians. Eleven areas in the workplace were evaluated using a 5 point Likert Scale where responses ranged from *very dissatisfied* through to *very satisfied* (see Appendix H).

A three-point scale was established by collapsing the extremes of *very* and *extremely dissatisfied* and *very* and *extremely satisfied*. Responses are presented in Table 5-19.



Lack of promotional opportunities and/or a pay increase caused the greatest dissatisfaction, followed closely by pay rate and out-of-hours work or being on call. Fellow workers caused the least dissatisfaction. In contrast, the greatest satisfaction came from the amount of responsibilities, freedom to choose one's own way of working and physical work conditions.

**Table 5-19 Job satisfaction**

Job satisfaction feature	Dissatisfied/ very dissatisfied %	Unsure %	Satisfied/ very satisfied %
1. Physical work conditions	20	2	78
2. Freedom to choose own way of work	14	3	83
3. Fellow workers	8	6	87
4. Recognition for good work	29	10	62
5. Immediate boss or partner	20	7	73
6. Amount of responsibilities	12	5	83
7. Income or rate of pay	42	6	52
8. Opportunity to use abilities	20	5	75
9. Industrial relations	25	13	62
10. Chance of promotion or pay increase	46	18	37
11. Out of hours work or being on call	31	5	65

#### 5.2.4 Career choice

Respondents were asked (i) why they had become a veterinarian, and, (ii) if their expectations had been met. They were able to provide up to three reasons but most only provided one response. A love of animals was the most common response given by 49% of the sample. The next most frequent reasons were:

- it was a scientific course like medicine (12%)
- job satisfaction (10%)
- a desire to work in a rural environment or with farm animals (10%), and
- the challenge of doing such a hard course (9%)

The reasons for respondents choosing veterinary science as a career, support the findings of Heath and Lanyon in their 1996 longitudinal study of Queensland graduates.<sup>188</sup>

A Likert scale with four possible responses: *mainly/completely realised*; *realised somewhat*; *realised little*; and *realised not at all* was used for the second part of this question and pertained to expectations of becoming a veterinarian, being met. The expectation of becoming a veterinarian had been *mainly realised* by 62% of respondents, *realised somewhat* by 31% and *little or not at all* by only 7%. Thirty percent of respondents did not answer this question, in contrast to only 1% who did not respond to a question pertaining to happiness presented in Table 5-23.

### 5.2.5 Likelihood of remaining a veterinarian

Respondents were asked what was the likelihood of their being a veterinarian in five years' time (Table 5-20). The responses were reduced to three categories by collapsing the extreme items of *definitely* and *possibly*.

Only 196 (48%) indicated they were *definitely or possibly* going to be working as a veterinarian in five years' time. Eleven percent were *uncertain* and 23% indicated that they *possibly or definitely* would not be working as veterinarians. Similar responses were obtained from male and female respondents.

**Table 5-20 Likelihood of remaining a veterinarian**

Likelihood of remaining a vet in 5 yrs	Males %	Females %
Definitely/ possibly likely	62	70
Not sure	11	11
Definitely/ possibly not	28	19
Total (n)	199	210

When responses for the likelihood of being a veterinarian in five years were compared by age group, 16% of the total respondents under the age of 35 indicated they possibly or definitely would not working as veterinarians in five years time compared with nearly 21% in the 35-54 age-group and 49% over 54 years (Table 5-21).

**Table 5-21 Likelihood of remaining a veterinarian in 5 years by age**

Likelihood of remaining a vet in 5 yrs	<35 years %	35-54 years %	>54 years %
Definitely/ possibly will	70	70	42
Unsure	14	10	9
Possibly/ definitely not	16	21	49
Total (n)	140	209	59

Sixteen percent of respondents less than 35 years of age indicated they may not remain as veterinarians in 5 years' time, may be an indication of job dissatisfaction. Checking responses for likelihood of being a veterinarian in 5 years time for all respondents against the 11 job satisfaction items was revealing (Table 5-22).

Table 5-22 Likelihood of remaining a veterinarian by job satisfaction

Job satisfaction feature correlated with likelihood of remaining a veterinarian	$\chi^2$ and significance	Spearman R & significance
1. Physical work conditions	$\chi^2 = 21.746, p < 0.001$	$R = -0.254, p < 0.01$
2. Freedom to choose own way of working	$\chi^2 = 20.880, p < 0.001$	$R = -0.250, p < 0.01$
3. Fellow workers	$\chi^2 = 6.714, p < 0.05$	$R = -0.144, p < 0.01$
4. Recognition for good work	$\chi^2 = 10.720, p < 0.01$	$R = -0.186, p < 0.01$
5. Immediate boss or partner	$\chi^2 = 4.951, p < 0.05$	$R = -0.133, p < 0.05$
6. Amount of responsibilities	$\chi^2 = 4.477, p < 0.05$	$R = -0.120, p < 0.05$
7. Income or rate of pay	$\chi^2 = 3.613, p < 0.05$	$R = -0.105, p = 0.06$
8. Opportunity to use abilities	$\chi^2 = 6.734, p < 0.01$	$R = -0.143, p < 0.01$
9. Industrial relations	$\chi^2 = 6.402, p < 0.05$	$R = -0.147, p < 0.05$
10. Chance of promotion or pay increase	$\chi^2 = 7.463, p < 0.01$	$R = -0.165, p < 0.01$
11. Out of hours work or being on call	$\chi^2 = 2.492, p = 0.118$	$R = -0.089, p = 0.115$

The results indicate that there was an association between likelihood of remaining a veterinarian in five years' time and the job satisfaction scale for 10 of the 11 items.

The results of analyses for those under the age of 55 (respondents older than 55 may have retired) showed the associations to be of even greater significance for all 11 items.

Spearman Rho Rank correlations were undertaken to determine the strength and direction of the association and these results are presented in Table 5-22. The likelihood of remaining a veterinarian was negatively correlated with job satisfaction for all items except *out of hours work* and *income*. When veterinary respondents over 54 years of age were removed from the analyses, all 11 items on the job satisfaction scale showed significant negative correlations with the likelihood of remaining a veterinarian in five years time.

These results suggest that the reasons for not wanting to remain a veterinarian may have been related to dissatisfaction with one's job. When job satisfaction and the likelihood of remaining a veterinarian in five years

time were correlated for those respondents (152) who worked >50 hours per week, the results for the two items of *out of hours work* and *income*, were not significant.

There was no significant association between gender and likelihood of working as a veterinarian in five years' time.

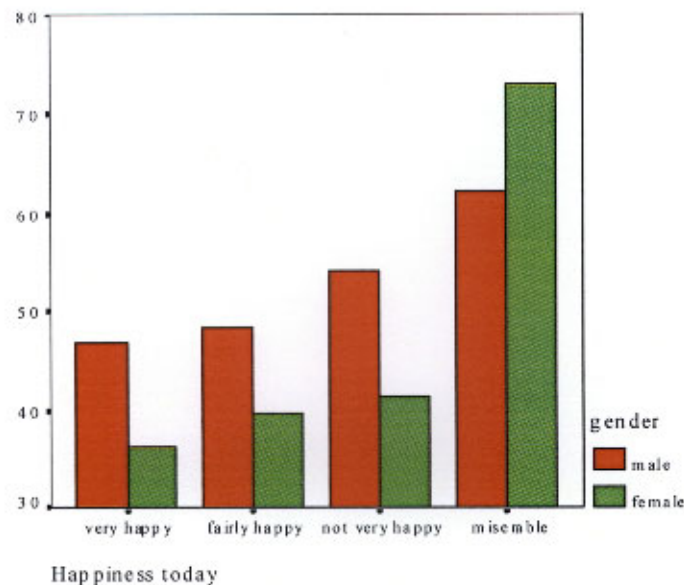
### 5.2.6 Happiness

Veterinarians were asked to rate their perceived *happiness today* at the time of completing the questionnaire using a four point Likert scale that ranged from *very happy* and *fairly happy* through to *not very happy* and *miserable*.

Eighty four percent of respondents considered themselves to be happy today with 16% unhappy or miserable. The mean number of hours worked per week for *happy* respondents was 43 hours per week, and for *unhappy* respondents was 50. Responses were significantly different between these two groups ( $F = 6.010, p < 0.05$ ). The extremes of *very happy* and *very miserable* were also examined. There was a significant difference between the *very happy* respondents who worked a mean of 41 hours and the *very miserable* who worked a mean of 65 hours ( $F = 9.645, p < 0.01$ ). Gender differences were demonstrated for hours worked by happiness (Figure 5-4).

There was no significant association between hours worked and happiness comparing gender. *Happy* males worked a mean of 45 hours a week compared with 48 hours a week for *unhappy* males ( $F = 4.630, p < 0.05$ ). *Happy* females worked a mean of 39 hours a week compared with 44 hours a week for *unhappy* females. This difference was not significant ( $F = 1.288, p = 0.258$ ).

Figure 5-4 Happiness today by hours worked by gender



Owners and associates worked different hours and this was associated with happiness. *Happy* owners worked a mean of 51 hours a week in comparison to *unhappy* owners who worked 59 hours. These results were significantly different ( $F=4651$ ,  $p<0.05$ ). In comparison, there was no significant association between hours worked and happiness for associates ( $F=0.609$ ,  $p=0.436$ ) with *happy* associates working a mean of 39 hours a week and *unhappy* associates working 43 hours a week.

Chi-squared analyses were undertaken for the effect of after-hours on sleep, energy, family life and happiness, which were all highly associated as follows:

- after hours on sleep and happiness ( $\chi^2 =14.882$ ,  $p<0.001$ ,  $R=-0.292$ ,  $p<0.001$ )
- after hours on energy and happiness ( $\chi^2 =14.039$ ,  $p<0.001$ ,  $R=-0.316$ ,  $p<0.001$ )
- after hours on family life and happiness ( $\chi^2 =14.973$ ,  $p<0.001$ ,  $R=-0.303$ ,  $p<0.001$ ).

This appears to indicate that undertaking after-hours work had a major and negative association with happiness.

### 5.2.7 Routine medical checks

A question about frequency of routine medical check-ups was included in the questionnaire to determine if respondents were concerned about their health. They were asked the last year they had had a routine preventive medical check-up (Table 5-23) and the frequency of their check-ups (Table 5-24).

One hundred and seven respondents (27%) indicated they had a check-up less than once every ten years. Surprisingly, a number of respondents failed to respond to this question. In-depth interviews would have provided more information on this.

**Table 5-23** When last routine preventive medical check-up occurred

Check up occurred:	n	%
In last 2 years	223	74
3-4 years ago	46	15
5-10 years ago	26	9
11-20 years ago	3	1
Never	3	1
Total (n)	301	100
Missing responses	118	

**Table 5-24** Frequency of routine medical check-ups

Frequency of medical check-up	n	%
Once each year	119	30
Once in 2-3 yrs	111	28
Once in 4-5 yrs	38	9
Once in 6-10 years	21	5
< once in 10 years	106	27
Never	1	0
Total (n)	396	100

There were some inconsistencies in responses as to when respondents last had a routine medical check-up (Table 5-23) and the frequency of such check-ups (Table 5-24). The results reveal that a substantial number of veterinarians do not have regular medical check-ups but when age group and frequency of medical check-ups were compared, there was no significant association between these ( $\chi^2 = 8.653$ ,  $p = 0.124$ ) (Table 5-25).

**Table 5-25 Age group by frequency of check-ups**

Age group (years)	At least once in 5 years (%)	Less than once in 5 years (%)
<25	4	6
25-34	30	31
35-44	30	39
45-54	20	16
>54	17	9
Total (n)	267	127

There was no significant association between age groups and frequency of medical checkups. The frequency of medical check-ups by gender is presented in Table 5-26.

When gender and frequency of medical check-up were compared, male veterinarians less than 35 years had the least number of check-ups; 64% had a medical check-up less than once in five years. Females less than 35 years visited a doctor at more than twice the rate of the males and check-ups for males and females in the 35-54 age group was similar. The higher rate in females <35 years could be related to reproductive matters such as obtaining contraception from doctors.

**Table 5-26 Frequency of medical check-up by age group and gender**

Gender	Frequency of check-up	Age group		
		<35 yrs %	35-54 yrs %	>54 yrs %
Male	At least once in 5 yrs	36	66	79
	< once in 5 yrs	64	34	21
	Total (n)	29	112	52
Female	At least once in 5 yrs	73	64	100
	< once in 5 yrs	27	36	0
	Total (n)	106	90	5

There was no significant association between frequency of medical check-up by age group ( $\chi^2=5.117, p=0.077$ ) for the entire cohort. However, there was a significant association between age group and frequency of check-ups for males ( $\chi^2=11.662, p<0.01$ ) but not for females ( $\chi^2=3.781, p=0.418$ ). Being married, or having been injured had no effect on the frequency of regular check-ups.

### 5.2.8 Risk taking

Using a four point Likert scale of *often*; *sometimes*; *rarely*; and *hardly ever*, respondents were asked to indicate what type of risks they took in their job when they first graduated and what risks they took at the time of responding.

For ease of data analysis, *often* and *sometimes* were collapsed into one group for risk taking as were *rarely* and *hardly ever* into another group providing two categories. These results comparing *risk taking now* by *risk taking when first graduated* are shown in Table 5-27.

**Table 5-27 Risk taking when first graduated and now**

Risks taken now	Risks taken when first graduated	
	Often (%)	Rarely (%)
Often	43	4
Rarely	57	96
Total (n)	264	131

Both owners and associates reported similar levels of risk taking. Respondents indicated they were much more conscious of safety at the present time than when they first graduated and this association was highly significant ( $\chi^2=61.676, p<0.001$ ).

### 5.2.9 Anger

The frequency with which respondents became angry at work was recorded (Table 5-28). Almost 70% of veterinarians indicated that they were rarely angry or, only became angry about once a week. However, 12% indicated they were angry about once a day, while 5% percent indicated they became angry several times a day.

**Table 5-28 Anger frequency**

Anger frequency	%
Several times a day	5
Once a day	12
Once in 2-3 days	14
Once a week	16
Rarely	53
Total (n)	403



There was no association between gender and frequency of becoming angry ( $\chi^2 = 3.525$ ,  $p = 0.067$ ) and no association between frequency of becoming angry and injury ( $\chi^2 = 0.302$ ,  $p = 0.591$ ) (Table 5-29).

**Table 5-29 Injury by anger frequency**

Anger	Injured	
	No injury (%)	Yes injury (%)
Rarely	71	68
Often	29	32
Total (n)	187	216

Respondents were also asked to whom their anger was directed. More than one response could be provided.

There were 645 responses from the 419 respondents. The most frequently marked response was self or no-one (64%), followed by family (20%), nursing staff (8%), veterinary staff (4%), clients (3%) and friends (1%).

#### 5.2.10 Substance use

Respondents were asked about their use of a number of substances, including alcohol, cigarettes and drugs, both legal and illegal. The results appear in the next subsection.

##### 5.2.10.1 Alcohol

Use of alcohol was assessed using categories developed by the National Health and Medical Research Council (NHMRC) for risk behaviours for alcohol consumption.<sup>190</sup> Three categories: *low risk*, *risky* and *high risk* were used. Alcohol risk by category by gender is presented in Table 5-30.

**Table 5-30 Risk category for alcohol consumption by gender.**

Gender	Alcohol risk		
	Low risk %	Risky %	High risk %
Males	49	39	67
Females	51	61	33
Total (n)	370	26	6

When alcohol risk by gender was assessed, 32 (8%) respondents were in the *risky* or *high risk* groups for alcohol consumption. There was no significant difference between alcohol risk groups and gender and no statistically

significant association between the three alcohol consumption groups and frequency to become angry. On the other hand, the findings of Reijula *et al.*<sup>16</sup> in their study of Finnish veterinarians showed a higher proportion of male veterinarians consuming more alcohol per week than female veterinarians, but less than a comparable group of surgeons.

#### 5.2.10.2 Cigarettes and antidepressants

Most respondents were non-smokers. Only 22 (11 males and 11 females) or 6% of the cohort, smoked from 1-50 cigarettes a day, with a daily average of 15. This was a similar proportion of veterinarians smoking as was found in the Finnish study, which also was about half that of the general population.<sup>16</sup>

Prescribed antidepressants were taken by 30 (12 males and 18 females) or 7% of respondents. Another five respondents indicated they took non-prescription anti-depressants. There was no significant association between anger levels or injury rates for those taking antidepressants.

#### 5.2.10.3 Other drug taking

Respondents indicated their drug use for non-medical purposes during the previous 12 months (Table 5-31). The questions for this section of the questionnaire were adapted from those used in the National Drug Strategy Survey.<sup>191</sup> Approximately 20% of respondents did not answer the question on drug taking in the past 12 months.

Table 5-31 Proportion taking non-prescription drugs in last 12 months

Drug taken	Yes %	No %
Pain killers/ analgesics	16	69
Tranquillisers/ sleeping pills	8	74
Marijuana	6	74
Ecstasy	4	78
Amphetamines	3	75
Steroids	1	76
Hallucinogens	1	79
Non prescribed antidepressants	1	78
Cocaine	1	79
Heroin	1	76
Ketamine	1	79
Inhalants	0	79
Pethidine	0	79
Barbiturates	0	77

Pain killers and tranquillisers were the major drugs used by respondents followed by marijuana, ecstasy, amphetamines, hallucinogens and antidepressants. The percentage of respondents using social drugs in the previous 12 months was as follows: marijuana (6%), ecstasy (4%), amphetamines (3%) and hallucinogens (1%). No respondent indicated using pethidine or barbiturates, which according to the Registrar, Veterinary Surgeons Board of Western Australia, does not accurately reflect what is happening in the veterinary profession, at least, in Western Australia.<sup>kk</sup>

### 5.3 OCCUPATIONAL INJURIES

Occupational injuries were recorded for respondents and analyses carried out to determine if there were any patterns linked with demographics of the profession. These are described in the following subsections.

#### 5.3.1 Major injuries requiring time off work

Respondents provided details about major workplace injuries that necessitated at least half a day off work. The vast majority of respondents did not take time off work and continued working even when they had apparently serious injuries. Many respondents indicated that their injuries limited some activities for up to two weeks. For example, many severe dog and cat bites resulted in an inability to scrub their hands and undertake surgery.

Fifty three percent of veterinarians had experienced at least one acute injury requiring half a day or more off work during their veterinary career. Of those injured, the range was from 1-4 major injuries with a mean of 1.8 injuries per person. Information about the actual length of time off work was not requested.

Annual rates of injury were not requested and the lifetime rates were similar to those found by Landercasper<sup>13</sup> and Langley,<sup>12</sup> but their study samples were either solely or primarily large animal veterinarians. Two other Australian surveys show similar rates<sup>4,20</sup> and recent preliminary data from Fritschi *et al.* also supports this rate.<sup>87</sup>

Demographic data obtained earlier was used to determine if any risk factors listed in Figure 4-1 played a part in veterinarians becoming injured. While some analyses considered the number of injuries that had occurred, most analyses used an ordinal response of injured or not injured. The results of these analyses follow.

### 5.3.2 Injury, age and gender

Age and gender were cross-tabulated with injuries, to explore possible determinants for injury. The statistics for injury by age group and gender are displayed in Table 5-32.

**Table 5-32 Injury by age group and gender**

	Injury/ No injury	< 25 yrs (%)	25-34 yrs (%)	35-44 yrs (%)	45-54 yrs (%)	>54 yrs (%)
Males	No injury	100	48	47	32	47
	Injury	0	52	53	68	53
	Total (n)	4	27	58	56	60
Females	No injury	57	52	39	50	80.0
	Injury	43	48	61	50	20.0
	Total (n)	14	96	76	20	5
All	No injury	67	51	42	37	49
	Injury	33	49	58	63	51
	Total (n)	18	123	134	76	65

Injuries occurred across all age groups with more injuries occurring in males in the 45-54 age group and in the 35-44 age group for females. The non-parametric Kruskal-Wallis Test showed there was no significant association between injury and age group ( $\chi^2=8.111, p=0.150$ ). Gender was not associated with injury and age group for males ( $\chi^2=8.795, p=0.118$ ) or for females ( $\chi^2=5.369, p=0.251$ ).

No significant association was found between injury and age groups <35, 35-54 and >54 years and a comparison between private practitioners and non-practitioners, such as government veterinarians, showed that there was no difference in their rates of injury.

It was expected that older male and female veterinarians would have had the most injuries because of longer exposure. However, this was not the case.

### 5.3.3 Injury and marital status

Data concerned with whether respondents were injured or not, was cross-tabulated with marital status and are presented in Table 5-33. Being married was not associated with whether a respondent was injured, or not, or the number of injuries respondents incurred.

Table 5-33 Injury and marital status

Injured	Married %	Not married %
No	47	42
Yes	53	58
Total (n)	346	69

### 5.3.4 Injury and practice ownership

Practice ownership was cross-tabulated with injury to determine if practice owners or associates were more prone to injury (Table 5-34).

Table 5-34 Practice ownership and injury

Injured	Owner %	Associate %
No	38	50
Yes	62	50
Total (n)	140	189

Respondents who owned the practice alone or in partnership, had a significantly higher rate of injury than did associates ( $\chi^2=4.514$ ,  $p<0.05$ ). Age group, length of time working as a veterinarian, hours worked and gender were not significantly associated with practice ownership and injury.

### 5.3.5 Injury and case mix of animals

The responses for those respondents injured and the case mix are presented in Table 5-35. There was a significant relationship between injury and case mix. Injuries were received by 46% of those working with large animals, by 49% working with small animals and 65% working with mixed animals ( $\chi^2=10.232$ ,  $p<0.01$ ). These statistics did not take into account the severity of injuries.

**Table 5-35 Injuries by case mix of animals**

Injured	Small animals	Large animals	Mixed animals
	%	%	%
No	51	54	35
Yes	49	46	65
Total	207	59	124

Comparing injury rates by gender and case mix of animals worked with, the association was statistically significant for males ( $\chi^2=6.720$ ,  $p<0.05$ ,  $R=0.151$ ,  $p<0.05$ ) but not for females ( $\chi^2=3.875$ ,  $p=0.144$ ).

It was thought that the association between injury and case mix of animals might have been because injuries occurred from working with large animals. Data from mixed and large animal practitioners were collapsed together to compare injuries in those working with large animals, with those working only with small animals. There was no significant difference in rate of injury between those working with small and large animals ( $\chi^2=1.558$ ,  $p=0.242$ ). Most respondents did not indicate whether large or small animals directly caused their injuries.

The number of injuries incurred by those treating small and large animals is presented in Table 5-36.

**Table 5-36 Number of injuries by small and large animals**

Number of injuries	Small animals	Large & mixed animals
	%	%
0 injuries	51	41
1-2 injuries	42	38
3-4 injuries	7	21
Total (n)	207	183

Over 50% of those working with small animals had no injuries compared with 41% of those respondents working with large animals. Similarly, 7% of respondents working with small animals received 3-4 major injuries compared with 21% who worked with large animals. There was no significant association between respondents working with small and large animals and number of injuries ( $\chi^2=2.923$ ,  $p=0.131$ ).

The association of gender with the number of injuries by large and small animals is shown in Table 5-37.

**Table 5-37 Number of injuries by animal type and gender**

Gender	Number of injuries	Small animals	Large animals
		%	%
Male	0 injuries	48	39
	1-2 injuries	41	39
	3-4 injuries	11	21
	Total (n)	85	107
Female	0 injuries	53	43
	1-2 injuries	42	37
	3-4 injuries	5	20
	Total (n)	122	76

### 5.3.6 Injury and hours worked

Comparisons were made between those respondents who were injured and those who were not, and, hours worked per week using grouped hours from 1-10 through to > 60 hours per week (Table 5-38).

There was no association found between respondents working longer hours and working shorter hours and injury rate ( $\chi^2=9.447$ ,  $p=0.150$ ).

**Table 5-38 Percentage of respondents by hours worked per week**

Injured	Hours worked per week						
	1-10	11-20	21-30	31-40	41-50	51-60	>60
Yes	53	53	57	40	55	41	36
No	47	47	23	60	45	59	64
Total (n)	34	19	28	79	91	61	59

There was also no association found for males ( $\chi^2=5.024$ ,  $p=0.541$ ) and females ( $\chi^2=4.515$ ,  $p=0.607$ ) for hours worked and injury rates. There were also no significant differences among these factors and small ( $\chi^2=12.092$ ,  $p=0.060$ ), large ( $\chi^2=6.458$ ,  $p=0.374$ ) and mixed animal groupings ( $\chi^2=3.875$ ,  $p=0.694$ ).

Injury data was compared by case mix (small, large and mixed animal) for respondents who worked more than or less than 40 hours a week (Table 5-39). Of the small animal respondents, 49% had an injury compared with 44% of large animal respondents and 66% of mixed animal respondents. Mixed animal veterinarians showed the highest proportion of injuries for working both more and less than 40 hours a week.

**Table 5-39 Injury rate by case mix by hours worked**

Hours worked/ week	Injured Yes or No	Small animal (%)	Large animal (%)	Mixed animal (%)
<40 hours	No	51	545	18
	Yes	49	45	82
	Total (n)	102	22	27
≥ 40 hours	No	51	56	39
	Yes	49	44	61
	Total (n)	87	32	87

There was a significant association between injury and case mix ( $\chi^2=9.879$ ,  $p<0.05$ ) for those working less than 40 hours a week, but not for those working more than 40 hours a week ( $\chi^2=3.727$ ,  $p=0.155$ ).

### 5.3.7 Injury and years worked

Years worked in practice were grouped into three categories: those working less than 10 years; those working 10-19 years and; those working 20 or more years. These categories were correlated with whether respondents had been injured or not. There was no difference in injury rate among these three groups ( $\chi^2=4.102$ ,  $p=0.129$ ). There was no significant association between those injured, and not injured, and years worked for either practice owners or associates ( $\chi^2=2.824$ ,  $p=0.244$ ).

A Chi-squared goodness of test for injury levels showed no significant difference between those working and not working at the time of completing the questionnaire ( $\chi^2=2.305$ ,  $p=0.129$ ).

### 5.3.8 Injury and risk taking

Respondents had previously indicated their degree of risk taking when they first graduated and at the time they completed the questionnaire. The results of a comparison between respondents' risk taking when first graduated and at the time of completing the questionnaire, and the resulting injury rate, is presented in Table 5-40.

There was a significant association between injury rates and risk taking when first graduated ( $\chi^2=29.915$ ,  $p<0.001$ ,  $R=-0.270$ ,  $p<0.001$ ). The rates for males and females were similar and were highly significant for risk taking when first graduated and whether injured or not. For males, significance was



$\chi^2=8.465$ ,  $p<0.01$ ,  $R=-0.206$ ,  $p<0.01$  and for females it was  $\chi^2=21.623$ ,  $p<0.001$ ,  $R=-0.320$ ,  $p<0.001$ . There was no association between injury and risk taking at the time of completing the questionnaire ( $\chi^2=3.171$ ,  $p=0.079$ ).

**Table 5-40 Injury rate & risk taking when first graduated**

Injury	Risk taking when first graduated		
	Often (%)	Rarely (%)	Total (n)
Yes	79	22	223
No	53	47	187

Further results concerning back injuries and risk taking are presented in section 5.3.13.4.

Practice owners experienced more injuries than associates (section 5.3.4) but both practice owners ( $\chi^2=11.659$ ,  $p<0.01$ ,  $R=-0.291$ ,  $p<0.01$ ) and associates ( $\chi^2=17.959$ ,  $p<0.001$ ,  $R=-0.311$ ,  $p<0.01$ ) showed a significant association established between injury and risk taking when first graduated.

There was no association established between risk taking at the time of administering the questionnaire and injury for owners and associates.

### 5.3.9 Injury and substance use

Respondents were asked if they had taken non-prescribed drugs, for example, pain killers and amphetamines over the previous 12 months. The responses are compared with injury in Table 5.41.

**Table 5-41 Injury by taking drugs over previous 12 months**

Injury	Taking drugs in past 12 months		Total (n)
	Yes (%)	No (%)	
Yes	30	70	224
No	21	79	193

There was only a marginal association between drug taking in the previous 12 months and injury ( $\chi^2=3.673$ ,  $p=0.055$ ).

The rate of injury by alcohol intake risks for male and female respondents is presented in Table 5-42.

Just over 20% of female respondents who were in the risky and high risk categories for alcohol consumption had been injured compared with 11.8% of

males in the same risk groups. There was no significant association established between injury rate, alcohol risk group and gender. There was, however, an association between marijuana use and injury ( $\chi^2=6.318$ ,  $p<0.05$ ,  $R=-0.138$ ,  $p<0.05$ ) but no association between injury and other drugs taken including antidepressants and smoking in the previous 12 months. Marijuana use has been associated with car accidents<sup>192</sup> and its chronic use has been implicated with some mental health conditions including depression and onset of schizophrenic attacks.<sup>193</sup> There is little evidence from this study to determine if this was the case and further studies would need to be undertaken which investigated substance use and mental health.

**Table 5-42 Injury by alcohol intake risk group and gender**

Gender	Alcohol risk group	Injury %	No Injury %
Male	Low risk	88	94
	Risky	5	5
	High risk	7	1
	Total (n)	110	84
Female	Low risk	79	89
	Risky	11	6
	High risk	10	5
	Total (n)	107	101

### 5.3.10 Injury and job satisfaction

The 11 criteria for job satisfaction were correlated with whether the respondent had been injured or not. These data are presented in Table 5-43.

Three items on the job satisfaction scale, *physical work conditions*, *fellow workers* and *out of hours work/calls*, were significantly associated with respondents being injured. A Spearman Rank Correlation (R) was undertaken for the three items and ranged from  $R = -0.125$  to  $-0.139$  (significance ranged from  $p<0.01$  to  $p<0.05$ ), which suggests that the strength of the correlation was only weakly negative.

**Table 5-43 Job satisfaction associated with injury**

Job satisfaction feature associated with injury	$\chi^2$
1. Physical work conditions	6.938**
2. Freedom to choose own way of working	0.519
3. Fellow workers	6.990*
4. Recognition for good work	0.063
5. Immediate boss or partner	2.631
6. Amount of responsibilities	2.470
7. Income or rate of pay	0.337
8. Opportunity to use abilities	0.319
9. Industrial relations	2.772
10. Chance of promotion or pay increase	2.193
11. Out of hours work or being on call	5.529*

\* p<0.05 \*\* p<0.01

Nevertheless, the results indicate that satisfaction with physical work conditions, fellow workers and doing out of hours work or being on call were negatively correlated with being injured. In other words, dissatisfaction with these three areas might contribute to being injured.

### 5.3.11 Injury types

Respondents were asked about the types of injuries causing time off work. The major injuries are tabulated in Table 5-44. The table shows the proportion of serious injuries incurred. For example, 23% of all serious injuries were dog and cat bites and back injuries formed 22.4% of the total. A subsequent question on back injury in the past 5 years showed a much higher rate of injury (section 5.3.13) and this incongruity is discussed in that section.

**Table 5-44 Type of injury received as a percentage of total injuries**

Type of injury	% of total injuries
Dog and cat bites and scratches	23
Back injuries	22
Broken hand, wrist, finger and lacerations	16
Needle-punctures and unspecified lacerations	11
Broken leg & severe laceration to legs (excl. knees)	8
Arm, shoulder, elbow fractures & hyperextension	7
Fractured jaw, skull, face, concussion	6
Knee fractures, ruptured ligaments	4
Fractured ribs, chest and other fractures	2
Total (n)	100

The most frequently reported injuries were dog, cat bites and scratches (23%) followed by back injuries (22%) and major fractures to the hand, wrist or fingers (16%). Of the total injuries, 24% were from small animals, 25% from large animals and the remaining 51% of respondents did not designate the animal species. The results of this study for injury to large and mixed animal respondents are similar to the findings of the survey of Australia cattle veterinarians.<sup>20</sup>

Most respondents did not indicate how their injuries had occurred, except for back injury where several respondents indicated their injury was caused by lifting weights that were too heavy or straining their back when delivering calves or foals.

### **5.3.12 Treatment of injuries**

Of the 54% of respondents who had received a serious injury, 85% stated that a doctor, physiotherapist or specialist treated them. Only 12% indicated that they treated themselves. There were several respondents who wrote that they x-rayed and diagnosed the fractures themselves prior to going to the hospital or visiting their doctor. Those who stated they treated the injury themselves, did so mainly for lacerations from dog or cat bites, strains, sprains or bruises. Some sutured themselves, but generally only when it was difficult to obtain medical attention. Some respondents indicated that they sought medical attention only when a wound became infected. There were 46% who did not respond to this question and these were all veterinary respondents who had not been injured.

Respondents were asked separate questions about back or repetitive strain injuries and motor vehicle accidents.

### **5.3.13 Back injuries**

Veterinarians were asked if they had ever had a work-related back injury in the past five years. Just over half of the 402 respondents (51%) indicated they had received a work-related back injury in the past 5 years and almost 30% experienced moderate to severe pain.

There is an apparent incongruity in the findings here and those previously reported in section 5.3.11 where back injuries formed only 22% of the total number of injuries. This latter figure was the proportion of total injuries incurred by the 419 respondents whereas the 51% refers to the proportion of respondents reporting a back injury. The degree of disability and pain that had occurred with the back injury is presented in Table 5-45 and this shows the impact of a back injury on the veterinarian.

**Table 5-45 Disability from back injury over past 5 years**

Disability from back injury	%
None/niggling pain	70
Moderate pain/little to moderate disability	26
Much pain/moderate to much disability	3
Total (n)	402

#### 5.3.13.1 Back injuries and age

Back injuries incurred by respondents in the previous five years by three age groups, <35, 35-54, >54 years, were compared (Table 5-46).

**Table 5-46 Back injury in past 5 years by age group**

Back injury	Age group %			Total
	<35 yrs	35-54 yrs	>55 yrs	
No injury	41	52	58	196
Yes injury	59	48	42	205
Total (n)	138	206	57	401

A surprising number of respondents <35 years indicated they had had a back injury in the previous five years (59%). Of those >54 years, 42% had incurred a back injury. Back injuries were found across all age groups and there was no significant association between having had a back injury and age group ( $\chi^2=5.782$ ,  $p=0.056$ ). One would possibly have expected to see more back injuries in older respondents because of increased exposure time.

#### 5.3.13.2 Back injuries and hours worked

Comparison was made between those with and without a back injury, and hours worked. Respondents with back injuries worked a mean of 48 hours while those without a back injury worked 40 hours. The association between back injury and working hours using ANOVA was highly significant ( $F=12.045$ ,  $p<0.001$ ). Males with injured backs worked longer hours with a

mean of 53 hours per week compared with those without a back injury who worked a mean of 46 hours per week. Similarly, females with a back injury worked longer hours with a mean of 44 hours per week than those without a back injury who worked 34 hours per week. However, the difference between males and females for working hours and back injury was not significantly different.

### 5.3.13.3 *Back injuries and case mix of animals*

Back injuries were compared by case mix (Table 5-47).

**Table 5-47 Back injury by case mix**

Back injury	Small animals %	Large animals %	Mixed animals %
No injury	52	59	41
Yes injury	48	41	59
Total (n)	204	59	123

There was a significant association between back injuries and case-mix of animals ( $\chi^2=6.625$ ,  $p<0.05$ ,  $-0.92$ ,  $p=0.07$ ), with most occurring in those who worked with mixed animals. One might have expected that those working with large animals could have more back injuries. Comparing all those working with large animals (mixed and large animals) and comparing back injuries with those working with small animals showed no significant association.

The proportion of respondents with back injuries support the findings of other studies.<sup>16, 20</sup> Reijula *et al.*<sup>16</sup> in their study of Finnish veterinarians indicated that driving posture contributed to veterinarians' low back pain, diseases of intervertebral discs, and neck and shoulder tension. Unfortunately the current study did not request information about the amount of work-related driving or about posture.

### 5.3.13.4 *Back injuries and risk taking*

Back injuries and risk taking for veterinarians when first graduated and risk taking at the time of administration of the questionnaire, are tabled (Table 5-48).

**Table 5-48 Back injury and risk taking**

Back problem in past 5 years	Risk taking			
	When first graduated		At present time	
	Risks often (%)	Risks rarely (%)	Risks often (%)	Risks rarely (%)
Yes	58	24	62	46
No	42	74	38	54
Total (n)	263	132	116	269

Back injury and taking risks when first graduated were significantly associated ( $\chi^2=15.030$ ,  $p<0.001$ ,  $R=0.195$ ,  $p<0.001$ ) as was back injury and taking risks at the time of the interview ( $\chi^2=7.895$ ,  $p<0.01$ ,  $R=0.143$ ,  $p<0.01$ ). These results suggest that respondents may have injured their backs after taking risks however there was no question asked if back injury were related to risk taking.

#### 5.3.14 Repetitive strain injuries

Veterinarians were asked if they had been affected with pain and disability from work-related repetitive activities such as pregnancy testing cattle and horses, giving repeated injections or from overuse of a computer in the past five years. Pain from repetitive activities affected 40.9% of 401 respondents (Table 5-49).

Most (73%) of the 401 respondents indicated they had only niggling pain from their repetitive activities. Only 25% indicated they experienced moderate disability to moderate pain and just 2% reported to having much pain and moderate to much disability from the repetitive activities.

**Table 5-49 Pain and disability from repetitive activities**

Disability from repetitive actions	%
None / niggling pain	73
Mod pain / little to moderate disability	25
Much pain / mod to much disability	2
Total (n)	401

The Likert scale used for pain and disability from repetitive activities was collapsed into two groups: *none/niggling pain* and, *moderate pain and little disability* formed one group; the other was *moderate to much pain* through to *moderate to much disability*. These two groups were then tabulated by case mix of animals (Table 5-50).

**Table 5-50 Repetitive activities causing pain and disability by case mix**

Pain & disability	Small animals (%)	Large animals (%)	Mixed animals (%)
Little or no pain & disability	98	93	88
Much pain	2	7	12
Total (n)	205	59	123

Large and mixed animal respondents were more likely to experience pain and disability from repetitive action, than those working with small animals, and this result was highly significant ( $\chi^2=44.733$ ,  $p<0.001$ ).

### 5.3.15 Number of motor vehicle accidents and injuries

Sixty-two (27%) of those that responded to this item in the questionnaire (15% of the study sample) had been involved in from 1 to 9 work-related motor vehicle accidents. Surprisingly, very few of the respondents were seriously injured. The injuries varied from mild to severe bruising, fractured ribs, arms and knees, whiplash and back injuries, and concussion.

Associates and owners incurred motor vehicle accidents at the same rate and there was no association between having had a motor vehicle accident for small, large or mixed animal practitioners ( $\chi^2=2.085$ ,  $p=0.352$ ).

### 5.3.16 Summary of risk factors for injury using $\chi^2$

In summary, Chi-squared analyses showed that those respondents working with mixed animals, were more likely associated with injury and those who indicated they took risks when they first graduated were significantly more associated with injury than those who said they didn't take risks. It is interesting to note that those who had incurred a back injury in the previous five years also worked longer hours than those without back injuries and were significantly more likely to have incurred other occupational injuries, although length of working hours and injuries were not significantly associated.

Three items on the job satisfaction scale were significantly associated with injury. These were physical facilities, fellow workers and undertaking out of hours work, however when these were included in the logistic regression analysis they were eliminated as risk factors.



No relationship was established between being injured and age, gender, marital status, hours worked, alcohol intake, smoking, frequency of anger and having a high level of distress.

### 5.3.17 Logistic regression for injury

A stepwise logistic regression using multiple imputation for missing values was undertaken to determine predictors of injuries. The independent variables entered into the logistic regression model included: gender, case mix of animals, whether owner or associate, married or not, distress levels, whether respondents had incurred a back injury in the previous five years, working hours and age group. The regression analysis was undertaken twice: using the entire data set of 419 respondents and, using only those who were practitioners (343). The results for both practitioners and the entire cohort were similar.

The significance for the independent variables for adjusted odds ratios for injury for the entire data set is presented in Table 5-51 and Appendix I.

**Table 5-51 Odds ratio for variables affecting injury**

Variable	Significance	Estimate	95% Confidence Limits	
			Lower bound	Upper bound
Back injury versus no injury	p<0.001	2.23	1.47	3.38
Mixed versus small animals	p<0.06	1.57	0.98	2.51
Taken drugs in past 12 months versus no drug	p<0.05	1.57	0.98	2.53
Three age groups 35-54 yrs versus <35 yrs and >54 yrs	p<0.01	1.93	1.27	3.05

Using this model, regression analysis produced only three variables of any significance for predicting injuries and these were:

- having had a back injury in the previous five years
- being 35 –54 years of age
- taking drugs in the past 12 months.

It should be noted that *taking drugs over the past 12 months* was only marginally associated with injury using the Chi-square test, however, it assumed significance when used in the regression model.

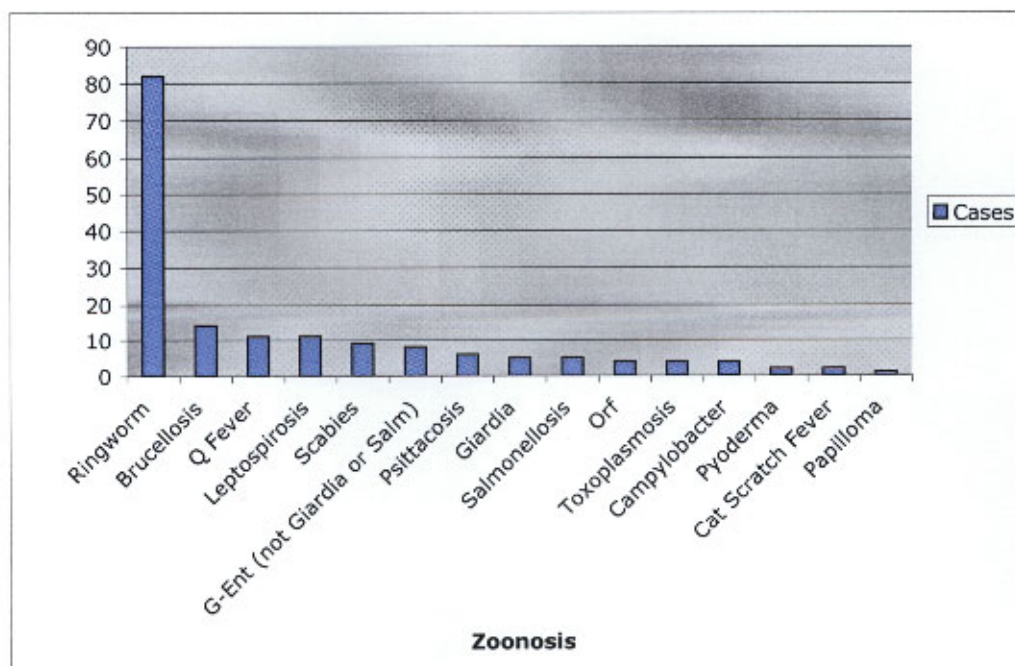
Mixed animal practice as a predictor of injury was of borderline significance with regression analysis. Preliminary regression analysis showed that practice ownership was also of borderline significance, however, it too was eliminated from the model. Details of logistic regression analyses are provided in Appendix I.

In summary, while earlier Chi-squared analyses showed that there were more injuries in those respondents who worked with mixed animals than small or large animals only and that owners were more likely to be injured than associates, these factors were not major predictors of injury when logistic regression was used. Back injuries, being 35-54 years of age and taking drugs in the past 12 months were predictors of occupational injuries in respondents.

#### 5.4 ZOONOSES

Respondents indicated how many occupational zoonoses they had experienced in their total career and the frequency of these diseases is shown in Figure 5-5.

**Figure 5-5 Incidence of zoonoses among veterinary respondents**



One hundred and forty two respondents had experienced 170 zoonoses. In other words, 34% of respondents incurred from 1-3 zoonoses. The major

zoonoses were ringworm (57%) followed by brucellosis (8%), leptospirosis (7%), Q fever (7%), scabies (5%), gastroenteritis (5%), ornithosis (4%), giardiasis (3%) and contagious ecthyma or scabby mouth, toxoplasmosis and campylobacteriasis (each 2%). Surprisingly, there were only 2 reports (1%) of cat scratch fever.

Ringworm and other skin zoonoses are generally regarded by veterinarians as trivial, while brucellosis, Q fever, leptospirosis, ornithosis and gastrointestinal are considered to be serious infections. Overall, nearly 15% of respondents had incurred a serious zoonotic infection. One respondent recorded that he had three serious zoonoses: brucellosis, leptospirosis and Q fever.

The analyses in this study only included serious zoonoses.

Zoonoses by case mix of animals is presented in Table 5-52.

**Table 5-52 Serious zoonoses by case mix of animals**

Zoonosis	Small Animals	Large Animals	Mixed Animals
	%	%	%
None or ringworm	87	78	76
Serious zoonosis	13	22	24
Total (n)	207	59	124

Just 13% of small animal respondents sustained a serious zoonotic infection while 22% and 24% of large and mixed animal respondents respectively had incurred a serious zoonotic disease. There was a significant association between case mix and serious zoonotic disease ( $\chi^2=7.334$ ,  $p<0.05$ ).

There was also an association with gender and having had a serious zoonosis ( $\chi^2=5.539$ ,  $p<0.05$ ) with 23% of males incurring a serious zoonosis compared with 14% of females. This result is not unexpected since there are many more males working in rural areas, thus increasing their exposure to major zoonotic diseases.

Interestingly, there were significant associations established between those respondents who sustained a serious zoonosis and their risk taking when first graduated ( $\chi^2=6.180$ ,  $p<0.05$ ) and risk taking at the time they answered the questionnaire ( $\chi^2=14.757$ ,  $p<0.001$ ).

A significant relationship was not determined between the overall number of zoonoses and the number of injuries sustained by respondents in this

investigation as a group ( $\chi^2=2.823$ ,  $p=0.101$ ). Nor was there any association between respondents having had a zoonosis and a motor vehicle accident which does not support the conclusions made by Schnurrenburger<sup>34</sup> that these are related.

## 5.5 FEMALE RESPONDENTS

Of the 209 female respondents asked specific questions relating to female activities and health, 92 (44%) indicated they had worked while pregnant and 68 (74%) of these had limited their activities because of the pregnancy. This compares with results from a Finnish study where 61% of female veterinarians had worked while pregnant and only 30% of these had limited their work activities.<sup>16</sup>

Fifteen respondents said they had experienced veterinary related reproductive problems. Of these, two indicated that their irregular menstrual cycles were caused by stress, while two others stated that their irregular cycles were due to accidental exposure to prostaglandins. Four others believed contact with veterinary drugs and anaesthetic gases had contributed to their having had miscarriage. One indicated her miscarriage was due to heavy farm work, while another female respondent indicated she had almost miscarried at 18 weeks gestation because she had lifted a heavy dog. There was no way of determining if spontaneous abortions were occupational.

When asked if there was risk to an unborn child from daily veterinary work, 52% of the 189 females that responded to this question believed there was a high or moderate risk of injury or disease compared with 48% who thought there was none or little risk (Table 5-53).

**Table 5-53 Female respondents' belief in amount of risk to unborn child**

Amount of risk	% belief in risk
high amount	14
moderate amount	38
low amount	42
none	5
Total (n)	189

Twenty one percent of the female veterinarians who responded indicated that they use a different name from their professional working name when they visit a doctor or are admitted to hospital. This has implications for the

accuracy of the outputs for females from data linkage obtained from the Health Department of Western Australia in Phase 2 of this study (Chapter 4).

## 5.6 EMOTIONAL HEALTH

A major objective of the self-directed questionnaire was to explore emotional health issues affecting respondents and to see how these either affected or were affected by other variables including injury rates.

A number of questions investigated emotional health and these included a psychological distress scale (PD), a job satisfaction scale (JS), questions about happiness, stressors in veterinary practice, coping strategies and the effect of after-hours duty on sleep, energy levels and family life.

Some of the results have already been reported and include:

- Effect of after-hours duty on sleep and social life (Section 5.2.3.5)
- Effect of after-hours duty on energy levels (Section 5.2.3.5)
- Effect of after-hours duty on family life (Section 5.2.3.5)
- Job satisfaction (Section 5.2.3.6)
- Happiness (Section 5.2.6)
- Anger (Section 5.2.9)
- Substance use (Section 5.2.10)

### 5.6.1 Psychological distress

An objective assessment of emotional health was undertaken to assess psychological distress (PD) using a standard scale (K10). Respondents were asked 14 questions about how they felt in the 4 weeks prior to completing the self-administered questionnaire. A 5-point Likert scale to indicate responses that varied from: *none of the time; a little of the time; some of the time, most of the time and all of the time was used.*

Responses to the first 10 questions (K10) by respondents, were used to provide a total score for psychological distress. The range was from 10-50: 10 indicating very low PD and a score of 50 was the maximum, which indicated very high PD. The scores for 412 respondents ranged from 10 - 49.

Psychological distress will be referred to as *distress*. The distress scores for the Phase 3 cohort are summarised in Table 5-54.

**Table 5-54 Percentage of respondents with Psychological Distress (PD) 1**

K10 distress level	%
10-15 low	47
16-21 moderate	32
22-29 high	17
30-50 very high	5
Total (n)	412

*High* and *very high*, and, *low* and *moderate* distress scores were collapsed together to enable easier comparison and analyses of two groups. As indicated previously in Chapter 3.4.2, people with scores of more than 30 are likely to have a severe mental health disorder.<sup>149</sup> Over 78% of respondents showed *low to moderate* distress and nearly 22% of veterinarians had *high to very high* distress levels.

A number of subjects previously interviewed from Phase 1, also responded to the questionnaire and their responses showed that there was no difference between their stress levels and Phase 3 respondents ( $\chi^2=0.319$ ,  $p=0.518$ ). This indicates that they have similar rates of distress as other Phase 3 respondents. They did however, differ significantly for rate of injury ( $\chi^2=12.361$ ,  $p<0.001$ ,  $R=-0.172$ ,  $p<0.01$ ).

The next part of this chapter reports on those variables identified as potential risk factors for those respondents who had high and very high distress levels.

### 5.6.2 Distress levels by age, gender and employment

Table 5-55 shows that respondents <35 years had significantly higher distress levels than older respondents ( $\chi^2=20.510$ ,  $p<0.001$ ).

**Table 5-55 Distress levels by 3 age groups**

Distress levels	<35 yrs %	35-54 yrs %	>54 yrs %
Low to moderate	70	79	93
High to very high	30	21	7
Total (n)	141	210	60

The association between the four psychological distress (PD) levels of low, moderate, high and very high scores by gender are presented in Table 5-56.

A significantly greater proportion of female veterinarians (27%) than males (16%) showed high and very high levels of PD ( $\chi^2=9.828$ ,  $p<0.05$ ,  $R=0.150$ ,  $p<.01$ ).

**Table 5-56 Distress levels by gender**

Distress level	PD Score	Male %	Female %
Low level	10-15	54	29
Moderate level	16-21	31	33
High	22-29	13	21
Very high	30-50	4	6
Total (n)		200	212

A comparison of the proportion of males and females in different age categories provided a greater understanding of the age group where distress occurred in male and female respondents (Table 5-57). Half the females under 25 years old and nearly 32% of females younger than 35 were more distressed than male colleagues in the same age groups.

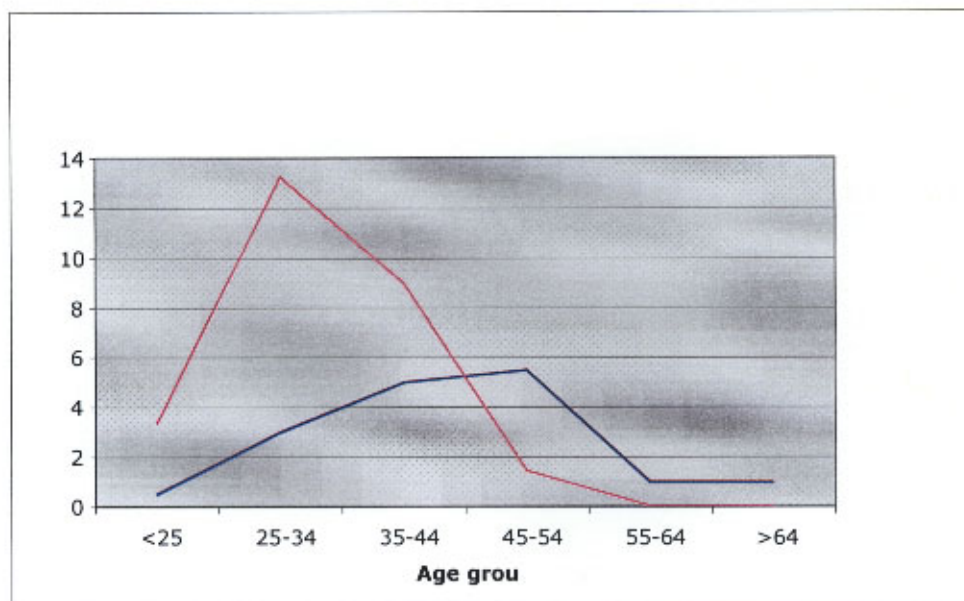
**Table 5-57 Distress scores by age and gender**

Gender	Distress score	Age group						Total
		<25 yrs %	26-34 yrs %	35-44 yrs %	45-54 yrs %	55-64 yrs %	>64 yrs %	
Male	10-21	75	78	83	80	95	88	168
	22-50	25	22	17	20	5	12	32
	Total (n)	4	27	58	56	39	16	200
Female	10-21	50	71	75	85	100	0	154
	22-50	50	29	25	15	0	0	57
	Total (n)	14	96	76	20	5	0	211

The disparity between the proportion of males and females with high distress is more obvious when a graph is used to compare the percentages of females and males in each age group by distress (Figure 5-6).

There were very few females over 55 years and only a few males under 35 years in the cohort of respondents. The proportion of females showing high distress was greatest in the younger age groups, especially those 25-34 years. The proportion of males with high distress levels increased up to the 45-54 age-group, but certainly not to the same proportion as the females. The proportions then decreased for both female and male older respondents.

**Figure 5-6** Percentage of respondents with high distress levels by age group and gender



Three age categories were grouped (<35 years, 35-54 years and over 54 years) and tabulated with distress levels (Table 5-58).

**Table 5-58** Distress score by three age groups by gender

Gender	Distress score	Age group		
		<35 years %	35-54 years %	>54 years %
Male	10-21	77	82	93
	22-50	23	18	7
	Total	31	114	55
Female	10-21	68	77	100
	22-50	32	22	0
	Total	110	96	5

Significant differences between the distress scores for the three age categories were evident, with those in the <35 age group showing the greatest distress ( $\chi^2=20.510$ ,  $p<0.001$ ). There was a significant difference ( $\chi^2=11.349$ ,  $p<0.05$ ) for distress levels by age group for males, however, it was not possible to determine significant difference between the age groups for females because there were too few in the over 54 age category.

A comparison was made between the percentage of male and female respondents with high distress (PD) by age with that of the NSW,<sup>184</sup> and



Western Australian general populations<sup>157</sup> (Table 5-59). Note that the figures presented are the proportions of individuals in each age group and therefore do not total 100%.

The results show that almost twice the proportion of male and female respondents in the 25-54 age groups have high psychological distress levels compared with three other general populations.

**Table 5-59 Comparisons between study sample and NSW and WA general populations for high psychological distress**

Age Group	Study Male %	Study Females %	NSW* Males %	NSW* Females %	WA <sup>#</sup> Males %	WA <sup>#</sup> Females %
16-24	25	50	12.2	20.3	12.2	14.6
25-34	22	29	11.0	13.2	10.8	13.5
35-44	17	25	10.5	15.0	8.6	11.9
45-54	20	15	11.4	15.0	10.2	10.9
55-64	5	0	8.8	11.1	9.4	10.1
65-74	13	0	7.2	8.7	7.1	8.4

\*184 # 157

There were twice as many respondents with high psychological distress levels as reported in two general populations.<sup>157, 184</sup> A comparison of the proportion of respondents with high PD in each age category with the NSW general population was highly significant ( $\chi^2=55.09$ ,  $p<0.001$ ) and highly significant when compared with the WA general population ( $\chi^2=91.34$ ,  $p<0.001$ ). It was also highly significant when compared with the proportion of persons with high PD for the National Health Survey on mental health undertaken by ABS in 2001<sup>154</sup> ( $\chi^2=60.13$ ,  $p<0.001$ ).

This confirms that the study sample of Phase 3 respondents were significantly more distressed than three other general Australian populations. While male and female respondents were significantly more distressed, the comparisons also revealed that there was a greater disparity between male and female respondents than occurred in the three general populations. This suggests that female practitioners may be subject to different types of pressures, which might contribute to an apparent emotional vulnerability. This aspect of the study may require further investigation to establish the main factors that contributed to increased stress among female practitioners.

Results from a comparison of distress levels in practitioners and non-practitioners are provided in Table 5-60.

Practitioners were more highly distressed than non-practitioners who comprised mainly government veterinarians ( $\chi^2=6.755$ ,  $p<0.05$ ,  $R=-0.128$ ,  $p<0.01$ ).

**Table 5-60 Employment type by two distress levels**

Employment category	Distress levels		Total (n)
	Low to moderate %	High to very high %	
Practitioner	76	24	341
Non-practitioner	90	10	70

A comparison of the two distress levels for the entire cohort of owners and associates by gender (Table 5-61) showed that associates were significantly more distressed than owners ( $\chi^2=4.823$ ,  $p<0.05$ ).

It was previously noted that females were more distressed than males, but there was no significant gender difference for distress associated with practice ownership or being an associate. Both female associates and female owners were more highly distressed than their male counterparts.

**Table 5-61 Distress levels by practice ownership by gender**

Distress level score	Owner		Associate	
	Male %	Female %	Male %	Female %
Low to moderate distress	82	73	84	70
High to very high distress	18	27	16	30
Total (n)	106	33	43	146

Other studies have not used objective measures when assessing stress levels of veterinarians. Reijula et al.<sup>16</sup> in their study of Finnish veterinarians used self-reporting to reveal that 73% experienced stress with a higher proportion of males more stressed than females. The VSB Survey of stress also used self-reporting and it showed that 65% of respondents were highly or moderately stressed (Appendix A). Heath found that perceived high and very high stress levels of veterinarians when they first graduated, was especially high for the cohort graduating in 1990, having doubled from levels perceived by those who graduated in 1980.<sup>195</sup>

There was no significant difference between stress levels for veterinarians not working at the time of the survey, compared with those who were working using a Chi-squared goodness of fit test ( $\chi^2=1.713$ ,  $p=0.191$ ).

This current study has objectively assessed psychological distress levels using the Kessler 10 scale, enabling comparisons to be made with the general population. The results indicate that respondents were significantly more distressed than the general population.

### 5.6.3 Responses to extra questions on K10+ scale

The four additional questions making up the K10+ scale were:

- Days unable to manage daily activities
- Days cut down on daily activities
- Times saw a health professional
- Physical problems causing feelings described in K10.

The responses to the four questions were only collated for those respondents scoring more than 15 on the K10 scale and, therefore, included respondents who had moderate, high or very high PD levels. This methodology was used in the NSW population survey.<sup>184</sup> Of the 392 veterinarians in this study who responded to the K10 questions, 56% of them scored more than 15 for PD on the K10 scale (Table 5-62). Responses are also compared with those reported in the NSW population study on health.<sup>184</sup>

**Table 5-62 Responses to extra questions for K10+ survey**

Four additional questions	Male $\bar{X}$	95% CI	Female $\bar{X}$	95% CI
<b>Research Study</b>				
Days unable to manage daily activities	0.4	.09-.87	0.6	0.25-0.90
Days cut down on daily activities	2.9	1.65-4.15	3.8	2.76-4.92
Times saw a health professional	0.2	0.06-0.34	0.3	0.11-0.43
Physical problems causing feelings	1.6	1.43-1.85	1.9	1.70-2.03
<b>NSW Health Study*</b>				
Days unable to manage daily activities	3.54	2.72-4.37	3.00	2.41-3.61
Days cut down on daily activities	3.04	2.45-3.63	3.68	3.14-4.24
Times saw a health professional	0.75	0.54-0.96	0.51	0.42-0.61
Physical problems causing feelings	NA	NA	NA	NA

\*184

Scores for respondents from this study *for days cut down on daily activities*, were similar to those for the NSW population (2.9 compared with 3.0 respectively) but differed markedly for *days unable to manage daily activities* (0.4 compared with 3.5 respectively). In addition, the number of times in the previous month when the individual had *visited a health professional*, was 0.2 for veterinary respondents compared with 0.8 for the NSW general population. This suggests that the respondents did not use the services of health professionals as much as the general population.

#### 5.6.4 Distress levels and marital status

Marital status was correlated with distress to determine if it influenced distress levels. Two categories of low to medium distress and, high to very high distress, were compared with marital status and the results are presented in Table 5-63.

Although there were higher distress levels in those who were not married, compared with those who were married, there was no statistically significant association between marital status and distress levels ( $\chi^2=3.718$ ,  $p=0.077$ ).

**Table 5-63 Distress levels by marital status**

Marital status	Distress levels in two groups		Total (n)
	Low to moderate distress %	High to very high distress %	
Married	80	20	341
Not married	70	30	69

The breakdown of distress levels by gender is shown in Table 5-64.

**Table 5-64 Distress levels by marital status and gender**

Gender	Marital status	Distress levels		Total (n)
		Low to moderate distress %	High to very high distress %	
Male	Married	83	17	180
	Not married	90	11	19
Female	Married	76	24	161
	Not married	62	38	50

Twenty four percent of female respondents were unmarried compared with 10% of males. Thirty eight percent of unmarried females showed high to very high distress levels compared with 24% of married females. Almost 17% of

married males showed high to very high distress compared with only 11% unmarried males. There was, however, no significant association between high distress levels for married and unmarried males ( $\chi^2=0.480$ ,  $p=0.744$ ) and married and unmarried females ( $\chi^2=4.011$ ,  $p=0.067$ ). However if a comparison is made between the proportions of unmarried males with high distress levels (11%) compared with unmarried females (38%), there is a significant association between distress levels and gender ( $\chi^2=4.908$ ,  $p<0.05$ ,  $R=0.267$ ,  $p<0.05$ ). The sample size in this case is only 69 (19 males and 50 females).

In this study, the proportion of married males was higher than that of the Australian general population.<sup>195</sup> There are reports that being married assists with emotional well-being<sup>196</sup> especially if one is male.<sup>144</sup> It would appear therefore, that in this study, emotional well-being of veterinarians is not dependent on marital status. This may, on the other hand, reflect a sample bias in the study.

### 5.6.5 Distress levels and hours worked per week

Mean hours worked per week were determined for all four distress levels. The results are displayed in Table 5-65.

**Table 5-65 Distress scores by hours worked per week**

Distress level score	%	$\bar{X}$ hours worked per week
10-15	46	42
16-21	32	45
22-29	18	47
30-50	5	54
Total	372 (n)	44

Those respondents who worked the longest hours (54 hours per week) were the most distressed, compared with those who worked the lowest number of hours (42 hours per week) who were the least distressed. Since the distribution was asymmetric, the non-parametric Kruskal-Wallis Chi-Square was undertaken which did not show any significance ( $\chi^2=4.085$ ,  $p=0.252$ ). However, using ANOVA, the two collapsed distress levels: *low and moderate* and *high and very high* distress, showed a significant association with working hours ( $F=4.113$ ,  $p<0.05$ ). There was a significant association for hours worked

and distress level for males ( $F=8.568$ ,  $p<0.01$ ) but not for females ( $F=2.151$ ,  $p=0.144$ ).

Combining hours worked per week into three groups: 1 to 20, 21 to 40 and >40 hours and comparing these with the two stress levels for males and females was quite revealing (Table 5-66).

One third of female respondents compared with 20.5% of males working >40 hours per week working were highly distressed. There was, however, no significant association between distress levels and the three working hour groups (<20, 21-40 and >40 hours per week) for the entire cohort.

While females working from 21 to 40 and >40 hours a week appeared to be more stressed than males, there was no significant gender association (females:  $\chi^2=3.897$ ,  $p=0.142$ ; males:  $\chi^2=5.733$ ,  $p=0.057$ .)

**Table 5-66 Distress levels by hours worked by gender**

Gender	Hrs worked per week	Distress levels		Total (n)
		Low to moderate distress %	High to very high distress %	
Male	1-20	100	0	14
	21-40	91	10	42
	>40	80	21	127
Female	1-20	85	15	33
	21-40	70	30	66
	>40	67	33	84

Distress levels tabulated by gender for two categories: working more than, and less than 50 hours a week are presented in Table 5-67. Fifty hours a week was selected because it involved longer working hours than 40 and provided sufficient data in each category for Chi-squared analyses.

**Table 5-67 Distress levels by working <=50 hours a week by gender**

Gender	Hrs worked per week	Distress levels	
		Low to moderate distress %	High to very high distress %
All	< 50	70	58
	≥ 50	30	42
	Total (n)	286	84
Male	< 50	62	33
	≥ 50	38	67
	Total (n)	152	30
Female	< 50	80	72
	≥ 50	20	28
	Total (n)	134	54

Significant associations were established between respondents working more than 50 hours a week and distress levels for the entire cohort ( $\chi^2=4.229$   $p<0.05$ ,  $R=0.107$ ,  $p<0.05$ ) and for males working more than 50 hours ( $\chi^2=8.315$ ,  $p<0.01$ ,  $R=0.214$ ,  $p<0.01$ ), but not for females ( $\chi^2=1.291$ ,  $p=0.254$ ). This gender difference will be discussed in more depth in the following chapter.

The results indicated that some females who worked only a few hours, scored values indicating high distress. However, further investigation is required to establish the validity of this relatively small sample. There were other risk factors that may have impacted on the distress levels of respondents and these results are presented below.

#### 5.6.6 Distress levels and total number of years worked

Low to moderate and high to very high distress levels were compared with years worked as a veterinarian using three categories of <10 years working as a veterinarian, 10-19 years and >19 years working as a veterinarian (Table 5-68).

There were more respondents who had worked fewer than 10 years with high distress levels than respondents who had worked more than 10 years with high distress levels. This was significant ( $\chi^2=8.586$ ,  $p<0.05$ ) for the group as a whole. There were many more females in the high and very high distressed categories (60% compared with 47% of males), however, there was no significant relationship for males ( $\chi^2=1.252$ ,  $p=0.535$ ) or females ( $\chi^2=2.071$ ,  $p=0.355$ ) for working <10 years, 10-19 years and >19 years.

**Table 5-68 Distress levels of respondents by years worked**

Years worked	Distress scores		Total (n)
	Low to moderate (10-21) %	High to very high (22-50) %	
<10 years	73	27	178
11-19 years	77	23	93
>19 years	87	13	118

### 5.6.7 Distress levels and case mix of animals

A comparison was made between the two distress levels of low to moderate and, high to very high, and case mix of animals (Table 5-69).

**Table 5-69 Distress levels by case mix of animals**

Distress levels	Small %	Case mix	
		Large %	Mixed %
Low to moderate	78	84	77
High to very high	22	16	23
Total (n)	205	59	124

Proportionately, the greatest amount of distress was found in those working with mixed animal (23%), followed by small animals (22%) and large animals (15%). There was no association between distress levels and case mix ( $\chi^2=1.560, p=0.458$ ). Nor were gender and hours worked associated with distress levels and case mix.

### 5.6.8 Distress and injury

No significant association between having an occupational injury and distress levels was found ( $\chi^2=0.040, p=0.905$ ) (Table 5-70).

**Table 5-70 Distress levels by injury**

Distress level score	Injury	
	No %	Yes %
Low to moderate distress (10-21)	79	78
High to very high distress (22-50)	11	12
Total (n)	189	223

Distress levels also had no association with the number of injuries incurred (Table 5-71).

**Table 5-71 Distress levels by number of injuries**

Distress levels	Number of injuries (%)				
	0	1	2	3	4
Low to moderate	79	78	81	74	67
High to very high	21	22	19	26	33
Total (n)	189	102	67	51	3



### 5.6.9 Distress and back injury

Distress levels were compared for those respondents who had acquired a back injury in the past 5 years and those who were injury free (Table 5-72).

**Table 5-72 Distress levels by back injury**

Distress level score	Back injury	
	Yes %	No %
Low to moderate distress (10-21)	70	86
High to very high distress (22-50)	30	14
Total (n)	203	196

There was a statistically significant association between the two distress levels of those with a back injury and those without ( $\chi^2=13.527$ ,  $p<0.001$ ).

The association between the two distress levels and *disability due to a back injury* was significant ( $\chi^2=15.562$ ,  $p<0.001$ ) (Table 5-74).

**Table 5-73 Distress levels and disability due to back injury**

Distress level score	Disability due to back injury	
	None %	Yes %
Low to moderate distress (10-21)	80	53
High to very high distress (22-50)	20	47
Total (n)	360	38

### 5.6.10 Distress and substance use.

Substance use by respondents such as alcohol consumption, use of cigarettes and drug taking were presented previously in section 5.2.10. Drug taking in the past 12 months was compared with distress levels (Table 5-74).

**Table 5-74 Drug taking in past 12 months by distress score**

Distress level	Taken drugs in past 12 months	
	No %	Yes %
10-15	51	33
16-21	33	27
22-29	12	33
30-50	4	7
Total (n)	305	107

The association between the four distress levels, drug taking and non-drug taking was highly significant ( $\chi^2=28.399$ ,  $p<0.001$ ). A similar association was found when collapsing the data into the two distress levels of *low to moderate*

**Table 5-75 Distress level by drug taking in past 12 months by gender**

	Psychological distress level	Drug usage	
		No %	Yes %
Male	Low to moderate distress	88	71
	High to very high distress	12	29
	Total (n)	155	45
Female	Low to moderate distress	81	53
	High to very high distress	19	47
	Total (n)	150	62

For males, a significant association was found between drug taking in the previous 12 months and high distress levels ( $\chi^2=7.177$ ,  $p<0.05$ ,  $R=0.189$ ,  $p<0.01$ ). For females the association was even greater ( $\chi^2=17.630$ ,  $p<0.001$ ,  $R=0.288$ ,  $p<0.001$ ).

The association between specific drug usage over the previous 12 months and distress levels are presented (Table 5-76).

**Table 5-76 Use of specific substances by low and high distress levels**

Drug	Distress	Usage in past 12 months %		Significance
		Nil or low	High/medium	
Pain killers	Low distress	84	65	$\chi^2=12.873$ , $p<0.01$ $R=-0.192$ , $p<0.001$
	High distress	16	45	
	Total (n)	284	65	
Tranquillisers	Low distress	84	44	$\chi^2=31.088$ , $p<0.001$ $R=-0.303$ , $p<0.001$
	High distress	16	56	
	Total (n)	305	34	
Marijuana	Low distress	84	73	$\chi^2=1.984$ , $p=0.174$
	High distress	16	27	
	Total (n)	304	26	
Amphetamine	Low distress	84	67	$\chi^2=2.450$ , $p=0.123$
	High distress	16	33	
	Total (n)	310	12	
Antidepressant (non-prescribed and prescribed)	Low distress	81	47	$\chi^2=19.029$ , $p<0.001$ $R=-0.217$ , $p<0.001$
	High distress	19	53	
	Total (n)	375	30	
Cigarettes	Low distress	81	54	$\chi^2=8.605$ , $p<0.05$ $R=0.157$ , $p<0.01$
	High distress	19	46	
	Total (n)	328	22	
Alcohol	Low distress	81	73	$\chi^2=1.150$ , $p=0.284$
	High distress	19	27	
	Total (n)	341	52	

There was no relationship between distress levels and consumption of alcohol for respondents, as a group, or for males and females separately, using the Australian National Drug Strategy categories for *low risk*, *risky* and *high risk* behaviours.<sup>190</sup>

The results indicated that highly distressed respondents were more likely to take drugs. There was a significant association between stress levels and use of pain killers, tranquillisers, antidepressants and cigarette smoking, but no association for marijuana, amphetamine use and alcohol drinking behaviour. Other drug usage was low and it was not possible to obtain reliable statistical information relating drug usage to distress levels. With regard to cigarettes, only 22 (7%) respondents smoked between 1 - 50 cigarettes per day.

Despite there being few smokers, a comparison of the distress levels for the 22 smokers with the 328 non-smokers, indicated there to be sufficient numbers and differences to show a statistically significant association between the two groups (Table 5-76).

The responses to the self-administered questionnaire showed that there were a number of other variables that affected the distress levels of veterinarians. The variables that were linked with distress are presented below.

#### 5.6.11 Distress and anger

The frequencies of becoming angry were collapsed into two groups: often (*several times a week or more*) and rarely (*once a week or less*). It is debatable whether someone who loses his or her temper once a week should be classified as rarely becoming angry. Nevertheless, this classification has been used for the purposes of this analysis. The two distress levels (*low to moderate* and *high to very high*) were tabulated against frequency of becoming angry (Table 5-77).

There was a significant association between high distress and becoming angry often for the cohort ( $\chi^2=36.661$ ,  $p<0.001$ ). The significance was high for both males ( $\chi^2=16.519$ ,  $p<0.001$ ) and females ( $\chi^2=18.189$ ,  $p<0.001$ ).

**Table 5-77 Distress levels and anger frequency**

Distress level	Frequency of becoming angry	
	Rarely %	Often %
Low to moderate distress	87	60
High to very high distress	13	40
Total (n)	277	124

### 5.6.12 Distress and happiness

Distress levels were compared with happiness levels after collapsing the categories to two, *happiness* and *unhappiness* (Table 5-78).

Almost 43% of highly distressed respondents were also unhappy. This was highly significant ( $\chi^2=69.463$ ,  $p<0.001$ ). In other words, those respondents that indicated they were unhappy had significantly higher distress scores than those that indicated they were happy.

**Table 5-78 Distress levels by happiness**

Distress level	Happiness	
	Happy %	Unhappy %
Low to moderate distress (10-21)	85	38
High to very high distress (22-50)	15	62
Total (n)	349	61

### 5.6.13 Distress and job satisfaction

Correlation of high and low distress with satisfaction and dissatisfaction showed that respondents with the highest distress scores also expressed greatest dissatisfaction with 10 aspects on the job satisfaction scale (Table 5-79). The only item showing no significant association with distress was that of *fellow workers*.

Anger and happiness are indicators of emotional health and therefore might be expected to be linked with distress levels. Job satisfaction is not necessarily an emotional health indicator. On the other hand, it could be a predictor of distress.

**Table 5-79 Association of distress and job dissatisfaction**

Job satisfaction feature correlated with high and low distress scores	$\chi^2$	p	Spearman (R)	p
1. Physical work conditions	$\chi^2 = 10.185$	$p < 0.01$	R= -0.163,	$p < 0.001$
2. Freedom to choose own way to work	$\chi^2 = 16.646$	$p < 0.001$	R= -0.210	$p < 0.001$
3. Fellow workers	$\chi^2 = 2.142$	$p = 0.152$		
4. Recognition for good work	$\chi^2 = 13.552$	$p < 0.001$	R= -0.196	$p < 0.001$
5. Immediate boss or partner	$\chi^2 = 7.126$	$p < 0.05$	R= -0.150	$p < 0.01$
6. Amount of responsibilities	$\chi^2 = 11.930$	$p < 0.01$	R= -0.183	$p < 0.01$
7. Income or rate of pay	$\chi^2 = 28.979$	$p < 0.001$	R= -0.281	$p < 0.001$
8. Opportunity to use abilities	$\chi^2 = 10.119$	$p < 0.01$	R= -0.166	$p < 0.01$
9. Industrial relations	$\chi^2 = 13.437$	$p < 0.001$	R= -0.201	$p < 0.001$
10. Chance of promotion / pay increase	$\chi^2 = 16.219$	$p < 0.001$	R= -0.230	$p < 0.001$
11. Out of hours work or being on call	$\chi^2 = 13.519$	$p < 0.001$	R= -0.195	$p < 0.001$

**5.6.14 Distress and zoonoses**

There was no significant association established between distress levels and whether a respondent had a serious zoonosis or not ( $\chi^2 = 0.065$ ,  $p = 0.476$ ) (Table 5-80).

**Table 5-80 Distress levels by serious and non-serious zoonoses**

Distress level	Zoonosis	
	Missing or none serious including ringworm %	Serious or notifiable %
Low to moderate distress	78	80
High to very high distress	22	20
Total (n)	353	59

**5.6.15 Stressors and coping strategies**

Respondents identified major stressors as follows:

- Aggressive, difficult or demanding clients (33%)
- Financial problems (19%)
- Staff difficulties (16%)
- After-hours workload (13%)
- Bosses (5%)
- Concern for patients and having to euthanase animals (3%)
- Lack of perceived self esteem (<1%)
- Time management (<1%)
- Bureaucracy (<1%)

Coping mechanisms for stress were identified by respondents and are listed in Table 5-81.

**Table 5-81 Coping strategy for stressors**

Coping strategy	Frequency of use %
Partner/family/peer support	49
Do nothing	11
Exercise/sport	11
Alcohol	6
Prayer/religion	4
Music	4
Meditation	4
Cigarettes	3
Financial advice/management	3
Drugs	2
Medication	1

Use of partner/family and peer support was by far the most frequent strategy respondents used for coping with stress with nearly 50% of respondents indicating that this was their preferred strategy. Other strategies included doing nothing (11%), sport or exercise (11%) followed by alcohol, prayer, music, meditation and cigarettes. Use of drugs and medication were the lowest ranked with only 3% of respondents nominating these.

The Veterinary Surgeons Board survey of stress (Appendix A) showed that family and friends were used for support by 93% of veterinarians, workmates by 23%, other veterinarians by 67%, employers by 50% and doctors by 30%. The frequencies of use of these were similar for females and males. The study did not include "self" or "do nothing" among its categories.

In the current study, it was not possible to determine the significance of individual stressors and coping strategies because respondents were able to list several stressors and coping strategies without indicating which were the most important.

In the study of Finnish veterinarians,<sup>16</sup> work was cited as the most significant cause of stress, specifically "being pressed for time, having too much work to do and not having a clear overview of the work itself." Being on-call after-hours, administrative work and uncertainty of continuation of the work

contract were all contributing factors to stress. The researchers suggested that older veterinarians might have developed better coping strategies for stress.

#### 5.6.16 Logistic regression

A stepwise logistic regression was undertaken to determine predictors of distress in respondents.

The independent variables entered into the logistic regression model included those variables that had showed a statistically significant relationship with distress scores using Chi-squared analyses. These included: age group, gender, ownership of veterinary practice, case mix of animals serviced, whether respondents had a back injury and drug taking over the past 12 months. Initial analysis using logistic regression deleted too many cases because of non-responses. The regression analysis was repeated to take account of these missing values using Multiple Imputation for Missing Data developed by SAS and the MIANALYZE program. While the new model did not change the factors or their significance in affecting distress, it strengthened the estimates and confidence intervals. These new estimates and confidence intervals are presented in Table 5-82. Having had a previous back injury and being a female associate were initially identified as predictors for high distress levels. Variables that showed no significance were: case mix of animals, having had an occupational injury and hours worked.

**Table 5-82 Odds ratio for predictors of risk factors for distress**

Variable	Significance	Estimate	95% Confidence Limits Lower bound	Upper bound
Back injury compared with no back injury	p<0.001	2.50	1.50	4.18
Female associate compared with male owners	p<0.05	1.90	1.03	3.49

When two additional variables: age group and drug taking during the last 12 months, were added to the model, back injury remained statistically significant but being a female associates was not. This latter variable was eliminated from the model. Two job satisfaction factors, *freedom to do own work* and *level of income* were also significant in the original model. While jobs can

affect stress levels and therefore job satisfaction could impact on stress, it may also be a response to stress and hence the final model did not include these items.

The final model showing the odds ratios for the significant variables is presented in Table 5-83.

**Table 5-83 Odds ratio for additional variables affecting distress**

Variable	Significance	Estimate	95% Confidence Limits	
			Lower bound	Upper bound
Back injury	p<0.01	2.32	1.38	3.90
Age group (<35 years)	p<0.05	3.58	1.24	10.32
Taking drugs in last 12 months	p<0.001	3.15	1.88	5.25

There were, therefore, only three variables of any significance for predicting distress and these were: *having had a back injury in the previous five years, having taken drugs in the past 12 months and being less than 35 years of age*. It is possible that drug taking in the past 12 months may also be a manifestation of stress. The analyses were repeated for practitioners only and the results were similar for the full data set with slightly changed odds ratios. Tables of the various models used in the logistic regression analyses are contained in Appendix I.

#### 5.6.17 Summary of variables affecting distress

In summary, variables found to be significantly associated with distress when individual Chi-squared analyses were undertaken were: gender, hours worked, risk taking when first graduated, having had a back injury over the past five years, drug taking over the previous 12 months together with several specific drugs. Marital status was not related to distress levels. Anger and unhappiness were significantly related to high distress, however, they are more likely manifestations of distress and not necessarily causes of distress. Job satisfaction items were significantly associated with distress levels however some of these may also be a response to stress, as was frequency to become angry, and unhappiness. The effect of after-hours work on ability to sleep, energy levels and family life were significantly associated with distress levels of respondents, suggesting that unpredictability of working hours may be a major determinant of the effects of these.



Logistic regression modelling enabled the calculation of the independent effect of each variable model after adjusting for all other variables and showed that, having had a back injury in the previous five years, having taken drugs in the past 12 months and being <35 years were significant predictors of high distress levels in respondents. Being a female associate appeared initially to be a major determinant of distress, however, logistic regression showed that distress levels of females, especially associates, were more a function of age than gender.

## 5.7 PHASE 4: DETERMINATION OF CAUSES OF DEATH

This phase of the study reviewed causes of death of veterinarians in both Victoria and Western Australia and specifically investigated suicide. The Coroner's Offices in Victoria and Western Australia provided data about these deaths.

### 5.7.1 Causes of death of veterinarians

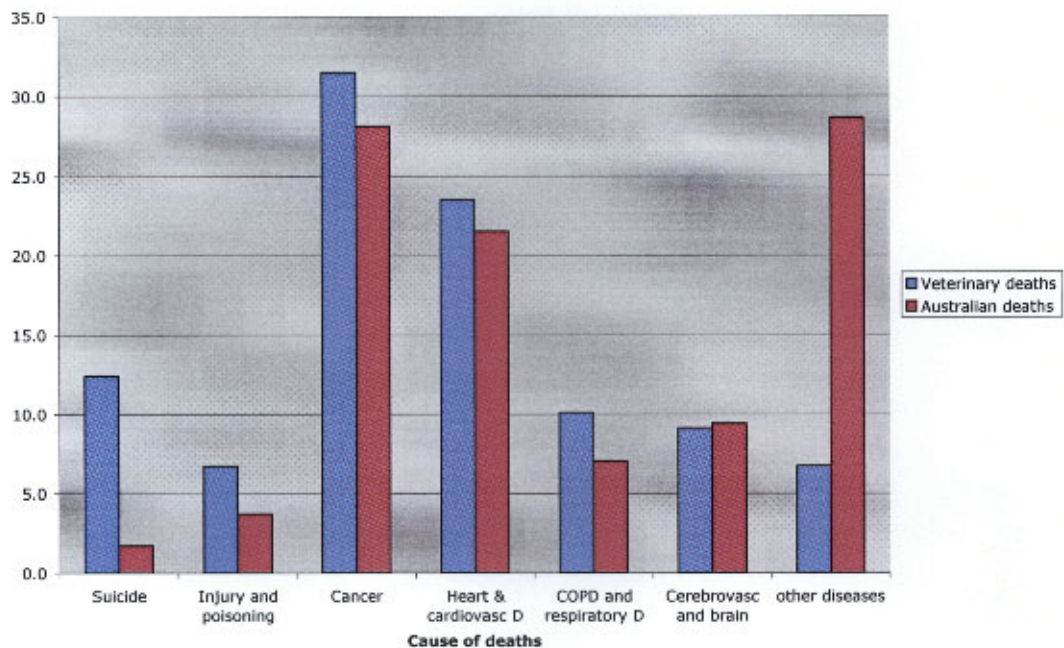
A summary of the causes of deaths of all veterinarians for WA and Victoria by age group and occurring between 1990 and 2002 is presented in Table 5-84. Suicides included drug related or undetermined cases as specified by the Coroner. Drug toxicities listed specifically as accidental were excluded from any calculations of suicide.

**Table 5-84 Causes of death & mean age at death**

Cause of death	#	%	Mean age at death (yrs)
Cancer	28	32	65
Ischaemic heart disease	19	21	74
Respiratory disease	9	10	73
Suicide due to drugs	9	10	37
Suicide other cause	2	2	50
Brain disease	4	5	83
Stroke	4	5	85
Drug toxicity accident	2	2	26
Cardiovascular disease	2	2	75
Asphyxia accident	2	2	36
Septicaemia	2	2	57
Accidental physical injury	2	2	23
Miscellaneous	4	5	57
Total	n=89	100	63

Deaths of veterinarians from the various causes were compared with the percentage of deaths from available data on Australian and Western Australian populations. Causes of death as a percentage of total deaths compared with national population figures for males and females are shown in Figure 5-7.

**Figure 5-7 Comparison of causes of death of veterinarians with the Australian population**



Deaths of veterinarians derived from WA and Vic death registers in Phase 4. Australian figures derived from Australian Bureau of Statistics<sup>197</sup>

Data for some diseases that were recorded for veterinarians were not noted in the WA or national figures. For example, septicaemia was not present. Respiratory diseases were combined with Chronic Obstructive Pulmonary Disease (COPD). Some of the categorisation was subjective because it is difficult to know the actual cause of death without going back to the primary source of information. It was impossible to differentiate ischaemic heart disease and cardiovascular diseases as causes of death from the Registrar's records and these have been combined to produce a single category for heart disease. The numbers of deaths for veterinarians dying between 1989 and 2002 was 89, comprising 76 males and 13 females.

The proportion of veterinarians dying from injuries, toxicities, heart and respiratory disease appeared higher in the Phase 4 results than in the general population, however, no conclusions could be drawn because of the uncertainty that all cases of deceased veterinarians have been accounted for. Some veterinarians may have retired and not had their profession listed in the Death Register.

Deaths in veterinarians due to suicide are discussed.

#### *5.7.1.1 Suicide*

Of the 13 (15%) female veterinarians there were two suicides. As numbers were low, it was not possible to compare these figures with national statistics for female deaths. It should be pointed out that an increase or decrease of just one or two suicides would make a great difference to the rate.

Of the total of 11 suicides (9 males and 2 female) nine occurred in rural or provincial towns and two in the city. There appeared to be a significant difference between rural and city for place of death however, the numbers in city areas were too few for reliable statistical evaluation. The majority of suicides of males in the general population occur in rural areas and the majority of female suicides occur in the city.<sup>164</sup> Suicide of male veterinarians was highest in rural areas, which is similar to what occurs in the general population. Since there were only two female veterinarian suicides, one in the country and one in the city, no conclusions could be drawn about place of death for female veterinarians.

The average age for veterinarians from Western Australia and Victoria committing suicide was 37 years and 44 years respectively. The average age of male veterinarians for Victoria and Western Australia was 44 years and for the two females, it was 28 years.

The actual means whereby veterinarians committed suicide are listed in Table 5-85 along with age at death, year of death and where the suicide occurred.

**Table 5-85 Method of suicide of WA and Vic veterinarians**

Gender	Year	Age at death	WA/ Vic	City Rural	Cause of death
Male	1992	35	WA	City	Cyanide toxicity
Male	1991	48	WA	Rural	Injection of toxic substance
Male	1998	27	Vic	Rural	Drug toxicity
Male	1990	40	Vic	Rural	Drug toxicity
Male	1995	50	Vic	Rural	Acute intoxication, likely self inflicted
Female	1999	28	WA	City	Pentobarbitone self injected
Female	1998	28	Vic	Rural	Drug toxicity
Male	1998	36	WA	Rural	Hanging
Male	1993	47	Vic	Rural	Toxic effects of drugs
Male	1999	52	Vic	Rural	Drug toxicity
Male	1996	63	Vic	Rural	Gunshot wound to the head

While not directly related to suicide in veterinarians, it seems relevant to report that there were three “suspicious” deaths among veterinary nurses and assistants. Information on these is presented to show that veterinary support staff is also at risk (Table 5-86).

**Table 5-86 Method of suicide of WA and Vic support staff**

Gender	Year	Age at death	WA/ Vic	Rural/ City	Cause of death
Female	1990	20	Vic	City	Drug toxicity
Female	1993	37	Vic	Rural	CO Poisoning
Female	1996	20	WA	Rural	Halothane toxicity (open finding)

While the rate of suicide for veterinary nurses and technicians is unknown, the analysis of Victorian and Western Australian “vet” records showed that several auxiliary staff had also committed suicide. These deaths should be a cause for concern for the veterinary profession because veterinary staff have access to the same lethal drugs, as do qualified veterinarians.

Age-standardised and age-specific rates (ASR) were calculated for veterinarian data for both Western Australia and Victoria using the Rates Calculator developed by Codde.<sup>1</sup>

With the assistance of Dr David Lawrence,<sup>ll</sup> it was possible to determine the following age-standardised rates (ASR) of suicide for veterinarians per 100,000:

Western Australia:	ASR of 52.6 per 100,000 (95% CI: 19.7- 140.1)
Victoria	ASR of 41.8 per 100,000 (95% CI: 19.9 - 87.7)
Combined rate	ASR of 45.2 per 100,000 (95% CI: 25.0 - 81.6)

The ASR for suicide in Australia for 2003 was 11.1 deaths per 100,000 population and for the period 1999-2003, was 12.2.<sup>165</sup> The rate for the general WA population 1999-2003 was 13.0 and for Victoria, it was 11.1.<sup>165</sup> The suicide data for veterinarians was obtained over a 13-year period (1990-2002), however, as shown in the literature (Figure 2-5), the suicide rate in the general population has not increased very much over that time period.

Hence the suicide rate determined in this study for Western Australian veterinarians is approximately four times the state population rate. For Victorian veterinarians, the suicide rate is approximately 3.8 times the state population rate. Lawrence has cautioned that suicide deaths could be as much a result of factors unique to the individual cases as the profession as a whole.<sup>mm</sup>

Overseas, veterinarians have also been shown to have significantly higher suicide rates compared with the general population even as far back as 1977 and to the present time.<sup>24, 25, 42, 45, 171</sup> In the UK, farmers, pharmacists, dentists and physicians had double the expected suicide rate of the general population while veterinarians had three times the Proportionate Mortality Rate (PMR).<sup>52, 53</sup> It appears that a similar situation applies in Australia although it is difficult to find other professional groups with which to compare the UK figures. It is generally accepted that dentists and doctors have very high rates of suicide and while this may have been the case once,<sup>163</sup> this has not been shown in recent times. There is nothing published about suicide rates in these professions and contact with both the professional and registering bodies for dentists<sup>nn</sup> and doctors<sup>oo</sup> in Western Australia, showed that they were uncertain of the rates for suicide for their professions.

Charlton<sup>52</sup> in the UK indicated that people kill themselves for several reasons including access to the means, stressful life events, personal factors including level of social support, illness both mental and physical and, changes in the wider cultural climate including cultural attitudes and economic climate. Many of these situations apply to veterinarians and may provide the overall reasons why suicide in veterinarians in Australia is high.

The major methods of suicide in the general population,<sup>166</sup> were hanging and strangulation (25% of deaths), firearms and explosives (23%), carbon monoxide (19%) followed by poisonings (18%). This latter figure has been declining since restrictions were placed on availability of drugs. In Western Australia,<sup>164</sup> the most common methods for suicide in males were carbon monoxide, followed by hanging and firearms whereas in females, overdose of drugs, followed by carbon monoxide and hanging. The major method used by veterinarians was drug overdose, mainly by injectable barbiturates. This is no doubt attributable to easy access to these drugs.

The data output and analyses from Phase 4 are interesting because they show that while veterinarians have similar rates of death for cancers, heart and cardiovascular disease and strokes to the general population, they have apparently much higher rates of death due to injury, poisoning, and suicide. One must caution here that coroners' records may not indicate the profession of an individual if they were retired at the time of death. These records, therefore, will be an underestimation of the number of veterinarians who have died, and their cause of death. The other cautionary comment is that because there are such small numbers of veterinarians' deaths, one or two deaths more or less, would change the statistics dramatically.

Except for the cases of suicide, there were very few fatal work injuries reported among Australian veterinarians. Recently, a government-employed veterinarian was killed in a commercial plane accident but such incidents are rare.

## 5.8 SUMMARY

Phase 2 used data linkage outputs obtained by linking Western Australian veterinarians' names with four databases maintained by the HDWA. Statistics on occupational injury and disease resulting from the analyses of this output were presented, however the results from this analysis were disappointing. As a consequence, a survey of Western Australian veterinarians was carried out in Phase 3 to determine occupational injuries and risk factors for this group.

Analysis of data from the self-reported questionnaire for *injuries* using Chi-square revealed that a high proportion of respondents experienced occupational injuries that were related to a number of risk factors. Using stepwise logistic regression, determined only three predictors for *injury* which were: back injury, taking drugs in the previous 12 months and being 33-54 years old. Being in mixed animal practice was of borderline significance.

Psychological *distress* of respondents was assessed for Phase 3 respondents using the standardised Kessler 10 scale and this showed that respondents experienced high distress at more than twice the level found in the general population. Using stepwise logistic regression, three predictors for *distress* were found which were, having had a back injury, taking drugs in the previous 12 months and being less than 35 years of age. Being female was initially identified from a Chi-squared analysis, as being significantly associated with distress however this factor was subsequently eliminated from the logistic regression model. There were other variables that were linked with distress using Chi-squared analyses, however, these were also eliminated as predictors or were not included in the calculations for logistic regression.

Coroner's records from Victoria and Western Australia were analysed and these showed that suicide among veterinarians in both states is about four times the national rate for suicide.

The next chapter provides a discussion of the major results from the study drawing together the findings from all four phases of the study.

## CHAPTER SIX

### 6 DISCUSSION AND RECOMMENDATIONS

#### 6.1 INTRODUCTION

To obtain a better understanding of occupational health among veterinarians, this study looked at several aspects of occupational injury and disease among veterinarians using both qualitative and quantitative methodologies.

Risk factors for injury, disease and stress were identified from three different methods of data. The risk factors determined from the in-depth interviews were not always confirmed by findings from the self-administered questionnaire.

Several variables were identified as being significantly associated with injury, disease and stress by analysing data gathered from the survey using Chi-squared analyses. It is recognised that the power of the Chi-squared test is low especially when several variables are involved and the sample size is small (419 respondents). Logistic regression analysis, therefore, was used to determine significant predictors for injury and distress in order to maximise the statistical power of the test.

The narrative accounts that emerged from the in-depth interviews about the difficulties encountered in everyday practice including issues of emotional health, stress and thoughts about suicide, were as valuable as the statistical results presented *vis à vis*. Interestingly enough, this form of analysis minimised the unnecessary dichotomy that is often attributed to quantitative and qualitative research paradigms. The anecdotal accounts provided highly valuable and insightful information about the behaviours, attitudes and belief systems held by working veterinarians. Interviews have also proved useful for filling in information gaps that result from the use of questionnaires.

The sample interviewed was slightly older and more likely to be male practice owners compared with those surveyed, where there were almost equal numbers of males and females and a high proportion of



associates. Overall, the study sample was similar to that found with studies undertaken on Australian veterinarians for gender, type of employment and case mix. The results obtained from this study are of relevance to the wider Australian population of veterinarians.

Discussion of some results occurred in the previous chapter where a comment or comparison about the findings was relevant. This chapter, on the other hand, contains discussion only of the major findings, of the research. The discussion will be presented under headings for occupational injury, zoonoses, emotional health and suicide and draws together the findings from the four different methods of research undertaken during this study. Some segments of the discussion are designed to highlight valuable details of the context in which veterinarians work, which could be valuable for future research and useful to health policy makers. Other segments of the discussion, however, are followed by specific recommendations that will hopefully, be implemented as recommended.

## 6.2 INJURIES

The study population comprised subjects from the in-depth interviews and respondents to the self-administered questionnaire. Both samples experienced a high number of a diverse range of injuries and comparisons generally showed these to be similar to what had been reported in other studies.

When quantifying the number and rate of injuries, there needs to be a standardised definition of the word "injury" for determining the severity of these, in order to make comparisons more meaningful. As demonstrated in the literature review, most studies do not define injury, making it difficult to compare studies. Even the use of a comprehensive definition may not overcome the omission of serious injuries by subjects because of memory lapses and because some veterinarians continued working, even after incurring horrendous injuries.

### **Recommendation 1**

*There needs to be a standardised definition of injury to ensure that all serious injuries are reported, especially for veterinarians who often continue to work despite having severe injuries. It is proposed that the definition used be that used by Gerberich et al.<sup>79</sup>*

#### **6.2.1 Types of injuries**

In this study, bites and scratches from dogs and cats, lacerations and fractures were the most common injuries sustained by veterinarians, followed by back injuries. Generally dog and cat bites were not life threatening, although, two veterinarians interviewed received ruptured arteries from dog bites and required urgent medical treatment.

Most bites were attributed to being in a hurry, inattention, not having a competent person restrain the animal or assuming a dog would not bite and therefore, failing to muzzle it. In some cases, owners knew that their dog had the propensity to bite, but failed to warn the veterinarian.

Cattle and horses caused by far the most serious injuries. Such injuries included fractured ribs, broken arms, legs, knees and dislocated shoulders and elbows, fractured skulls, broken jaws, being knocked unconscious, and ruptured spleens. Some of these occurred as a result of a lack of concentration on the part of the veterinarian, the unpredictable behaviour of the animal and from poor facilities. Most of these injuries required immediate medical attention. As stated earlier, some veterinarians completed the task they were undertaking in spite of severe injuries such as having broken or dislocated elbows or having calving hooks go through their hands. The results reflected the dedication with which veterinarians undertook their work.

The study confirmed that many veterinarians undertook inappropriate lifting, especially of heavy animals such as large dogs or when delivering calves or foals, which resulted in back injury.

There is evidence in the literature that injury to backs could be due to poor posture when driving<sup>16</sup> and therefore, in this study it was expected that veterinarians working with large animals who drove longer

distances would have the greatest number of back injuries. Even though small, large and mixed animal veterinarians all experienced back injuries, it was mixed animal veterinarians who experienced significantly more back injuries. These veterinarians drove large distances between farm calls and the clinic and, while they may have had poor posture when driving, there was no evidence in this study that this was the cause of back injury.

Risk-taking when first graduated, and at the time of the survey, was significantly associated with back injury. While it is possible that changing risk-taking behaviour could be a major way of reducing such injuries, more research needs to be undertaken on back injuries and their risk factors, before concluding that this will happen.

The high proportion of this study sample with back injuries that occurred across the age spectrum is cause for concern.

#### **Recommendation 2**

*Future investigations of injury in the workplace, including back injury in veterinarians, should incorporate questions on the amount of travel veterinarians undertake as part of their work. These studies should also consider objective assessment of correct driving position.*

Chronic injuries in veterinarians as a result of repetitive activities were quite high. Some veterinarians were able to pregnancy test hundreds of cattle a day per-rectum with few consequences while others believed that the arthritis in their elbows, shoulders and knees was due to pregnancy testing large numbers of cattle. Several were forced to limit the number of pregnancy tests they undertook and some had to cease working as large animal veterinarians because of their injuries. Some veterinarians indicated they had reduced their risk from these injuries by routinely using ultrasound for pregnancy testing and only undertaking the per-rectum procedure for difficult cases such as large and overweight cows.

### **Recommendation 3**

*Veterinarians prone to developing chronic joint problems from pregnancy testing large numbers of cattle, might need to limit the number of pregnancy tests they undertake daily, or invest in ultrasonic pregnancy testing equipment. The latter equipment is relatively expensive however in the long term, it may protect the veterinarian from chronic damage to joints.*

#### **6.2.2 Risk factors for injuries**

The narrative accounts revealed that long and unpredictable working hours, working in mixed animal practice, poor facilities on farms, and inattention on the part of farmer clients in failing to restrain their animals adequately, were major contributors to injuries.

On the other hand, Chi-squared analyses of data obtained from the questionnaire, showed that being a practice owner, working in mixed animal practice, taking risks when first graduated, drug taking in the previous 12 months and back pain, were all associated with injury.

Logistic regression, which is statistically more powerful than Chi-squared analyses, showed just three predictors of injury and these were:

- being 35-54 years of age
- having had a back injury
- taking drugs in the previous 12 months

The discussion of risk factors includes those derived from the interviews and those determined from analyses of the self-administered questionnaire. The major risk factors are discussed in more detail in the following subsections.

##### **6.2.2.1 Demographic and work related risk factors**

Long working hours and an expectation of being injured, were risk factors identified from the narrative accounts, but the Chi-squared

analyses of the questionnaire did not confirm that long working hours contributed to injury.

Mixed animal veterinarians were more frequently injured than either small or large animal respondents and this was confirmed both in the interviews and in the findings from the survey. Mixed animal practitioners who had graduated for only a short time had similar injury rates to those working longer times. Surprisingly, however, it was those in the 35-54 year group who had the greatest number of injuries. Most of those injured were male practice owners, however, gender was not significantly associated with injury. There were very few female practice owners. Interestingly, risk taking when first graduated was associated with occupational injuries, especially for mixed animal veterinarians and was similar for both older and younger graduates. A possible explanation for these results is that veterinarians took risks when first graduated because of inexperience and possibly naïve expectations about their abilities, which at that stage were largely untested.

It was identified in the narrative accounts that having a back injury may have contributed to other occupational injuries. This was confirmed from the self-administered questionnaire using Chi-squared and logistic regression analyses. Risk taking when the survey instrument was administered, was associated with back injury, but not with general occupational injuries for mixed animal veterinarians, which suggests that experience may have taught a high proportion of veterinarians to avoid some unnecessary risks.

#### *6.2.2.2 Facilities*

A lack of, or substandard facilities was considered by those interviewed working with cattle and horses to be a significant problem contributing to their injuries. Several subjects stated they had to tie cows to their vehicles for restraint especially when delivering calves or undertaking caesarean sections in open paddocks. These environments obviously created a major risk factor for injury as was working in cattle races where subjects were also vulnerable to being injured when delivering calves or undertaking pregnancy testing. When a cow was inadvertently sent down the race, there was generally no escape route

for the veterinarian unless the yards had been purpose-built with escape gaps in the sides. When working in a race, having a gate or barrier behind the veterinarian generally prevented injury from animals charging from behind. Sadly, many facilities did not have such protection and veterinarians continued to be at major risk from being injured.

Many veterinarians placed a bar behind an animal in a race to prevent it moving backwards or kicking, however these bars were not necessarily protective. One veterinarian was severely injured when a horse kicked backwards and he was hit in the chest and abdomen by both the horse's hoof and the bar. Furthermore, it was not unusual for a cow to collapse to its knees or become recumbent while the veterinarian had an arm inside the cow's vagina or rectum. The bar behind the cow, which provided protection from kicks, sometimes hindered the veterinarian from removing the arm quickly enough. The consequences were hyperextension of the elbow and/or fractures. The research demonstrated that undertaking pregnancy testing or delivering a calf in a rotary dairy was a major hazard because of the bar height behind the cow. Although this appeared to be a lesser problem in herringbone dairies and in most cattle races, veterinarians needed to take precautions in these settings.

Large-scale pregnancy testing of cattle was generally undertaken in cattle races, some of which were curved slightly. This configuration generally worked in the veterinarian's favour, if for example, the right arm was being used for pregnancy testing. If the left arm were being used, the curve of the race contributed to increased pressure on the veterinarian's elbow or shoulder joint because of the wrong angle. This situation, together with the cow's movement, put enormous pressure on the elbow and shoulder, which on rare occasions caused hyperextension of the elbow or, led to chronic elbow and shoulder injuries.

Working in open cattle yards also proved hazardous. Subjects described how they were expected to walk among cattle to carry out procedures such as vaccinations or even deliver calves. Being in a large yard or

paddock allowed a cow or bull to build up speed when charging with little room for escape by the veterinarian.

Veterinarians continued to be exposed to unnecessary, and preventable risks, by working in unsuitable facilities. On the other hand, many subjects stated that they generally felt sorry for farmers because of cost considerations and did not want to add to farmers' woes by demanding improved facilities. Some veterinarians have invested in mobile restraint cradles, which they use when facilities are inadequate.

#### **Recommendation 4**

*Veterinarians should help design facilities that will enable them to safely undertake procedures and minimise the risk of injuring themselves. An alternative is for veterinarians to carry their own restraining devices to be used when facilities are substandard or absent.*

#### **6.2.2.3 Animal restraint**

The research highlighted another interesting aspect of veterinarian exposure to risks, which was associated with unpredictable and unmanageable animal behaviours especially when working with horses. Veterinarians were frequently expected to break the animals in before undertaking procedures either through the use of drugs or to become instant "horse whisperers". The research showed that veterinarians castrated unbroken colts, knowing that this was a highly dangerous practice. There is however, hope that some changes may be occurring, as several subjects indicated they were not prepared to allow new graduates to face the same risks as themselves. Owners were informed that the veterinary practices would no longer castrate horses until they had been broken in and could be readily handled by the veterinarian.

#### **6.2.3 Reducing risks**

The issues associated with the reduction, if not elimination, of injuries are complex and wide-ranging. The findings from this research indicated that strategies should include: a review of the settings; training of farmers and support staff; implementation of appropriate

infrastructures, both in veterinary practices and in the field; a review of the actual training of veterinarians; clarity when seeking information about animal behaviour from owners; and the setting up and reviewing of safety policies in the veterinary practice. Adding to these complexities is the ultimate issue of finance, which, as indicated by potential solutions to reduce risks, appears to be a major determining factor for injury. Hence the challenge will be to juggle a reduction in risk factors in a way that any changes are practicable and affordable. Recommendations must be realistic because the problems are often dictated by costs as well as the environmental settings.

Furthermore, as demonstrated in this study, there needs to be cognisance of specific risk factors associated with horses and cattle because of their size and unpredictable nature. This finding indicated that on occasions, it was the client's inability to restrain animals and inattention that contributed to veterinarians being injured by animals they were treating.

#### **Recommendation 5**

*Veterinarians should always employ competent animal handlers to restrain animals. If veterinary technicians or nurses are not available, clients, including farmers, should be trained to be competent at holding animals correctly by agricultural colleges and veterinarians.*

The responses to the self-administered questionnaire suggested that unnecessary risk taking was frequently attributed to costs associated with having adequate facilities and support staff. Where extra staff had been employed to handle and restrain animals and with better time management to undertake veterinary procedures, there had been a reduction in the number of injuries for some small animal veterinarians. Unfortunately, this is not an option for many small animal clinics and for most rural veterinary practices that are already understaffed, where veterinarians receive less income than their city counterparts.<sup>55, 64, 198</sup>

An important revelation from the in-depth interviews demonstrated that many veterinarians, especially those who were older, tended to have a blasé attitude to being injured and regularly appeared to put themselves



at risk. As highlighted in previous chapters, this attitude is a serious problem that requires both the educational institutions and the veterinary profession, to work collaboratively with the delivery of programs specifically designed for young veterinarians. The extent of attitudinal problems has also been recognised by insurance companies who have indicated that they are only seeing *the tip of the iceberg*, with injury and illness occurring far more frequently than is reported.<sup>PP</sup>

#### **Recommendation 6**

*The veterinary profession along with veterinary schools should consider supporting programs designed to change the culture that prevails among veterinarians, placing greater emphasis on prevention of injuries, especially back injuries.*

WorkSafe WA recently commenced occupational health and safety inspections in veterinary practices in Western Australia.<sup>99</sup> Reports so far indicate that WorkSafe has concentrated on safety of drugs and chemicals where it is possible to be prescriptive about how these compounds are maintained. What was not reviewed, were the major risk factors for injury and disease among veterinarians and their staff. It is unlikely that these inspections will influence or change the culture with regard to issues of safety in veterinary practices. Nevertheless, it is a start to solving a complex issue.

#### **6.2.4 Treatment of injuries**

Contrary to the results from a US study,<sup>13</sup> most veterinarians in this study sought treatment from doctors for serious injuries and diseases, but self-treated when they sustained minor injuries. As indicated earlier, some veterinarians delayed obtaining professional treatment for extremely serious injuries and completed their tasks before seeking medical attention. While this may show stoicism and a dedication to the animals they treated, such actions are imprudent and may result in serious consequences.

### 6.2.5 Inconsistencies in results

There were some inconsistencies in the results obtained using different methods of data gathering and analyses.

a. The anecdotal data from the narrative accounts indicated that working with large animals; poor facilities; inattention on the part of clients, and long or unpredictable working hours were major risk factors for injury.

b. Chi-squared statistical analyses supports the notion that working in mixed animal practice, being an owner of a practice, taking risks when first graduated, drug taking in the previous 12 months and back pain were significantly associated with being injured.

c. Logistic regression on the other hand, showed only three risk factors being significant predictors of injury, and these were: having a back injury; being between 35-54 years; and drug taking in the previous 12 months. What was surprising was that stress, despite being mentioned in the narrative accounts as a risk factor for injury, was not found to be a risk factor when Chi-squared and logistic regression analyses were employed.

#### **Recommendation 7**

*Further research with a larger sample population should be undertaken and this may produce more consistent results.*

### 6.3 OCCUPATIONAL ZONOSSES

It was revealed in both the in-depth interviews and survey samples that veterinarians incurred a wide range of zoonotic diseases, some of which were serious.

#### 6.3.1 Types of zoonoses

A third of the study population incurred a zoonotic disease. These diseases were mainly ringworm and were generally regarded by veterinarians as being quite trivial. The incidence of serious zoonotic

diseases in the study was higher than that found in a previous Western Australian survey more than ten years earlier where only 4% of veterinarians acknowledged that they had incurred a zoonotic disease. The possible higher incidence of zoonotic diseases in veterinarians in this study requires further investigation.

#### **Recommendation 8**

*Future studies on occupational injury should include a more comprehensive investigation of the incidence of zoonoses among veterinarians.*

#### **6.3.2 Risk factors for zoonoses**

It is of concern that some veterinarians, while aware of the signs and symptoms of the major zoonoses, often failed to consider that they might have developed such a disease. A major risk factor identified for obtaining zoonoses was the desire to save the life of newly born animals using mouth-to-mouth resuscitation, especially if these animals were the result of expensive embryo transfer techniques.

#### **Recommendation 9**

*Veterinarians should avoid mouth-to-mouth resuscitation of newborn animals at all times and have emergency equipment available for resuscitation of animals.*

There is always an increased risk for veterinarians of developing a zoonotic disease because of difficulties in diagnosing these diseases in animals. Very few zoonotic diseases can be prevented by vaccination of humans, however, in Australia, Q fever is an exception.

#### **Recommendation 10**

*All veterinarians and veterinary students working with large animals should be vaccinated against Q fever.*

The investigation of emotional health was a central aspect of this study. As such, it was investigated comprehensively with two population samples: through in-depth interviews with 45 veterinarians and, using a self-administered questionnaire from 419 veterinarians. Subjects' perception of their stress, anxiety and depression were gathered in the interviews. The objective assessment of distress was undertaken using the K10+ scale in the self-administered questionnaire. In addition to the measure of distress, other indicators of emotional well-being included were happiness, job satisfaction, frequency of being angry, effect of after-hours calls on family life, energy levels and ability to sleep.

One of the most significant outcomes of this study was that a high proportion of veterinary subjects interviewed appeared to be stressed and a similar proportion of respondents showed psychological distress. Factors that possibly contributed to their stress and distress are discussed.

#### **6.4.1 Possible risk factors for stress and distress**

##### **6.4.1.1 *Gender, age, marital status and hours worked***

The findings from the in-depth interviews indicated that working long hours and being on-call after-hours, were major factors for stress, however, it was the unpredictability of out-of-hours work that caused subjects the most stress. Those with failed marriages indicated that they believed their marriage breakdown was due largely, to the long and unpredictable hours they had worked.

Despite complaints that unpredictability of after-hours work as well as long working hours hindered social life and the ability to develop relationships, the marriage rate of respondents was much higher than that of the Australian general population.<sup>196</sup> Several subjects indicated that they had changed their work practices, reduced their working hours and limited their out-of-hours work. They reported that these strategies had reduced their stress and enabled them to spend more time with their families.

Data obtained from the self-administered questionnaire collated from the Kessler 10+ survey showed that there was more than double the proportion of highly distressed veterinarians in this study compared with the general Australian population. These findings support those from the Veterinary Surgeons' Board of WA survey (Appendix A) and Heath<sup>200</sup> where one-third of veterinarians were highly stressed on a regular basis.

In this study, the greatest proportion of respondents with high distress levels was found in female veterinarians younger than 35 years of age but a high proportion of males in the 45-54 year group, also had high distress levels. Practitioners were significantly more distressed than non-practitioners who were mostly government veterinarians.

When investigating the impact of marital status, the study showed that unmarried females were significantly more associated with high distress levels than unmarried males, and married male veterinarians had higher distress levels than unmarried males. It was, however, unmarried females who showed the highest distress levels. There was no significant association between gender, marital status and high distress levels within the entire cohort.

An interesting finding was that distress levels appeared to be gender related, at least initially when Chi-squared analyses were undertaken. There was proportionately nearly double the number of females with high and very high distress compared with males. One could speculate that social factors may contribute to this apparent 'emotional vulnerability' such as those found within the home environment where, in general, women tend to take on more responsibilities than men, especially with regard to child care and home management.

As reported later, differences in distress levels between males and females, when logistic regression was used, were more a function of age rather than gender.

#### **6.4.1.2 Practice ownership, case mix and rural practice**

As found in other studies undertaken in Australia,<sup>46, 66</sup> there were very few females owning veterinary practices alone or in partnership, and in

this study, no significant gender association between distress levels and practice ownership was established. A dearth of younger people wanting to join existing practices as partners has placed considerable pressures on older veterinarians seeking to share practice overheads and reduce their workload and stress. The results of this study indicate that fewer veterinarians, male or female, were working in rural areas as owners or associates. This is of concern not only from an animal health aspect, but also because it places added stress on those veterinarians already working in rural areas. The findings indicate that some new graduates do not want the stress of owning a veterinary practice, especially in rural areas.

In this study, some veterinarians indicated they left rural practice partly because they resented having to work much harder than other professionals and earned substantially less income. As previously discussed, mixed animal practitioners had the highest injury rate, but their distress levels were not significantly different from those of other practitioners.

The findings from the present study support those of the 2003 Frawley Review of Rural Veterinary Services in Australia<sup>201</sup> which received more than 50 submissions from rural veterinarians. All commented on the demanding nature of their work and the limitations in lifestyle when compared with city counterparts. The areas emphasised in the submissions included:

- less income
- long and unpredictable working hours
- poor facilities
- substantial occupational hazards
- lack of professional support

A further finding from this current study was that many rural practices could no longer provide after-hours service because their staff, primarily female, refused to undertake out-of-hours work. This situation may have helped to alleviate stress in younger associates, but it may have increased stress levels of older owners who felt badly about not providing after-hours services. If this practice were widespread, it

would result in failure by veterinarians to service the large animal industries. There would be major ramifications, from a national animal health perspective, if there were insufficient numbers of veterinarians in rural areas of Australia undertaking veterinary activities including exotic disease surveillance and could lead to non-veterinarians undertaking these roles. The inability of current veterinarians to adequately service the needs of rural Australia has, in part, enabled, James Cook University and Charles Sturt University to gain approval to establish new courses in veterinary science.

The Frawley Review,<sup>201</sup> while acknowledging that many veterinarians in rural practice were experiencing distress, paid scant attention to this area. It is disappointing that they failed to make any recommendations concerning the alleviation of stress in rural veterinarians.

#### **6.4.1.3      *Emotional health and injury***

Veterinarians, from their narrative accounts, revealed that they incurred many injuries because they were stressed, hurrying and not concentrating on the task at hand. They reported that many of their injuries occurred in the late afternoon or evening which could have been an indication of stress and/or fatigue.

Respondents with high distress levels did not have a significant increase in injuries or in the number of injuries. The exception was for back injury. Surprisingly, there was no difference in the reported use of pain-killers or analgesics, between those with back injuries and those without. The highest proportion of back injuries occurred in those younger than 35 years of age and this age group, had a significant association with distress.

#### **Recommendation 11**

*A larger sample size should be used in an investigation to assess if stress is a positive contributor to injury among veterinarians.*

### *Substance use, distress and depression*

This study did not show that alcohol consumption had any association with high distress levels. The results differ from findings in other studies where alcohol intake has been associated with depression and suicide.<sup>164</sup>

There were only 6% of smokers among respondents which is considerably less than the percentage of smokers reported for the general Western Australian population.<sup>201, 202</sup> The rate is similar, however, to that found in a recent overseas study which found that 9% of male and 4% of female veterinarians smoked.<sup>16</sup> Despite the low number of smokers, the study showed that smoking was significantly associated with distress. While most studies show that people smoke more because of stress, one study of adolescents found that depression and smoking perpetuated one another.<sup>203</sup>

From the Chi-squared analyses, taking non-prescription drugs in the previous 12 months was significantly associated with high distress levels for both males and females, with females demonstrating a higher association. Specific drugs associated with high distress levels were pain-killers, tranquillisers, antidepressants and analgesics. Marijuana, alcohol and amphetamine use were not associated with high distress levels and other drug usage was too low for analysis. No-one indicated that they were using pethidine or barbiturates and only a small number indicated they used ketamine. The Registrar of the Western Australian Veterinary Surgeons' Board<sup>b</sup> who regularly deals with the abuse of drugs in Western Australia veterinarians, indicated that the usage figures in this study do not accurately reflect what is happening in the profession, and may not represent an accurate estimation of the association between drug taking and distress.

#### **6.4.2 Other emotional health indicators**

There were a number of other measures of emotional health used in this study, that included the effect of after-hours calls on sleep, energy and family life, happiness, job satisfaction, anger frequency and remaining



working as a veterinarian. Using Chi-squared analyses, all factors were found to be significantly associated with distress scores.

After-hours duty had a major effect on the emotional health (ability to sleep, energy levels and family life) of veterinary respondents and it is not surprising that those respondents most affected by after hours calls were significantly unhappier on the scores of happiness. The *happiest* respondents worked 43 to 44 hours per week, the *not very happy* respondents worked 49 hours and the *miserable* respondents worked 62 hours a week. One can conclude from this data that those respondents who worked long hours were the unhappiest and the most distressed. It was therefore surprising that there was no significant association between hours worked and happiness for either males or females.

Respondents with the highest stress scores also expressed the greatest dissatisfaction with most items on the job satisfaction scale. This finding, together with those from the in-depth interviews support the notion that distress and stress are associated with job satisfaction. Overall, responses to the Warr job satisfaction scale<sup>2</sup> in This study were another useful indicator of work-related stress for veterinarians. In summary, Chi-squared analyses showed that seven major variables were significantly associated with high distress levels:

- gender (females more than males)
- practice ownership (associates more than owners)
- hours worked (longer hours compared with fewer)
- higher risk taking when first graduated
- having had a back injury over the past 5 years
- drug taking over the past 12 months
- age group (younger respondents more than older)

Variables that did not have a significant association with distress levels were:

- marital status
- case mix of animals
- anger

Using Chi-square, the sample size was not sufficient to support the number of variables associated with distress. It was necessary to use a step-wise logistic regression to increase the power of the test.

#### **6.4.2.1 Predictors of distress using logistic regression**

Variables such as anger, job dissatisfaction and unhappiness that may have been manifestations of distress, were not included in the logistic regression model to determine the significance of each factor. However, the *taking of drugs in the previous 12 month*, was included because it had been shown previously to be associated with injury among veterinarians.

Initially it was thought that having high psychological distress was a gender issue. Significantly more females, especially those employed as associates, showed a significant association with high psychological distress compared with males when Chi-squared analyses were undertaken. When logistic regression was used, however, gender was not a significant predictor of distress.

Logistic regression revealed three significant predictors for distress. These were:

- being under 35 years of age
- having had a back injury
- taking drugs in the previous 12 months

In essence, this study showed that having high distress levels was more a function of age than gender with those respondents less than 35 years of age most affected by distress.

#### **6.4.3 Stressors and coping strategies for stress in practice**

In this study, major stressors were attributed to being faced with aggressive or difficult clients followed by financial problems, interpersonal problems with staff, after-hours workload, having to work with difficult boss(es) and, concern for patients. Other stressors were time management, bureaucracy and lack of self-esteem. Euthanasia of animals rated quite low as a stressor.

Some associates interviewed indicated that they became highly stressed when having to face difficult owners. Findings from the narrative accounts indicated that veterinary employers were increasingly aware that veterinary practice was a “people business” and that there was a need for interpersonal skills for dealing with clients to be emphasized more during undergraduate and postgraduate training. This supports the suggestions made by Halliwell and Hoskin,<sup>174</sup> about reducing stress and the high suicide rate in UK veterinarians, that veterinary schools “must better prepare students for the quantum change that will occur on graduation”(p397)

#### **Recommendation 12**

*More emphasis could be placed on interpersonal and coping skills during undergraduate and postgraduate training, which could assist graduates with developing skills to balance work with family and social life.*

Information gained in the narrative aspects of the study suggested that some stress incurred by young graduates may have been due to a frustration in not being able to apply the advanced skills they learnt in veterinary school.

Some employers said they had difficulty in retaining female graduates in their practice for more than six months and cited a lack of physical skills as a possible reason. This situation was confirmed by female associates who had moved from working with large animals to small animals only, because of the physical and emotional demands placed upon them. This corroborates the findings of Heath and the Frawley Review that found more females worked in small animal practice with few wanting to own a practice.<sup>65, 200</sup>

The narrative aspects of this research have revealed that many new graduates received little, if any, supervision when they commenced working in a practice and this contributed to an erosion of confidence resulting in stress. The veterinarians’ responses indicated a need for mentoring to help them gain confidence in facing clients, other staff, handling animals and undertaking surgical procedures. Several employers stated they resented having to be present to spend time as

confidence builders. From their perspective, a lack of confidence was a major shortcoming in some new graduates who did not want to be left alone to undertake even basic surgery. They wanted new graduates to be confident to undertake procedures without them having to be present.

Mentoring programs may assist new graduates gain confidence. Both employers and associates indicated they believed there was a need for mentoring to assist in this area. The veterinary schools must play their part in ensuring that students gain self-assurance to enable them to face clients, and that they have the skills to cope with unexpected situations in practice. Confidence building is an area that needs to be addressed in the undergraduate training of veterinarians as well as during the early years after graduation. Both the veterinary profession and veterinary schools must contribute equally to the personal development of new graduates and a balance needs to be found between these. The Australian Veterinary Association New Graduate Friendly Practices scheme<sup>204</sup> has been developed to:

*encourage veterinary practices to become more aware of the particular difficulties encountered by new and recent graduates when they enter professional life and to provide a range of active support for these young veterinarians to ease their way into the profession.*

Extra time is spent with new graduates in practices to help them develop confidence and skills. The scheme has proven to be a boon for both the new graduates and the practices that employ them. Subjects interviewed indicated that mentoring programs could help new graduates develop skills in areas not covered in any depth in their undergraduate course. However, such strategies do not help those graduates cope when they suddenly find themselves outside their comfort zone.

### **Recommendation 13**

*A more comprehensive and coordinated approach is developed to support veterinarians throughout their training and early after graduation, to ensure they have confidence and develop further, their veterinary abilities.*

During the interviews, life stressors such as the death of a family member, being retrenched, changing jobs and financial insecurity, were raised as major events that had influenced the subjects' abilities to cope. These findings support those of a Canadian study<sup>155</sup> which found that life stressors had a greater effect on psychological well-being of individuals than did work stressors.

#### **Recommendation 14**

*Future studies investigating stress and mental well-being of veterinarians should include an investigation of life events that may impact on emotional health and stressors in the workplace.*

#### **6.4.4 Distress and mental health**

As reported in previous chapters, psychological distress is generally regarded as a good indicator of the level of mental illness in any population.<sup>160, 205</sup> Higher than normal distress levels in respondents in this study indicated that they were not only stressed, but may have been experiencing mental health problems such as depression.

The 9% of respondents who indicated they were taking antidepressants were spread across all age and gender groups, and practice owners and associates. According to the US National Institute of Mental Health<sup>206</sup> and the National Health Survey on Mental Health,<sup>154</sup> in any one year, 10% of the population has long-term mental or behavioural problems. The most commonly reported mental and behavioural problems were mood (affective) and anxiety related problems, which affected 4.5% of the population. The results from the present study, suggests that there may be more than double the number of mood disorders in the veterinary profession compared with the general population and supports results from the Veterinary Surgeons Board of WA 2001 survey where 15% of respondents reported they had been diagnosed with clinical depression and 22% had a family history of depression (See Appendix A).

The recent findings of the US National Comorbidity Survey Replication study<sup>160, 205, 207, 208</sup> revealed that of those people with mental health illness, 50% of cases were already present by the age of 14, and 75% by the age of 24 years. Kessler,<sup>17</sup> when asked whether veterinary schools might be recruiting students already experiencing mental health problems, indicated in a personal communication to the researcher, that:

*it is possible that selection exists. Perhaps socially anxious people find their way into veterinary medicine instead of other professions. Another possibility is that childhood mental illness is the same for vets as others in the population but that the job conditions of being a vet lead to persistence of these problems more among vets than others.*

If retrospective studies did indicate that veterinarians already had mental health problems or were prone to mental illness when they entered the profession, then a screening process could be developed and used to identify those for whom the stress of working as veterinarians might lead to the exacerbation of pre-existing emotional concerns.

#### **Recommendation 15**

*A comprehensive prospective and retrospective study of mental health in veterinarians should be undertaken that includes childhood mental health conditions. It would be preferable to use an existing interview schedule such as that used in the National Health Survey on mental health to enable comparisons to be made with the general population.*

Most students enter veterinary science courses from Year 12 and these courses attract very high achievers. According to The Good Universities Guide,<sup>57</sup> 75% of those entering the veterinary science course are now female. This is because females generally achieve better academic results in Year 12 than males and in Western Australia, high achieving males prefer to apply for courses such as Engineering, Science and Law. It is possible that some people have chosen veterinary science ahead of medicine because of a preference to work with animals rather than people, not realising that veterinary practice requires considerable face-

to-face contact with clients. As noted in the literature review, Haliwell and Hoskin<sup>174</sup> observed that students in the UK entering the veterinary profession, may be vulnerable to stress and suicide, not only because they are highly intelligent, but the degree is very demanding which could limit the “development of communication skills and emotional maturity.”

As indicated previously, Kessler commented on the findings of this study, suggesting that some applicants may be unsuited for veterinary practice because they might already have pre-existing mental health conditions when entering the profession. On the other hand, he stated that those entering the profession may have similar levels of mental health illness as the general population, and that veterinary practice may exacerbate mental health problems.

Potential students wishing to gain admission to Australian medical schools, now sit for a comprehensive skills and aptitude test (Graduate Australian Medical Schools Admission Test- GAMSAT, or Undergraduate Medicine and Health Sciences Admission test – UMAT) as well as an interview before acceptance into their programs.

Veterinary schools should also consider aptitude testing as well as interviews. There are of course, ethical issues about whether people with the propensity to develop mental health conditions, should be prevented from becoming veterinarians. Nevertheless, a more comprehensive screening process, could help in identifying applicants unsuited for veterinary practice but who could, for example, have a career in research if the latter were found to be a less stressful career. More importantly, the screening process could identify those for whom more support was necessary.

**Recommendation 16**

*Interviewing and aptitude tests need to be developed for veterinary students undertaking clinical studies to determine their suitability for clinical practice.*

Analysis of the coroner's records for two Australian states showed that the suicide rate of veterinarians is approximately four times that of the general adult population in Australia.

Although there is a popular notion that suicide occurs in younger veterinarians, the limited evidence presented in this study does not support this, at least, for male veterinarians, where suicide was spread evenly across all age groups. There were only two suicides for females and as such, no conclusions can be drawn about suicide and age group in females.

In the cohort used in the present study, the method used for committing suicide was almost exclusively drug-related and consistent with that found for veterinarians and medical doctors overseas.<sup>52, 175</sup>

While veterinarians euthanase animals routinely, this study did not find any evidence to support the contention that it is constant exposure to the death of animals that contributes to veterinarians wishing to kill themselves.<sup>52</sup>

The results of this study confirm that veterinarians are more distressed than the general population and have the means of killing themselves because they have access to lethal drugs.

There was, however, difficulty in obtaining data on suicide for all Australian veterinarians and studies need to be undertaken on a national level to determine if suicide rates are similar throughout Australia.

#### **Recommendation 17**

*The rate of suicide among Australian veterinarians needs to be regularly monitored using data from the National Death Index and strategies implemented to prevent suicide in veterinarians. The Australian Veterinary Association should take the lead in this.*



### 6.5.1 Reduction of suicide

The rate of suicide among veterinarians in the UK is high and it appears also to be high among Australian veterinarians. This should be of concern, not only to the veterinary profession, but also to the general public and health providers. Even though there appear to be high numbers of veterinarians experiencing depression and other mental health problems, risk factors for suicide have not been identified.

Reducing the rate of suicide will be complex and a difficult undertaking.

It has been suggested in the UK<sup>174</sup> that selection of highly intelligent students into veterinary courses which are particularly demanding, may contribute to emotional vulnerability. Upon graduation, many UK graduates moved from their "closeted and supportive university environment to the comparative isolation of general practice" where often, there was little if any support.

This study has shown that a similar situation occurs in Australia, where many new graduates have become highly stressed when they were expected to work on their own with little support.

Controlling access to drugs used for suicide is unlikely to control suicide ideation and suicide in veterinarians. Drug control would also be a "band aid" approach and not address the underlying issues that contribute to suicide.

As a result of this study, the researcher has become involved with a volunteer group of veterinarians in Western Australia that lectures to veterinarians about stress, depression and suicide. The researcher has been able to use the data from this study to support presentations based on current, well-informed and reliable information. In 2005, a seminar held in Perth was attended by more than 60 veterinarians and over 30 people attended another, in a rural area. The number of attendees indicate considerable interest by individual veterinarians in emotional well-being. This research project provided the initial impetus for the volunteer group that has now contacted more than 180 veterinarians and provided them with details about emotional well-being and informing them where they can seek help. There is already some indication that

veterinarians are now more willing to discuss the potential problems associated with stress and suicide ideation.

The manner in which information about stress and suicide is presented requires considerable sensitivity, especially where young people are concerned. Any information disseminated about stress and suicide should be balanced with advice about how to alleviate stress among veterinarians and where to obtain support and mentoring. Ultimately one must also highlight the wonderful and unique rewards of the profession and its contribution to the well-being of animals and the community.

## 6.6 SUMMARY

Overall, there were eight objectives in this study and the research undertaken has fulfilled them. Both qualitative and quantitative methods were useful and valid in determining the extent of injury, disease and emotional health status of veterinarians. Three sources of data were used for the study and have provided a comprehensive understanding about some of the risk factors these for veterinarians.

Levels of injury, stress, distress, depression and suicide were shown to be of major significance in the veterinary study population.

Recommendations have been made to improve future data collection, reduce injury, disease and stress levels, especially in young graduates and support veterinarians in practice.

Veterinarians play an essential role in enhancing the health of society through looking after the health and well-being of animals for farmers and the urban community. Veterinarians' strong work ethic may provide insight into why so many become injured and stressed.

Wisconsin physician, Jeffery Landercasper, who undertook one of the earliest investigations of injury in veterinarians in a personal communication to the researcher<sup>28</sup> wrote:

*From my perspective of being married to a veterinarian and of talking with many veterinarians over the years, I am truly impressed with the amount of trauma they sustain. I also find they tend to minimize their injuries and are so motivated in their work they claim little disability, whereas similar injuries in other patients result in claims of major disability.*

Injury and stress among veterinarians has largely gone unnoticed, partly because relative to other health professions, the veterinary profession is few in number. This has meant that government and health authorities have paid little attention to them as a group. Veterinarians may also be partly to blame for often making light of their injuries and failing to report serious injuries to insurance companies. There is no doubting that as a group, they are dedicated to the animals and communities they serve, often continuing to work when they have been seriously injured. Recognition by veterinarians themselves that they are at risk from injuries, zoonotic diseases, stress and suicide, should go some way to minimising risks and thereby reducing the incidence of these in the veterinary profession.

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**Appendix A:** Questionnaire and summary of 2001 survey by Veterinary Surgeons Board of WA.

## Survey of Factors Affecting Stress In Veterinarians

Thank you for taking the time to complete this survey.

Due to the significant and often stressful demands placed on veterinarians, a working party was established in New Zealand to address the issue of support for veterinarians. One of the first actions arising from the group is this survey. The purpose of this survey is to help understand the factors that are contributing to the stress vets are facing and to identify areas where support can best be provided.

You should find the questionnaire straightforward to answer. Usually all you need to do is circle a number. Sometimes you may need to write in comments - there will be spaces for you to write your comments when needed. In total, this survey should only take about 15 minutes to fill in.

The responses to the survey are completely confidential. Your answers will be combined with the others so that you will not be able to be individually identified. To ensure your anonymity, you are not asked to include your name or any contact details.

Once you have completed the questionnaire, please return it to the Veterinary Surgeons Board in the pre-paid envelope provided by **Monday 7<sup>th</sup> May 2001**

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*Q1 In what year did you complete your veterinary degree? \_\_\_\_\_*

*Q2 Which one of the following best describes the type of organisation you work for?*

**Circle one number only**

- Small animal practice .....1
  - Large animal practice.....2
  - Mixed animal practice.....3
  - Consultancy .....4
  - Equine practice.....5
  - Other practice .....6
  - Agriculture WA .....7
  - Meat Inspection .....8
  - Other Government .....9
  - Teaching/Research.....10
  - Industry .....11
  - Retired .....12
  - Other (please specify).....13
- 

*Q3 Do you have people who report to you, or who you manage?*

- Yes .....1
- No.....2

Q4 Do you have a financial share in your place of employment?

- Yes .....1
- No.....2

Q5 How many other people in your organisation do you work with on a day to day basis?

- I work alone.....1
- 1 to 4 others .....2
- 5 to 9 .....3
- 10 or more .....4

Q6 Using the following scale, on average, how stressed would you say you are with your life in general?

- Extremely stressed .....1
- Very stressed .....2
- Quite stressed.....3
- Moderately stressed .....4
- Slightly stressed .....5
- Not at all stressed.....6

Q7 And thinking about a typical workday, what would be the most stressed you feel in a typical workday?

- Extremely stressed .....1
- Very stressed .....2
- Quite stressed.....3
- Moderately stressed .....4
- Slightly stressed .....5
- Not at all stressed.....6

Q8 Now thinking about the single most stressful situation you find yourself in at work, what would that be?

**Please write in your answer**

---

Q9 And on the following scale, please indicate how stressful that situation is

- Extremely stressful .....1
- Very stressful.....2
- Quite stressful .....3
- Moderately stressful.....4
- Slightly stressful .....5
- Not at all stressful .....6

Q10 And when the single most stressful situation occurs, how does it make you feel?

**Circle one number only**

- I feel like my life isn't worth living any more ..... 1
- I feel like quitting my job..... 2
- I feel like I need to reassess where I'm going with my life  
(both work and personally)..... 3
- I feel like I need to 'get away from it all' for a few days..... 4
- I feel like I need to talk about it with someone else ..... 5
- I feel like I need to take a few minutes 'time out' from the situation..... 6
- I do not feel stressed at all..... 7

Q11 Following is a list of work related factors that may contribute to the amount of stress you feel. Please indicate how much each of these factors affect how stressed you feel.

**For each factor circle one number only**

	Does not contribute to the stress I feel				Is a major contributor to the stress I feel			
	1	2	3	4	5	6	7	
<i>Work hours</i>	1	2	3	4	5	6	7	
<i>Employer/Colleague expectations</i>	1	2	3	4	5	6	7	
<i>Client expectations</i>	1	2	3	4	5	6	7	
<i>Communications with clients</i>	1	2	3	4	5	6	7	
<i>Work place relationships</i>	1	2	3	4	5	6	7	
<i>Resources available to me</i>	1	2	3	4	5	6	7	
<i>Amount of support from senior staff/employers</i>	1	2	3	4	5	6	7	
<i>Amount of professional support</i>	1	2	3	4	5	6	7	
<i>Unexpected outcomes</i>	1	2	3	4	5	6	7	
<i>Legal issues (including the threat of litigation, privacy and confidentiality, compliance with regulations and registration requirements).</i>	1	2	3	4	5	6	7	

If you are in clinical practice, please answer Q12, otherwise go to Q13.

Q12 Following is a list of work related factors that may contribute to the amount of stress you feel. Please indicate how much each of these factors affect how stressed you feel.

**For each factor circle one number only**

	Does not contribute to the stress I feel				Is a major contributor to the stress I feel		
<i>Physical demands of the job</i>	1	2	3	4	5	6	7
<i>After hours on call duties</i>	1	2	3	4	5	6	7
<i>Euthanasia of animals</i>	1	2	3	4	5	6	7
<i>Responsibility of animal's lives</i>	1	2	3	4	5	6	7
<i>Times when you have sole charge</i>	1	2	3	4	5	6	7

Q13 Following is a list of skill and expertise related factors that may contribute to the amount of stress you feel. Please indicate how much each of these factors affect how stressed you feel.

**For each factor circle one number only**

	Does not contribute to the stress I feel				Is a major contributor to the stress I feel		
<i>My level of technical skills</i>	1	2	3	4	5	6	7
<i>My level of client management skills</i>	1	2	3	4	5	6	7
<i>My level of communication skills</i>	1	2	3	4	5	6	7
<i>My ability to keep pace with technology</i>	1	2	3	4	5	6	7
<i>My ability to keep up with new techniques/ knowledge</i>	1	2	3	4	5	6	7
<i>My understanding of legal requirements</i>	1	2	3	4	5	6	7

Q14 Following is a list of personal factors that may contribute to the amount of stress you feel. Please indicate how much each of these factors affect how stressed you feel.

**For each factor circle one number only**

	Does not contribute to the stress I feel				Is a major contributor to the stress I feel		
	1	2	3	4	5	6	7
<i>Personal/family relationships</i>	1	2	3	4	5	6	7
<i>My personal health</i>	1	2	3	4	5	6	7
<i>My family's health</i>	1	2	3	4	5	6	7
<i>Family needs</i>	1	2	3	4	5	6	7
<i>Self esteem</i>	1	2	3	4	5	6	7
<i>Debt/Student loans</i>	1	2	3	4	5	6	7
<i>Disposable income</i>	1	2	3	4	5	6	7
<i>Managing my finances</i>	1	2	3	4	5	6	7
<i>Any addictive behaviours (such as gambling, alcohol, drugs etc)</i>	1	2	3	4	5	6	7
<i>Not meeting my own expectations</i>	1	2	3	4	5	6	7
<i>Unavailability of suitable employment</i>	1	2	3	4	5	6	7



*Q15 Below is a list of support systems that could be available to you in times of stress. Thinking about times when you have been under a lot of stress, could you please indicate which of these support systems you have or haven't used in the past, and which you think you would or wouldn't use in the future. Then for each one, could you say what it is about that support system that made you decide that you either would or wouldn't use it in the future.*

<b>Family/ Friends</b>	Have used ..... 1	Would use .....1	Why?
	Haven't used.. 2	Wouldn't use..2	
<b>Workmates</b>	Have used ..... 1	Would use .....1	Why?
	Haven't used.. 2	Wouldn't use..2	
<b>Employers</b>	Have used ..... 1	Would use .....1	Why?
	Haven't used.. 2	Wouldn't use..2	
<b>Other Vets (not your employer/ workmates)</b>	Have used ..... 1	Would use .....1	Why?
	Haven't used.. 2	Wouldn't use..2	
<b>AVA Mentor scheme</b>	Have used ..... 1	Would use .....1	Why?
	Haven't used.. 2	Wouldn't use..2	
<b>Vets in Stress phoneline</b>	Have used ..... 1	Would use .....1	Why?
	Haven't used.. 2	Wouldn't use..2	

Q15 Continued

**Employer funding counselling** Have used ..... 1 Would use .....1  
Haven't used.. 2 Wouldn't use..2

Why?

**Private counselling** Have used ..... 1 Would use .....1  
Haven't used.. 2 Wouldn't use..2

Why?

**GP or other health professional** Have used ..... 1 Would use .....1  
Haven't used.. 2 Wouldn't use..2

Why?

**Spiritual/Pastoral** Have used ..... 1 Would use .....1  
Haven't used.. 2 Wouldn't use..2

Why?

Q16 How often do you feel depressed?

Never/virtually never ..... 1  
Occasionally .....2  
Reasonable often.....3  
Often .....4  
Nearly all the time/all of the time.....5

	Yes	No
Q17 a) Have you ever been clinically diagnosed as suffering from depression.....	1	2
b) Are you currently suffering from clinical depression.....	1	2
c) Have you ever seriously thought about committing suicide.....	1	2
d) Have you ever attempted to commit suicide.....	1	2
e) Do you feel you have a good network of friends and family who you can talk to about stress related issues .....	1	2
f) Is there a history of depression in your family.....	1	2
g) Have any members of your family attempted to commit or committed suicide ....	1	2

Q18 What would you say is the single most satisfying situation you find yourself in at work?  
**Please write in your answer**

---

And finally some questions about you and your household.

Q19 In what year were you born? \_\_\_\_\_

Q20 Are you male or female?

Male .....1  
 Female.....2

Q21 Into which of the following range does your personal income fall (from all sources before tax)?

Q22 Into which of the following range does your household's total income fall (from all sources before tax)?

	<i>Personal Inc</i>	<i>Household Inc</i>
Under \$20,000 .....	1	1
\$20,000 to \$29,999 .....	2	2
\$30,000 to \$39,999 .....	3	3
\$40,000 to \$49,999 .....	4	4
\$50,000 to \$59,999 .....	5	5
\$60,000 to \$69,999 .....	6	6
\$70,000 to \$79,999 .....	7	7
\$80,000 to \$99,999 .....	8	8
\$100,000 to \$119,999 .....	9	9
\$120,000 to \$139,999 .....	10	10
\$140,000 to \$149,999 .....	11	11
\$150,000 to \$200,000 .....	12	12
Over \$200,000 .....	13	13

Q23 Do you have a student loan?

Yes .....1  
 No.....2

Q24 How many adults are there living in your household? \_\_\_\_\_

Q25 How many children are there living in your household? \_\_\_\_\_

Q26 Are you currently living with a spouse or partner?

Yes .....1  
No.....2

**Thank you very much for completing this survey. Please send it to the  
Veterinary Surgeons' Board of WA in the prepaid envelope provided.**

## 1.1 Veterinary Surgeons' Board of Western Australia Survey –Analysis of results

This survey was initiated to look at the stress levels of veterinarians. It was based on a similar survey undertaken by the New Zealand Veterinary Association. This resulted in responses from 469/700 (67%) veterinarians. The survey was based on a similar study by the New Zealand Veterinary Council the results of which were sent to their members.

## 1.2 Demographic data

### 1.2.1 Gender

Slightly more females (51.2%) than males (48.8%) of the 469 responded to the questionnaire.

### 1.2.2 Types of veterinary work

Nearly half (48%) of respondents worked solely with small animals, 22% were in mixed animal practice and fewer than 5% in each of the other categories including teaching and research, government, horses (Table 1).

Table 1 Type of veterinary work undertaken

		type of organisation			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	small animal practice	213	45.4	46.1	46.1
	large animal practice	2	.4	.4	46.5
	mixed animal practice	105	22.4	22.7	69.3
	consultancy	13	2.8	2.8	72.1
	equine practice	12	2.6	2.6	74.7
	other practice	4	.9	.9	75.5
	Agriculture WA	24	5.1	5.2	80.7
	meat inspection	5	1.1	1.1	81.8
	other govt	4	.9	.9	82.7
	teaching / research	25	5.3	5.4	88.1
	industry	11	2.3	2.4	90.5
	retired	15	3.2	3.2	93.7
	other	29	6.2	6.3	100.0
	Total	462	98.5	100.0	
	Missing	System	7	1.5	
Total		469	100.0		

### 1.2.3 Age of respondents and family

The average age of respondents to this questionnaire was 39.78 (SD=11.73) with a range from 23-80 and more than 75% were in a relationship with a spouse or partner while 41.6% had from 1-6 children in their households. The average number of children per veterinarian with children was 2.

### 1.2.4 Personal and household income

Personal income before tax showed that 73.4% were earning less than \$70,000 per annum with 38.5% of households earning less than \$70,000. The average number of adults in each household was 2.03. Unfortunately the questionnaire did not ask the hours worked and determine whether the respondents were full or part-time. It is likely with the large number of female respondents that many of these would have been part-time and hence the average income was lower than expected.

### 1.3 Job satisfaction

Veterinarians were asked *What would you say is the single most satisfying situation you find yourself in at work* and, appreciation, a successful outcome for all, success after a difficult case and saving severely ill patients accounted for 73% of all responses.

### 1.4 Stress

*Veterinarians were asked "on average, how stressed are you with your life in general?*

More than 29% of respondents indicated they were quite stressed to extremely stressed with another 35.4% moderately stressed. Only 35.3% said they were not at all stressed or only slightly stressed. When asked *what would be the most stressed you feel in a typical working day?*, 51.9% indicated being quite stressed through to extremely stressed.

Respondents were asked to indicate the single most stressful situation at work, but many gave multiple answers (up to four were given). Nearly 25% indicated that complaints from aggrieved or aggressive clients caused most stress closely followed by work overload (21.2%), complicated cases (19.4%), meeting deadlines (12.1%), death of an animal (11.9%), internal conflicts (8.4%) and lack of experience (5.9%).

When asked how stressful was their single most stressful situation, nearly 90% indicated quite to extremely stressful with only 6.8% claiming it was only moderately stressful and only 3.6% only slightly or not at all stressful.

When asked *when the single most stressful situation occurs, how does it make you feel?*, 47.1% said they contemplated quitting their job or reassessing their lives. Only 1.3% indicated they did not feel stressed while 2% indicated their lives weren't worth living. (Table 2)

**Table 2** How does that most stressful situation make you feel?

	Frequency	Valid Percent
life not worth living	9	2.0
quitting job	102	22.8
need to reassess life	109	24.3
"get away from it all"	63	14.1
talk to someone	77	17.2
take "time out"	82	18.3
Do not feel stressed	6	1.3
Total	448	100.0
Missing values	21	

When veterinarians were asked to indicate how each of a series of work factors contributed to the amount of stress felt, work hours, unexpected outcomes, legal issues and client expectations were the four major contributors with those veterinarians in clinical practice indicating that the major contributor was after hours on call duties followed by responsibility for animals' lives. Surprisingly, euthanasia of animals and physical demands of the job were only minor contributors to stress.

When asked which support systems had been used or would be used when veterinarians were under a lot of stress, most veterinarians' had used family and friends (93.4%) followed by workmates (77.4%), other vets (66.7%), employers (49.9%), GP or other health professional (30.3%), private counselling (26.2%) and spiritual/pastoral (17.7%). Similar usage would occur for future support.

Veterinarians were asked how often they felt depressed and the following was obtained.

**Table 3 Frequency of depression**

	Frequency	Valid Percent
Never/ virtually never	91	19.9
Occasionally	250	54.6
Reasonably often	68	14.8
Often	36	7.9
Nearly/ all the time	13	2.8
Total	458	100
Missing	11	

This means that close to 25% of veterinarians indicate that they are often depressed which is a cause for concern. Interestingly 22.1% said they had a family history of depression, 18.2% said they had seriously thought about committing suicide, 14.8% said they had been diagnosed with clinical depression, 14.4% indicated that family members had attempted or committed suicide, 6.6% said they were currently suffering from clinical depression at the time of the survey and 2.2% said that they had actually tried to commit suicide. Nevertheless, just 80% said that they have a good network to talk about stress related issues that leaves close to 20% without such a network.

A Chi Square analysis to determine if stress was dependent on age group, graduation year or gender showed there was no significant dependence. Age groups by levels of stress are shown in Table 4 with Years since graduation by levels of stress (Table 5) and gender by levels of stress (Table 6).

**Table 4 Grouped ages by stress**

	Stressed		Non stressed		Total n
	n	%	n	%	
23-25 yrs	8	24.2	25	75.8	33
26-30 yrs	21	27.3	56	72.7	77
31-35 yrs	25	29.8	59	70.2	84
36-40 yrs	29	37.2	49	62.8	78
41-45 yrs	17	32.7	35	67.3	52
46-50 yrs	14	31.8	30	68.2	44
51-55 yrs	8	25.8	23	74.2	31
56-60 yrs	5	20.8	19	79.2	24
61-70 yrs	4	18.2	18	81.8	22
71+ yrs			7	100.0	7
Total	131	29.0	321	71.0	452



The results were not significant ( $\chi^2=8.590, p=0.476$ ).

Table 5 Years since graduation by stress levels

	Stressed		Non stressed		Total
	n	%	n	%	n
1-2	8	22.9	27	77.1	35
3-5	16	32.0	34	68.0	50
6-10	29	34.1	56	65.9	85
11-15	24	28.9	59	71.1	83
16-20	24	33.8	47	66.2	71
21-25	15	38.5	24	61.5	39
26-30	7	20.6	27	79.4	34
31-35	3	15.0	17	85.0	20
36-40	4	28.6	10	71.4	14
over 40			11	100.0	11
Total	130	29.4	312	70.6	442

$\chi^2=11.864, p=0.221$

Table 6 Gender by stress levels

	Stressed		Non stressed		Total
	n	%	n	%	n
male	57	25.7	165	74.3	222
female	76	32.5	158	67.5	234
Total	133	29.2	323	70.8	456

$\chi^2=2.552, p=0.110$

Due to the ordinal nature of the response variable (stressed versus not stressed) a logistic regression model was used to estimate odds ratios for the independent variables in the model. The following independent variables were entered into the logistic regression as covariates : age, number of children in the household and years since graduation.

The independent variables entered into the logistic regression as factors included: gender, type of organisation, whether the vet had financial share in their place of employment, whether they were currently living with a spouse or partner and household income.

The reference variables were male (gender), small animal practice (type of organisation), have financial share in place of employment, currently living with spouse or partner and household income greater than or equal to \$100,000.

There are statistically significant increased odds of being stressed the more children there are in the household (OR=1.3, p=0.006, 95%CI.=1.1, 1.6)

There are diminished odds of being stressed the longer the amount of time since graduation, being male and working in a mixed/large practice. There are increased odds of being stressed the older the vet is, working in a practice classified as 'other', having a financial share in the place of employment, currently living with a spouse or partner and having a lower salary. However these odds were not statistically significant (Table 7).

**Table 7 Logistic regression for stress and certain variables**

	B	Std error	Sig.	Exp(B)	95% CI	
					Lower Bound	Upper Bound
Age	0.03	0.03	0.310	1.03	0.97	1.09
Number of children in household	0.27	0.10	0.006	1.31	1.08	1.58
Years since graduation	-0.05	0.03	0.077	0.95	0.89	1.01
Gender (male)	-0.37	0.28	0.177	0.69	0.40	1.18
<b>Type of organisation</b>						
Mixed/large practice	-0.05	0.29	0.878	0.96	0.54	1.70
Other	0.26	0.29	0.371	1.29	0.74	2.27
Have financial share in place of employment	0.42	0.29	0.150	1.52	0.86	2.69
Currently living with spouse or partner	0.04	0.32	0.910	1.04	0.55	1.95
<b>Household income</b>						
<\$60,000	0.43	0.33	0.194	1.53	0.80	2.92
\$60,000-\$99,000	0.06	0.28	0.830	1.06	0.61	1.83

Reference: male, small animal practice, income >=\$100,000

**Appendix B:** Preliminary Questionnaire sent to Phase 1 subjects prior to interview

# DISEASE AND INJURY IN AUSTRALIAN VETERINARIANS

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For the purposes of this study, veterinary practice is defined as any time spent working as a registered veterinarian involving direct or indirect contact with animals, animal products, or other associated work. Indirect contact includes consultation with clients, administrative work in the hospital or clinic, and/or contact with animal tissues including carcasses, laboratory samples such as blood or urine, and/or veterinary pharmaceuticals such as vaccines or drugs.

## SECTION A Demographic Data

- 1 What year did you graduate from veterinary school or college \_\_\_\_\_  
Which University? \_\_\_\_\_
- 2 How many years have you been working (or did you work) in the veterinary field? (include all types of veterinary work according to the definition provided.) \_\_\_\_\_ years
- 3 Have you had any advanced specialty training Yes 1 No 2
- 4 If yes, in what specialty(ies)? \_\_\_\_\_
- 5 Are you registered or certified as a specialist in any specialty? Yes 1 No 2
- 6 If yes, in what specialty(ies)? \_\_\_\_\_
- 7 What was your date of birth [\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_]   
 day month year
- 8 Have you worked, in Australia during the past 20 years (Circle one number) Yes 1 No 2
- 9 If you have not worked as a veterinarian in the past year it was because you are:
- |                                      |   |                               |    |
|--------------------------------------|---|-------------------------------|----|
| Retired                              | 1 | In non- veterinary employment | 2. |
| Undertaking home duties/childrearing | 3 | Other                         | 4  |
- (please specify area of work or reason) \_\_\_\_\_
- 10 Please mark the states/territories of Australia in which you currently work as a veterinarian
- |    |     |     |    |     |     |     |    |                    |
|----|-----|-----|----|-----|-----|-----|----|--------------------|
| SA | ACT | QLD | NT | NSW | TAS | VIC | WA | OFFSHORE TERRITORY |
|----|-----|-----|----|-----|-----|-----|----|--------------------|
11. What type of practice are you in please?  
Private Clinical Practice
- Single vet Multiple vet Mobile practice Locum/relief work Other (specify) \_\_\_\_\_

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12. Do you own your own practice ? Alone Partner Multiple
13. How many hours a week do you spend in contact with animals? \_\_\_\_\_ hrs/week
14. How experienced do you regard yourself with the following. Check/ appropriate response

	Animal species	Experience handling animal species		
		Experienced	Some experience	No experience
1	Dogs			
2	Cats			
3	Pet Birds			
4	Other pets (ferrets, rabbits, guinea pigs, rats etc)			
5	Horses			
6	Pigs			
7	Cattle			
8	Sheep			
9	Goats			
10	Poultry			
11	Australian native animals (kangaroos, emus, koalas etc)			
12	Snakes, lizards, terrapin etc			
13	Zoo/marine animals			
14	Exotic animals (deer, ostrich, llamas, alpacas etc)			
15	Laboratory animals			
16	Other animal species			

15. About what percentage of your work time during 2001 was spent in each of the following?

	Activity	% of Time
1	Direct animal contact (eg. examination/taking blood samples/surgery)	
2	Consultation without animal contact (telephone and face-to-face)	
3	Administrative/managerial work,	
4	Reading journals/continuing education/web searches	
5	Driving	
6	Laboratory work/pathology	
7	Meat/food inspection	
8	Community activities/school visits etc	
9	Other (specify)	
	TOTAL	100%

Can you please list chronologically what injuries you have had in your lifetime?

Can you please list chronologically what diseases you have had?

Your telephone and availability please?

*All information gathered will be kept strictly confidential and any publication will be of grouped data and have all identifying data removed.*

**Appendix C:** Sample of narrative accounts of interviews from Phase 1

## VETERINARIAN STORIES

### 1 JANE

#### **Introduction**

Jane is a 37 year old female veterinarian, married to an oil production technician who works on a fly in-fly out basis in the Middle East. They have two small children. She worked full-time until she received an injury to her neck nine years ago. She currently works part-time in a small animal veterinary practice however still continues to have problems with her neck.

#### **Veterinary career**

As a small child, Jane recalls how obsessed she was by animals. She always wanted to become a veterinarian and but briefly "flirted" with the idea of doing medicine she thinks, because her father was a doctor. As she indicates, she changed her mind after applying for University and luckily was able to get into the course she really loved, veterinary science.

Jane graduated 15 years ago and immediately commenced work in a multi-veterinarian small animal practice in a capital city. She loved working there but yearned to travel and was given ten months unpaid leave to pursue some locum opportunities in England. She returned to the practice where after three years she received a severe neck injury. After working part-time on restricted duties, she had her first child and was off work for 6 months before returning initially for 10-15 hours a week but gradually building up to about 30 hours a week. She now works part-time at another veterinary practice, but still experiences painful episodes in her neck.

#### **Injuries - small animal**

According to Jane, it was late one Friday afternoon when she was in a hurry to leave after spending a long time spaying an overly fat bitch. Having completed the operation, she and her nurse were lifting the dog from a stretcher into the kennel when it slipped and her neck and shoulder bore the full weight of the dog when she tried to protect the veterinary nurse from taking the dog's full weight. She still recollects how painful it was even after putting the dog back in its cage and it still hurt on her way home. She took

Panadeine Forte to relieve the pain however, two days later when she returned to work, she felt worse. She had difficulty standing up and was suffering severe headaches. She also had paraesthesia, a form of paralysis a symptom of which is pain and numbness down the arms and into the fingers. X-rays and Medical Resonance Imaging (MRI) showed her to have a serious injury and she was hospitalised for two weeks lying on her back. A further three weeks at home on her back did not improve her symptoms. In spite of intensive medical treatments and regular physiotherapy she continued to experience pain, fatigue and sleeplessness for a long time.

Jane returned to part-time work still experiencing pain and fatigue over the next few months. She also followed a rehabilitation program arranged through Workers Compensation which she considered to be "excellent". There was gradual improvement in her condition and Jane felt she could fulfil her desire to work. However, she felt that her disability and part-time work placed greater pressure on her colleagues whom she thought she was letting down. Her slow but consistent recovery was jeopardized several months later when she automatically went to lift an old dog onto the table. Coincidentally, the client was unable to assist because he had a sore back.

This resulted in a regime of pain killers and anti-inflammatory medication but this time she was off work for about ten weeks. Fortunately Jane's salary was covered under Workers Compensation while she was totally incapacitated and it subsequently covered the gap when she was only able to work part time.

### **Effect on social life**

As a direct result of Jane's neck injury, home life became very difficult. She was newly married and her husband worked offshore. She had difficulty showering, washing her hair and holding a kettleful of water (although she could manage one cup at a time). In fact she even had difficulties holding a book. Jane reported she was not depressed but was very frustrated at her inability to undertake even basic and essential tasks such as hanging out washing, ironing, vacuuming the house or even cleaning her teeth.

This injury also affected her more public life by limiting regular physical exercise and above all, prevented her from playing tennis, a sport which she had previously enjoyed.



When Jane had her first child her neck still caused her major problems and she found that often she was unable to lift her baby out of the cot, and she found it easier to change the baby's nappy on the floor. She also purchased the lightest pram possible for lifting in and out of the car. With her husband being away from home regularly, Jane could not rely on his support to undertake essential every day activities. She reported she made her baby walk early, at nine months, so she would not have to carry her.

Two years later just prior to her second child being born, Jane was working about 25 hours a week as a veterinarian. She still had difficulty undertaking tasks as a mother although felt that she was improving, albeit slowly. Jane attributes the improvement in her neck to the exercise program designed by her rehabilitation specialists and to Panadeine Forte to relieve the pain. She says that she has tried various massage techniques, acupuncture and even in desperation, an energy balancing healer, which provided some relief but on reflection she thinks that maybe it was her positive thinking.

Currently, some nine years later, Jane still has episodes of extreme pain in her neck and arms. These generally last about two or three weeks however recently she has had the problem for a period of four months. She has been told that she has a bulging disk at C5-C6 with nerve root impingement. Recently her pain specialist injected her neck with corticosteroid and local anaesthetic which she says has resulted in excellent relief which she really hopes will be permanent.

Her children are now six and a half and three and a half years old and have become used to not being lifted up or having their mother play certain games with them. She commented that even the dog has to put up with a poorly thrown ball.

### **Stress**

When her husband is home, he does much of the household work during Jane's recurrent pain episodes. Jane appreciates how difficult it is for him having a wife who is irritable from chronic pain and she thinks he has been very patient.

Jane's husband is very angry about her injury because he works in an industry which places a high priority on safety and the use of lifting devices to prevent

such injuries. Even now, in a new job of just 2 days a week, she feels that her employer does not understand her occasional inability to work. This annoys her employer and causes some strain between them.

### **Effect on Professional Work**

At her new job she still has problems and can no longer undertake lengthy surgery because she suffers both immediate and prolonged neck pain. After a busy or long day at work with just consulting, she commonly gets pain for a day or two, for example, "veterinary work is not really a neck-friendly job because it involves a lot of bending and examining wriggling animals at sometimes at awkward angles." Jane says that she finds doing really routine things like examining or cleaning out ears and anal glands difficult because of the physical positions she has to take.

However the greatest dilemma for Jane is that she perceives most of her colleagues think she is exaggerating her injury. She feels a sense of guilt about appearing pulling her weight.

It seems that one moment of trying to do the right thing by both client and dog has changed the quality of Jane's life forever. As she says wistfully, "it's not just the injured person that suffers, it's the whole family,"

### **SUMMARY**

Jane was a bright young veterinarian who loved her work and received a neck injury from her work which has changed her career plans. It was her desire to protect the veterinary nurse in the first instance and a client in the second, that led her to take the weight of two heavy dogs thereby receiving a severe neck injury the first time and a severe recurrence of the injury on the second occasion. The pain she has experienced has had a major impact not only on her working life but also on her social and family life. She is unlikely to ever be able to work full-time because almost all activities require her to bend and use her neck. She feels that her colleagues believe she is exaggerating her problems and this in turn is stressful and causes her to feel guilty about not appearing to pull her weight. Her major problem is that even though x-rays indicate she has a chronic injury, it is invisible to outsiders, even educated professionals like veterinarians.

## 2 JAMES

### Introduction

Like many young veterinarians with aspirations of becoming a large animal practitioner, James ended up working with small animals. Now in his thirties, James worked as a large animal veterinarian in different states of Australia, before travelling to the UK for a couple of years to undertake locums there. He returned to Australia and worked in several small animal practices as a locum before purchasing his own small animal practice in the outer suburbs. James has been severely bitten by several dogs, was gored by a cow and has experienced considerable stress from long and unpredictable working hours. He recently married another veterinarian, has a new daughter and is a keen supporter of working with his professional association.

### Veterinary career

His first job as a veterinarian was working in a dairy practice. He has fond memories of working with cattle, for example, "*[I was] hacking around the countryside in a four-wheel drive truck equipped with two-way radio and pulling out calves.*" But according to James, it was one of those practices that had he known more, he "*would not have touched with a barge-pole*". It was poorly managed with a boss who was going through a messy divorce and who was having financial problems. James and his co-workers often did not get paid and he was stressed so when the opportunity arose to work in another rural practice interstate, he left.

In this new practice, while he enjoyed the actual work especially with cattle, he remembers the hours were so excessive that he had little time for social activities. This gradually led to his resentment about his salary compared with other young professionals. He indicated that his friends were earning more than twice what he earned for half the hours. The unpredictability of emergency callouts and long working hours also precluded him from playing sport.

After working a couple of years at this frenetic pace, James went to the UK to do locums, but he thinks now that it was mainly to give himself time to reflect on what he really wanted out of life. He recollects that it was during this time

he actually considered quitting veterinary science as a career. However, he continued using his veterinary qualifications and returned to Australia, intending to work in a different field of veterinary science. He applied for several positions with government and industry which would utilise his veterinary skills but none eventuated so he ultimately found himself back in private practice as a locum. This time however, he wanted to have some control over his working hours. During this time James became involved with the live cattle export market. The hours were much shorter and could be planned and he found this experience very rewarding. James also undertook small animal practice locums for a couple of years and eventually the opportunity arose to buy a small animal practice.

James claims that he does not particularly like animals and regards animals quite dispassionately yet he appreciates other people's affinities with their animals. James is of the view that many of these pets are "child substitutes". Nonetheless he owns a cat which he claims was a stray about to be euthanased. He explains this as having been "particularly soft" that day.

#### **Injuries - small animals**

James has had four serious dog bites plus numerous nips and scratches from both cats and dogs. He feels relatively lucky in terms of acute injuries. His first bite by a German Short Haired Pointer occurred while he was trying to restrain the dog for a colleague to anaesthetise. Without warning, it turned on him, biting him on the face and the ear. In hindsight he believes that the dog was a "fear biter" with none of the normal signs that show a dog is about to bite. He recalls the dog's dramatic change in demeanour from being quite docile to being very savage. He sought medical attention immediately and was given a tetanus injection and antibiotics. Luckily no sutures were required and he considered it was not serious enough for him to take time off work.

The second injury, a bite on the arm, was from a German Shepherd he was trying to medicate. He blames himself for attempting to treat the dog on his own. He recollects how rushed he was at the time with not enough staff to assist. He flushed out the wound with Betadine and it ultimately healed albeit with a scar.

The third attack was the worst. He had just finished injecting a German Shepherd with the assistance of a staff member but received three severe bites to his right arm as he was putting the dog back into its cage on his own. He cleaned the wounds with Betadine and got the nurses to ring the local medical centre because of the number of puncture wounds. This was also necessary if he were to make a Workers' Compensation claim. His physician told him to take two days off work, but because there was no one else available to replace him he felt he could not take the time off. In hindsight he says he should have had someone assist him put the dog back in its cage. He recollects that the nurses put the dog back in the cage without any problems and thinks that the reason they were more successful is that they were more patient than he was.

The fourth injury was from a really aggressive two year old Golden Retriever. James claims that it also gave no indication it would bite. He described the animal as the most aggressive dog he has ever handled and it gave him a severe bite on the hand. He was concerned that although it had been treated previously at the practice, staff had not recorded it as being aggressive. Immediately after the dog bit him, its owners muzzled it, indicating that "*it's a bit of a biter*" James was annoyed they had not bothered to warn him. James treated himself and again did not take time off work.

He acknowledges that while he knows how to avoid being bitten, he sometimes takes risks and guesses that probably one in ten biting dogs is going to connect.

### **Injuries – large animal**

James's only major injury from any large animal occurred when he carried out an eye ablation and dehorning on a cow. He was accompanied to the farm by a female veterinary student doing her first practicum. He said the animal was "one of those big North Western cows with huge horns".

He recalls that the facilities were substandard with the crush being halfway down the cattle race, rather than at the end. Because of the physical restrictions, James tried to do the procedure from above the cow. This proved impossible because the animal kept lowering her head. Since the problem was primarily in restraining the cow using nose grips and a halter, against his better judgement, James was forced to work in front of the cow and inside the race. The cow

lunged at him, tearing his overalls from neck to groin and ripping his underpants with its long skinny horns. He believes he was caught by the cow's horn because he had slow reflexes following a bout of influenza. He quickly put on another pair of overalls feeling embarrassed by being exposed in front of the female student. He remembers feeling really sore from what he thought was a deep graze but did not realise how severe the injury was because he was so bloody from the dehorning and eye ablation. It was only after he showered at home that he discovered he had been partially circumcised.

Being in a small country town, he found it very awkward to seek medical treatment for such an injury. He informed the medical centre receptionist that the injury involved his foreskin. Later he was told with some amusement by the receptionist that the staff were all giggling their heads off because the practice occasionally gets to suture these sort of "wanking" injuries. When he went in for treatment they were surprised to be told that the injury would be a Workers' Compensation claim and that it was caused by a cow.

### **Chronic Injuries**

In the last couple of years James has developed neck and back problems but does not recall what has caused them. Although he has evidence of arthritis in his lower neck, he participates in active sports.

According to James, his shoulders were wrenched pretty badly doing pregnancy testing in cattle which was a major influence on his quitting large animal practice. During the last pregnancy testing season, before he left rural practice, he remembers being unable to lift his left arm above his shoulder. It used to take up to two months to get better and in the meantime he was forced to use his other arm. He says he has not had his shoulder investigated but presumes it was similar to Repetitive Strain Injury (RSI), because as soon as the pregnancy testing season was over, the pain would normally disappear.

### **Stress and Safety Issues**

James's enthusiasm for working in large animal practice waned considerably when he found himself working 80 to 90 hours a week with little respite. While he initially liked being a large animal veterinarian, he preferred when it was during normal working hours. The after-hours work caused him

considerable stress because he was unable to develop any permanent relationship, play sport or plan social activities.

In his early days in veterinary practice James was stressed because he could not complete all his work during a normal day and because of emergency cases which resulted in long working hours. He remembers how stressed and angry he felt and how he internalized it with no opportunities to vent his frustrations. Eventually his level of anxiety was such that whenever the telephone rang after-hours, he felt very much on edge.

Now he finds it difficult to believe he could have sustained that level of pressure for such a length of time. He no longer does after-hours work.

James says that his practice is very strong on x-ray protocol from a safety point of view. The veterinarians sedate or anaesthetise all animals requiring x-rays. Staff are not allowed to hold animals while x-rays are being taken, and sandbags are used to steady the animal in place. Only very occasionally will an animal be held if it is too frail to be anaesthetised or if it needs to be held in a very difficult position, but the veterinarians ensure they always wear lead aprons and gloves. He feels especially sensitive about the dangers to pregnant women making it a policy that when x-rays are taken that the male veterinarians hold the animals not the nurse because he believes that all young sexually active female may be at risk from x-rays.

James is of the view that the veterinarian's state of mind is a major contributing factor to workplace injuries. Veterinarians know what they should be doing, but for various reasons, they compromise themselves by placing themselves, sometimes consciously, in vulnerable positions. This is frequently due to time pressures, lack of staff and inadequate resources.

According to James, veterinarians are invariably dealing with either a dangerous environment or dangerous animals. James says that he too consciously places himself in dangerous situations and realises that this should not occur because often the reasons are due to external factors such as low staffing levels or inadequate resources.

When asked why many veterinarians allow this situation to continue, James claimed that refusing to do a call because the facilities are not good enough is simply unheard because "*veterinarians are not quitters*". This misguided loyalty

to working as a veterinarian meant that he put up with totally unsatisfactory working conditions. James wishes that he had had a mentor to provide him with professional guidance and practical advice. For many years, he was very angry that the profession failed to help new graduates like himself cope more effectively with dangerous situations and how to deal with stress.

### **Suicide**

He knows colleagues who have committed suicide and believes that veterinarians may do this because it is a particularly stressful profession and that it is easy access to drugs which brings about a non-violent death that may be one of the contributing factors as to why veterinarians have high suicide rates. Even James recalls driving back from farm visits late at night tired and angry that he had missed an important social function. He recalls thinking how easy it would be to line up a particular gum tree and drive his car right into it.

These days, James has learned how to manage stress and how to avoid it. He does not internalize his anger any more and believes that work-wise, his life is as good as it can get. His concern about emotional well-being has led to him become involved in his professional association with a view to improving the working conditions for younger graduates. These days he selects what he wants to do and focuses on activities away from work such as competitive canoeing events where he can methodically plan for the event well ahead of time.

In his current practice, James has increased staffing levels so that there are always two veterinary nurses for every veterinarian working. These measures were taken to reduce the pressures of work and to allow staff to become more efficient and to provide a safer working environment.

James is married with a young daughter and considers that he has a good balance between work, social and family life.

### **SUMMARY**

On the surface, James appears to be typical of many veterinarians, who opt for small animal practice with regular working hours after experiencing what was to him a very frustrating time in rural practice where he felt he had little



control over his life because of the stress, excessive working hours and poor remuneration. The anomaly is that he really liked working with large animals especially cattle.

He believes that his injuries were largely his own fault because of taking short cuts due to time and stress factors and that his large animal injury which could have killed him was due to his putting up with substandard facilities.

While James obviously resented his non veterinary colleagues earning so much more money with fewer working hours, financial considerations do not seem to be the prime motivator for James to work as a veterinarian which he says is just as well since most veterinarians earn considerably less than similar professionals.

In his own practice, he ensures that veterinarians are not overworked and he has implemented practices aimed to minimise stress. While he says he has had suicidal thoughts he does seem to have been really serious about it and he now works with others to try to alleviate problems and ensure that they do not go through similar situations to what he did. He now has a more balanced approach to his social and professional lives.

## 7 JOHN

### **Introduction**

John graduated about 30 years ago and immediately started work with in a small animal practice. After a stressful situation, he moved interstate initially as an associate and then purchased that practice 25 years ago. He is married with three children.

### **Career**

His first job in a three veterinarian small animal suburban practice, he recalls as being quite stressful because his boss had unrealistic expectations about his capability and offered him little support. The boss believed that as a new graduate, John should be able to accomplish everything he could with 30 years experience. Not long after he started, the other veterinarian, a female, committed suicide by taking an overdose of barbiturates. He does not recall noticing that she was stressed but it certainly affected him and moved interstate.

After initially working in a branch practice as an Associate and developing that practice to being very profitable, John was able to purchase it. He says that it is very difficult to obtain a loan to start up a veterinary practice but it is much easier presenting a budget showing cash flow for an existing practice. John has now owned the practice for more than 25 years and regards it as quite successful. He is always concerned for the safety of his staff and when re-designing the practice buildings he made sure that there was a single floor level throughout the practice so animals could be moved with a minimum of effort. He also ensured that he had separate cat and dog waiting rooms to minimize the stress in cats especially. According to John, if the animal is not stressed, then there is less chance of it scratching or biting the veterinary staff. John works between 50 and 60 hours a week, but his practice no longer does any after-hours calls, referring all after-hours cases to the emergency hospital nearby. This has made a big difference to his quality of life.

### **Injuries - small animals**

John remembers in his early days being bitten by a dog that had been run over and he still has the scar on his neck. He recalls that he was not as cautious in

those days and did not think to muzzle it. The dog was suffering pelvic injuries and bit him on the neck. This injury required a visit to a doctor, a few sutures, a tetanus vaccine booster and antibiotics. Apart from the initial doctor's visit, John did not take any time off work.

John also recalls being bitten through the hand on at least two occasions and while he cannot remember details of one incident, he does recall how difficult it was to find a medical practice that was open to get it attended to. He ended up stitching the wound himself with no complications. On another occasion he sought medical assistance for a dog bite and it was sutured up this time by a doctor who also gave him a tetanus booster.

The most recent injury he received was a crushed thumb where a four year old Rottweiler dog, heavily sedated for an x-ray, managed to clamp its mouth on his thumb while he was checking its level of sedation. As John explained, the drugs he used to sedate the dog are highly effective but can drop the blood pressure dramatically so he was checking the dog's gums to observe capillary refill time and for cyanosis when the dog bit him. He says he did not muzzle it because there was a risk of it vomiting. He cleaned the wound with antiseptic and took some Panadol. He did not get antibiotics because he believes that if one cleans a wound very quickly with antiseptic, it will heal well. He remembers that his thumb was extremely painful and if he had not been taking holidays, he would not have been able to work at full capacity for a few days. He could still drive a car with the injured thumb but recalls that he could not move the joint for about three weeks. John explained that quite a few bites occur where one thinks the dog is heavily tranquillised or anaesthetised. But if a dog is muzzled, one is less likely to check for cyanosis.

John also still carries a scar on his arm from an excitable Red Heeler which required a nail trim. His dewclaw raked John's arm and he recalls that the wound bled a lot. He regards dog and cat bites and scratches as being a normal part of the risk of being a veterinarian. John believes that many dogs are unsuitable as pets and that all dogs and their owners should attend obedience classes so that their dogs are not only better behaved and more manageable for the veterinarian.

### **Chronic injury**

John does experience back pain that for him has resulted from lifting heavy dogs. He says he tries to examine the big dogs on the floor. One of his regular clients has trained his dog to jump on and off the examination table but in John's opinion, it is very risky for it to jump off the table. About three months earlier, he helped lift the dog down and believes he hurt his back. John recalled that his back was quite sore for a few days and did limit some of his movements.

John also remembers hurting his back a few years ago, doing renovations on his old veterinary clinic. He says that it was not really a veterinary injury but it was still occupational and caused him to be off work for a couple of days. He generally relies on rest and prescribed anti-inflammatory drugs with occasional input of a physiotherapist to return his back to normal.

Because he is self employed and not incorporated as a business, he is not personally covered under Workers Compensation however all his staff are. In order to keep his premiums as low as possible, his work disability insurance only pays out after he has been off work after 30 days.

He says his staff do experience minor injuries and may be off for short periods like half or whole days, but generally their injuries have been minor, The worst was a member of staff who suffered whiplash following a car accident on her way to work. She was off work for a month and could only work part-time for several months and that put a lot of stress on him and the other staff members. He says that while Worker's Compensation pays for employees, it does not help those staff who face extra pressure because of the prolonged absence or reduced workload of another injured staff member.

His concern about preventing injuries has led him to purchase a special lifting table in the surgery and also to carry dogs on stretchers. He recalls that in his early days in practice, he was often by himself especially after-hours. He would have to carry animals by himself, answer the telephone and juggle an anaesthetic. That was one of the reasons why he ceased after-hours work with the resultant vast improvement in his home life. He no longer jumps every time the telephone rings and thinks that he may be able to stay in practice longer in terms of years. While he has considered retirement, it will not be in the foreseeable future because his son has just started high school.

### **Assaults**

While John has not been assaulted personally, one of his nursing staff had a knife held to her throat and the offender stole the till contents but no drugs. Although not physically injured, she was quite traumatised. She had previously worked in a bank and had also been the victim of a hold-up by a violent offender. After the hold-up at John's practice, the staff member had psychological counselling which was covered under Workers' Compensation. She has since moved out of veterinary practice.

### **Thoughts on practice**

John thinks that what he was taught at University in his course, did not relate to what he saw on a daily basis when he started working and that was a deficiency in his training.

He thinks that over the years the proportion of clients who have chosen difficult or inappropriate dogs has increased and also that their inability to manage or control these dogs is a major issue. He thinks that puppy pre-schools run by veterinary practices are good because the dogs are not so restless when they come to see the vet. Most dogs that have done this program seem to actually enjoy coming to the practice. John says that most people do not realise what they are taking on with a pet in terms of control and degree of difficulty. The veterinarian ends up having to examine unruly and unmanageable dogs with low pain tolerance and which are often very hard to control. He muses that perhaps having more technical assistance might help prevent some of these injuries but that will not totally solve the problem.

### **SUMMARY**

John's first job as an Associate in a three person small animal practice was stressful because he had little support from his boss and the third veterinarian committed suicide. He moved interstate and worked as an Associate (alone) at a recently set up branch practice and ultimately bought it. Most of his injuries occurred in early days during the evenings when he was less cautious and mostly quite tired. He has been bitten a couple of times and on one occasion he sutured the tear himself when he was unable to locate doctor. John regards bites and scratches as part of the job but admits that occasionally he

careless. He tends not to muzzle dogs that he anaesthetises so he can readily check their capillary refill time in the mucous membranes of the mouth. He uses drugs like xylazine and other sedatives and occasionally these give unpredictable results such as the dog not being properly sedated.

He recently has developed low back pain from lifting a large dog off the examination table and John thinks having more support staff as support during consultations will help reduce injuries. He has installed safety equipment in the practice to try to reduce injuries.

## 10 CRAIG

### **Introduction**

Craig graduated 19 years ago initially working as an associate but then owning a mixed animal veterinary practice in rural NSW and employing an associate veterinarian. He is experienced with dogs, cats, horses, cattle and sheep. He is married with three children and spends about 60% of his time working with animals and the remainder is spread between administrative work, driving and professional development.

### **Veterinary career**

Upon graduation, Craig worked for one year in a rural practice before being employed as an Associate in a primarily cattle practice where he undertook almost all the cattle work. He did this for twelve years. Ultimately too much pregnancy testing caused him to develop major problems with his back which precluded him from continuing work as a cattle veterinarian. Because that was his primary role in the practice, he was sacked. He then set up his own veterinary practice in a small rural town and now five years later, employs an Associate. The practice mix is about 50% small and 50% large animals. He still does a small amount of pregnancy testing in cattle and some equine stud work but he can now choose what he does and how much. This has made a considerable improvement to his life.

### **Injuries - large animal**

Most of Craig's injuries have been chronic, resulting from the repetitive activities he has undertaken as a veterinarian. When employed as a cattle veterinarian, Craig's duties also included bull testing, calvings, artificial insemination and pregnancy testing large numbers of cattle.

He recollects having sore shoulders, elbows, wrists and knees on many occasions from pregnancy testing. Both shoulders were involved because while he used his left arm for pregnancy testing, his right would be used to hold the tail and work the gates. This caused considerable pressure on the shoulders especially when he was pregnancy testing 600 cows a day. Although Craig has not had his shoulders x-rayed but there is a lot of crepitus in his joints and, his wrists and elbows ache when he goes to sleep.

The major injury he sustained was to his back. He attributes this to pregnancy testing many cattle in his early working life. He believes that during the pregnancy testing season, he would average about 400 cows per day for four months but does remember on some occasions pregnancy testing more than 600 cows in a day. The first signs were just soreness of the back and he recollects lying on the floor after work to rest it. He thought it would get better in time however it did not so he finally sought medical help. His recalls the doctor looking at the x-rays and telling him that it was the worst chronic back injury he had seen on a 35 year old. The x-rays revealed chronic arthritis of all the articular surfaces which even when he moved slightly, was the cause of all his pain. The doctors told Craig they could not operate because it was a widespread condition not conducive to surgery. At first he used Panadol but then as the pain continued he graduated to Panadeine and Celebrex.

After further visits to the doctor he was told to stop pregnancy testing cattle however he felt he could not stop because he had to support his family. He recalled some time later meeting the doctor in town. The doctor was surprised he was still pregnancy testing and informed him that unless he stopped immediately, he would no longer be covered under Workers' Compensation because he had previously been told to stop. It was only then he says that he informed his boss of 11 years about his back problem and that the doctor had told him he could no longer work with cattle. His boss requested Craig see another doctor who supported his medical colleague. Craig recalls that he was then given restricted duties under Workers Compensation that mainly involved him working with small animals. This obviously was annoying to his boss who had to employ another veterinarian specifically to do the pregnancy testing and other cattle work. After five months he was dismissed with just one month's notice which his boss said he was permitted to do under Workers' Compensation law. During the five months working on restricted duties, Craig said he had been unfairly treated, losing the use of a vehicle and telephone and having his pay cut because he no longer was doing any after-hours work. He believes that his boss was trying to force him to leave of his own volition and when that did not happen, he sacked him. Craig sought legal advice and his solicitors said that he should be able to mount a case against his former boss for unfair dismissal because his back problems were attributable to



his having spent 11 years pregnancy testing in the veterinary practice. Their advice was that the boss was negligent.

However Craig had difficulty gathering evidence to substantiate the cause of his condition and was especially angry that he was unable to find any expert witnesses or colleagues willing to testify on his behalf despite many large animal veterinarians experiencing injuries similar to his. His former employer was also able to bring in someone who testified that pregnancy testing large numbers of cattle did not contribute to back or knee problems in veterinarians. Subsequently the advice from Craig's lawyers was that he might lose the case and then be responsible for paying court costs. As a result he settled the case.

### **Safety Issues**

Craig recalls that when he commenced work, he had no training on how to prevent injuries. He explained that the laws have now been changed and new graduates would not go through what he went through. He recently met some cattle veterinarians at a conference and every older veterinarian there had a chronic injury from having spent years pregnancy testing. However he says that no-one wants to stand up in court and be counted, they just change their career. Craig spoke with a 35 year old veterinarian who said he was "very sore and sorry" from his large animal experiences, especially with cattle. He now specialises in embryo transfer work so that he can reduce the pace of the work and thereby reduce his injuries. Another veterinarian had moved into merchandising and a lot of his colleagues have moved into working with small animals. Some had gone into equine practice but a few of them found that was also physically demanding.

In Craig's practice which he started in a small rural township about five years ago, he still undertakes cattle work although he wears a back brace to provide some support and a brace for his knee. He now limits pregnancy testing to about 100 cows at a time. He says because he is the boss, he is able to decide when to undertake pregnancy testing and hence can limit the physical stresses on his back, shoulders, elbows and knees.

### **Zoonotic disease**

Craig has also tested serologically positive for Q Fever but cannot recall being clinically ill with the disease. However recently a specialist suggested that the

arthritis in all his joints and especially in his back, could have resulted from having had Q Fever.

### **Stress and lifestyle issues**

Craig believes that his chronic injuries have had a major impact on his life. Life was initially great. He thought he had a great boss, he had a good income, and had married and built a house in the town. Then he began to experience back and shoulder problems as a consequence of pregnancy testing. Craig reported that he only ever wanted to work with cattle and not with other animals so, when he could no longer pregnancy test or undertake other aspects of cattle practice, he felt as though his world had collapsed. This was what led him to start his own practice so he could be empowered to do what he wanted to do. He does not like people especially clients asking him about his back and just wishes the problem would disappear.

Craig also reported pressures on family life especially in the early days, but after he started his own practice, he was able to slow down.

Craig is also very bitter about how he has been treated in the courts with his Workers' Compensation claim his case against his former boss for negligence. He resents the "medico-legal system" for insinuating that he was lying and for sending people around to try to photograph him working to prove he was lying. He knows he has a problem and wants to work. He initially treated his back problem himself, not wishing to advertise this problem however, this was held against him because the courts implied that as a health professional, he should have known better.

When asked about the level of pain he endures, he says that if ten out of ten is the worst, he thinks he experiences eight out of ten. He acknowledges that there are others with worse injuries than he has. He says that he has never been depressed or suicidal because of his problems.

### **Thoughts on rural veterinary practice**

Craig understands why it is difficult to keep veterinarians in rural practice. He pointed out an advertisement from a major pastoral company where a veterinarian was to be paid about \$35000 for pregnancy testing 40,000 cattle. He wondered whether a new graduate would really know what lies ahead with respect to injury. He thinks that this type of job turns young people away

from rural practice leaving a dearth of veterinarians in rural Australia. Craig points out that the average age of veterinarians surveyed by the Australian Association of Cattle Veterinarians (AACV) was 44 years. He was also puzzled by the results of the survey undertaken by the AACV which claimed that AACV members average 560 pregnancy tests per day and that there was no significant relationship between numbers of cows pregnancy tested per day and back injury. Craig believes they may not have considered chronic disability which is what most veterinarians his age or older suffer from. He estimates that the working life of a cattle veterinarian is only 10-15 years. Craig named three colleagues who were in large animal practice and whose injuries prevent them from continuing. He also knows of one young female veterinarian who told him she would not contemplate working in rural practice because she did not wish to experience injuries like he had.

According to Craig, there is a lot of stress in rural practice these days. Veterinarians no longer want to work as associates in the country. There is not enough money and with deregulation of several veterinary procedures, allowing non-veterinarians to conduct procedures that were once the province of veterinarians, "it is a pretty miserable time" for rural veterinarians.

## SUMMARY

Craig's major injuries have been to his back. After years of pregnancy testing up to 600 cows a day for four months at a time, he developed arthritis of all the articular surfaces in his back and in his knees and crepitus in his shoulders, elbows and wrists. He moved into doing small animals with a reduced veterinary load under Workers' Compensation but after 6 months, he was sacked. This was after he had worked eleven years as an Associate. Being sacked devastated him because cattle practice is all he has ever really wanted to do so he started his own practice where he can pregnancy test small numbers of cattle at any time without exacerbating his back problems. He has tested positive for Q Fever but has no recollection of getting the disease. A specialist thought perhaps that Q Fever may have contributed to the problems he has in all his joints but there is no proof.

He experienced considerable stress from the pain in his back, shoulders and knees but was especially stressed by his treatment by his former boss and the

courts in attributing the cause of his back problems. He never got to the stage of being depressed or feeling suicidal. Owning his own practice allows him to pace the work. He wears a back and knee brace when doing large animal veterinary work.

## 12 SIMON

### **Introduction**

Simon graduated more than twenty years ago and has worked in four states of Australia and the UK. He currently leases a mixed animal practice in a rural town not far from a major city. He has received several major injuries from large animals and had the zoonosis, Q Fever.

### **Veterinary career**

After graduation, he worked in a mixed practice in a rural town for three years before going to the UK for two years where he undertook locums in mixed animal practice. He returned to his previous job in NSW, then to Queensland for four years and then back to England for three years. He worked in four practices in Western Australia and South Australia before settling down to lease a mixed animal practice in a large rural town.

### **Injuries - small animal**

Over the years, Simon says that he has received many dog bites with most occurring when he was getting dogs out of cages. He really only remembers one in any detail which he says occurred when he was an inexperienced new graduate. He recalls it was caused by a psychotic bull terrier. He was walking the dog back to its cage, when it suddenly turned and bit him on the leg and then actually started to attack him. He managed to throw the dog out into the clinic yard, but he says it was still trying to tear off the fly screen to attack him. Simon says he had to call its owner and surprisingly, it behaved perfectly for the owner. However, some months later, he heard it attacked some children and had to be shot.

### **Injuries – large animal**

Simon recalls having had numerous injuries caused by large animals including broken toes, broken ribs, concussion twice, a dislocated elbow, a broken leg as well as numerous cuts and scratches.

On one occasion, Simon was listening to the gut sounds of a horse when it suddenly stood on his toes breaking three metatarsal bones. He went to the

local doctor who plastered his foot and he returned to work. He found it painful carrying out veterinary work but he managed.

On another occasion Simon broke several ribs when bleeding rams to test for Brucellosis. He says that the ram that charged him came over the fence and was not even in the group being bled. He recalls picking himself up and continuing with the job, albeit in considerable pain. He thought it was only severe bruising and only went to the doctor three days later when his chest was still hurting and he was having trouble breathing. The doctor diagnosed a collapsed lung and broken ribs. Simon recalls that although it was painful, it did not curtail his veterinary activities.

Simon's dislocated elbow occurred when he was doing a calving in a rotary dairy. He remembers the cow falling down while he was trying to extract the calf and he did not get his arm out fast enough. He could not use his left arm, but was still able to direct the calving with a successful outcome. Next day he recalls going to the local hospital where an orthopaedic surgeon put his elbow back in place and he was discharged in the afternoon. He says the surgeon just popped it back in and he was lucky he did not have any ligament damage.

Simon has also been concussed twice: both times when he was suturing the back legs of horses and both times he was kicked in the head by the horses' back legs. He knows that he was knocked out on at least one occasion but cannot clearly recall the details. Simon admits that this was in his early days and could be attributed to inexperience on his part. He would not consider trying to suture horses these days without first giving them a general anaesthetic. He says that he did go and see a doctor on both occasions when he was hit in the head. The first time his concussion was quite mild and he recalls the doctor telling him to take the rest of the day off work. The second time was more serious and he says that he did not realize he had a problem until later in the day when he was writing out the accounts and his staff pointed out that everything he was writing was all jumbled. He was x-rayed and diagnosed with a fractured skull. He spent that day in hospital but returned to work the next day. According to Simon, it took about 10 days before he was functioning normally although he was able to undertake physical examinations and other veterinary activities. He just was not able to write properly. When asked about the hazards of working with potentially

dangerous animals while he was still suffering concussion, Simon shrugged and said it was a matter of necessity to work.

The broken leg occurred when he was taking an x-ray of a horse. The horse kicked Simon just above his knee, breaking his leg and rupturing all the ligaments in his knee. He was unable to get to his feet and fortunately had a work experience student with him who was able to call an ambulance. He was taken to a major hospital in the city where he had two large screws put in his leg to assist with the healing. He was hospitalised for five days while he received a total knee reconstruction. While he says the injury to his leg has not impacted much on his work, he is now unable to run or play sport. He cannot put much weight on his leg or it collapses.

### **Chronic Injuries**

Apart from the broken leg and its long term consequences, Simon says he has never had shoulder or elbow problems from pregnancy testing cattle or horses. He says that he pregnancy tests only a few animals in his current practice but in previous practices, he pregnancy tested tens of thousands of cattle each year. He says the maximum number he ever tested in one day was 820 cows. He recalls that his arms used to tire so he used to swap arms but he has had no long term effects. According to Simon, pregnancy testing horses has been much harder on his arms because they have a tighter anal sphincter than cows.

### **Zoonotic disease**

Simon said he contracted Q Fever when he was worked in NSW and that it resulted from a calving case. He recalls that he became sick about 4 or 5 days after the calving and that he could not get out of bed and was sweating all the time. Simon says he felt totally fatigued and was running a very high fever. The doctor prescribed tetracyclines and he recovered in 3 or 4 days. He took a week off work and he has never had a recurrence, nor has he had post Q fatigue.

### **Stress**

Simon admits to being stressed at times which leads to irritability and a lot of things "appearing to be ridiculously monumental", but he has never experienced depression.

He has a partner with one child and three children from a previous relationship and knows that veterinary practice impacts greatly on the family.

In the past, he has often been tired and irritable much of the time and has now made a conscious decision to spend more time with his family. The present practice he leases is not as busy as some of the others he has worked in and that was a major reason why he came to the town to work. He says that he used to enjoy sport which was a great outlet for stress and also did a lot of running which he can no longer do because of his injured leg.

### **Suicide**

He knows of two colleagues in NSW, one 26 and the other 30 years old who killed themselves but is not sure why it happened. He recalls that they were both over achievers and stressed "from the word go". He thinks that perhaps veterinary practice did not live up to their expectations.

### **Safety Issues**

Simon considers that the public has little appreciation of what veterinarians do, how many hours veterinarians work and how fatiguing the work can be. He says that he has trained the clients in his current practice to be more considerate and less demanding.

Simon considers that many young veterinarians think they are going to go out and save the world and then financial factors interrupt all the things they wanted to do.

### **SUMMARY**

Simon has sustained quite a number of injuries primarily from large animals. He was mainly bitten by dogs when he was younger and inexperienced.

He has sustained broken toes from a horse, broken ribs and a collapsed lung from a ram, a dislocated elbow from calving a cow in a rotary dairy and been knocked unconscious twice, both times from being kicked in the head by horses when he was working with their hind legs. He received a broken leg when another horse kicked him while he was x-raying its back leg. All the major ligaments in the knee were ruptured and he needed a total knee



reconstruction. He has now had to limit his sporting activities and large animal work because of problems with his knee.

He has had Q Fever and suffers stress from working as a veterinarian. He now tries to balance family and work commitments.

## 14 LYNETTE

### **Introduction**

Lynette is a 42 year old female veterinarian who worked for 12 years in a mixed practice and then at two abattoirs for two years. She now teaches veterinary nurses at TAFE.

### **Veterinary career**

Upon graduation Lynette took a position in a mixed animal practice, working for a veterinarian who owned several rural practices. Having formerly worked as a veterinary nurse while studying to be a veterinarian, she wanted to be able to work on her own and not have to take orders. However, after about ten years, she could no longer tolerate the poor working conditions, lack of support, stress and poor pay in the practice and resigned. As she had recently married she set up her own veterinary practice on her husband's family farm while her husband developed a piggery with his brother. Lynette also had two children; the first was born 12 months after she married and the second 21 months after the first. She also had a still born baby. She worked throughout all three pregnancies, only taking time off to have her children in the regional hospital.

Lynette bought quite a lot of equipment, and thinks that perhaps she over-capitalized. Nonetheless she built the practice up so that she was working between 40 and 60 hours a week depending on the season. Two years later, the piggery ran into financial problems because of the high cost of grain and the drought so Lynette and her husband moved to the city to obtain employment and build their own home. She recouped some of her capital costs by selling the equipment and then undertook locums around the city although many potential employers felt uncomfortable in employing her because she had already owned her own practice. They did not want to pay her at a rate commensurate with her skill and experience, nor did they want to give her the scope to do procedures and treatments her own way despite ten years' experience. She recalls at this time losing a lot of confidence in her clinical skills. Eventually she had two jobs working two days a week in each of two adjacent mixed animal practices. Lynette feels that she has considerable experience and a lot of success with her cases however she had some

philosophical differences with one of her employers regarding her approach to treatment and she left that practice.

Lynette then applied to become a part-time government veterinarian working for the Australian Quarantine Inspection Service (AQIS) at an export abattoir not far from her home. She says she found the job quite stressful because of management which wanted her to “turn a blind eye to what was going on” such as not following protocol or allowing meat to be passed that should have been downgraded and thus would not be acceptable in European countries. She said they tried to intimidate her using “standover tactics,” however she believed that she had the support of AQIS.

Lynette then applied for a permanent position in the service at another abattoir. In this role she helped establish a niche abattoir for slaughtering multiple species ranging from goats and ostriches through to cattle and camels. Unfortunately Lynette found the same management pressures wanting her “to turn a blind eye” to some of the practices they were doing. Although this time, she felt that she did not have the support of her AQIS seniors. She resigned and now works in a TAFE college teaching veterinary nurses.

#### **Injuries - small animal**

She recalls being badly scratched by a Balinese cat at her first practice. This resulted in massive scratches down both her arms and caused swollen hands. However she did not require any suturing and treated the lacerations herself.

#### **Injuries - large animal**

When Lynette was an employed veterinarian, she had two car accidents that she admits were her fault because she was fatigued. Once her car had veered to the opposite side and was hit by an on-coming car. She suffered severe bruising and had a sore neck for a few weeks. She did not take any time off and, therefore, was not eligible for Worker’s Compensation. In her second car accident she ran into a tree. At the time of both accidents she says she was working 90-120 hours a week. She says she knows of some veterinary colleagues in Northern Australia who have had up to ten car accidents.

Lynette received two major injuries when she was running her own practice, both of them due to carelessness on the farmer’s part and both occurring while she was pregnancy testing. The first involved a cow being sent down the race

while she was finishing off another cow and she was crushed between the two animals. The second cow also charged at her resulting in severe bruising to her ribs. Again, there was no time taken off work.

The second injury occurred because a farmer let the cow into the race before Lynette was out of the way and Lynette was too slow. There was gap in the race to escape but Lynette recalls that she had to jump upwards but the cow charged at her legs. At first she thought she had broken both ankles and subsequently she realised she had ruptured ligaments and tendons. She was unable to walk properly for about 10 weeks. Although she was able to consult and carry out surgical procedures like spays on small animals she says, she was very limited with doing large animal calls. She remembers doing some phone consultations with farmers as a result.

Lynette also recalls receiving cuts from knives at the abattoirs, but nothing serious and certainly nothing that prevented her from working. She also recounted quite a few injuries at the abattoir where slaughtermen have dropped their knives onto someone or because they are working so fast and in such close proximity that it is easy to cut someone.

### **Chronic injuries**

Lynette says that pregnancy testing was not too onerous. In the branch practice and also in her own practice, pregnancy testing was mainly done over a two and a half to three month period. She recalls that some weeks she would pregnancy test 1500 cows and some weeks just 30. She said she has had no problems with her shoulders and elbows because she thinks her height is ideal for pregnancy testing and when her arm became tired, she was able to swap arms. She adds that she mainly pregnancy tests with the left arm as she was taught.

### **Zoonotic and other disease**

Lynette has vivid recollection of the time she held a bull's head up in a dam to prevent it from drowning. She knows she was under severe stress at the time and because of her prolonged exposure to the cold and wet and she assumes her immune system was low, and a couple of days later she developed acute pneumonia. At the time she rang her employer to request a locum to cover her while she was ill. She also she put in a Workers' Compensation claim form in.

Lynette's employer procrastinated about the locum for a week or two and she continued to work because of her over-riding obligation to farmers and their animals. She finally recovered despite not having taken time off work and not having any replacement. Finally her employer sent her the Workers' Compensation claim form for her one week of illness. She wrote "No time was taken off" and returned the form. She also had difficulty in getting her employer to pay her medical expenses which he finally paid but only under duress. Not long after she resigned.

Lynette acknowledges that she really has not had any zoonotic diseases however she regards the pneumonia she had as an occupational disease. She was grateful she did not get *Aspergillus*, a major respiratory zoonosis, from the ostriches at the abattoirs she worked at.

### **Pregnancy and work**

She says that she had major problems with all three pregnancies resulting from eclampsia, pre-eclampsia, intermittent blood pressure and swollen legs. Nonetheless she worked through to when the babies were born and then again within a week of their births.

### **Stress**

Stress has been a major component in Lynette's health and well-being. Lynette felt exploited and vulnerable when she was running the branch practice. She was always fatigued and she received minimal salary. Moreover she received no additional pay when she did after-hours work and wonders now why she put up with it for so long and admits that her tenacity may have been due to her obligation to the farmers in the region, because they were suffering too.

### **Suicide**

When asked whether she had ever contemplated suicide, Lynette said that she had not considered it seriously because she had a lot more to live for. Furthermore, her employer "was not worth killing myself for". She now knows what it was like to work for veterinarians like him and understands that younger less mature veterinarians might not be able to cope. She knows of two veterinarians who have suicided using barbiturates.

According to Lynette, a major pressure for veterinarians can be the actual job. She believes that some clients do not even consider veterinarians as professionals but as a costly nuisance who is only called to perform a miracle or last rites. Lynette thinks that this view of veterinarians might be a major precursor to suicide as "it gets one down" and some veterinarians would not know how to manage it. She also believes that some new rural veterinary practices will have major financial difficulties especially if they have a lot of infrastructure possibly on hire purchase. They may also have personal issues such as the amount of time they spend with their family.

### **Safety and lifestyle issues**

Lynette considers that one way rural practitioners can survive is to get out there and do a lot more preventive medicine. She believes that veterinarians must import new technologies and adopt new ways of approaching veterinary medicine. For example, in remote areas, farmers could be issued with a box of numbered drugs. They could consult the veterinarian who would be able to tell them what to do including which drugs to use from their kit. She says there are a lot of capable and skilled people out there, for instance, "some farmers can deliver a calf a hell of a lot better than I can," however they do not have access to the drugs and the support. She recounted trying this with one farmer whom she trusts and it saved him a lot of money. In one season, the farmer had more live calves on the ground and had five more cows that were able to breed and a saving of \$2500 in veterinary costs. She recalls that she still made a reasonable income from him through supportive phone consultations, the drug kit that he had bought off her and the fact that he called her early so if there was a real problem such as a cow requiring a caesarian, she was generally able to get there much earlier and deliver a live calf. Unfortunately when the drought hit, this farmer had to sell all his cattle and the experiment ended. Another solution that Lynette suggests is to use nurse practitioners who could dispense drugs. Such a suggestion was given a very cold reception by some of her older colleagues.

Lynette believes that the farming community and veterinarians as a group need to step back and review the whole. To sustain a practice in the traditional way is not in the long term, cost effective. Locums in particular are hard to find and they would often refuse to undertake out of hours work. Lynette

found that if she wanted to attend a conference, it was more cost effective for her to close the practice for a week. She also used to refer the farmers to neighbouring practices this could mean traveling long distances if they required help.

Lynette does not regret having become a veterinarian but she would never go back into veterinary practice again because she has lost heart in working as a rural practitioner. She still feels passionate about rural veterinary medicine because she thinks it can be improved. Rural veterinary practice, Lynette believes, is affected by perceived attitudes in the community and within the veterinary profession and a lot of "old sacred cows" need to be discarded and a few people need to be convinced that sticking to the old traditional way of doing veterinary medicine in rural and remote areas no longer work. Lynette considers that is why veterinarians are burnt out, get injured or commit suicide. Veterinarians in rural and remote areas she says, must stop doing "fire brigade medicine" because this results in long working hours. A downturn in the rural economy flows on to all support businesses and one of the worst affected is the veterinary practice. She notes with disappointment that veterinarians in rural areas are mainly older because young veterinarians, even if they start their careers in the country, only last for 12 months to two years and, then go back to the city where they have much better working conditions.

## SUMMARY

Lynette has received several dog bites and cat scratches however her major injuries are from large animals. She received crushed ribs and ruptured ligaments in both ankles both due to farmers unexpectedly sending cattle down the race while she was working on animals in the crush. The latter injury had her hobbling for ten weeks limiting her veterinary work although she did not have time off work. She also had two car accidents both of which were due to her fatigue.

After starting her own practice, Lynette found herself in financial problems when drought hit the region and also because of overcapitalizing on facilities and equipment.

Lynette has experienced considerable stress when working as an associate when she was working very long hours and she became quite fatigued. Her employer was not very supportive so she quit and started her own practice. When there was a downturn in the rural economy she experienced stress from the financial strain. Lynette and her husband had to move to the city for work. Lynette worked for the government undertaking meat inspection for an export abattoir but found the job quite stressful because of some of the management practices and moved to another abattoir where she helped set up a niche abattoir for slaughtering multiple species. Unfortunately Lynette had management pressures wanting her "to turn a blind eye" to illegal practices. She left that job because she felt she did not have the support of her seniors and now works in a TAFE teaching veterinary nurses.



## 24 DOMINIC

### **Introduction**

Dominic is a 53 year old veterinarian who has worked in large animal or mixed practice since graduating from Veterinary School more than 30 years ago. He worked in two practices before becoming an Associate in a practice he was able to purchase a year later. He initially ran the practice alone, but later employed up to four veterinarians. Dominic has recently sold the practice to pursue his lifelong interest of running a beef cattle farm and a consultancy in beef cattle farm management. He is married with three adult children.

### **Veterinary career**

Upon graduation Dominic worked for several months with an equine practitioner and then for several months with an older veterinarian running a mixed practice. From there he went to another mixed practice for two years loving the work. Still wishing to be a farmer, he bought some land in a beef/sheep area and went into partnership with another veterinarian who had established a veterinary practice three years earlier in the district. A year later he became sole owner when his partner left to join the government service. The practice expanded and Dominic employed three additional veterinarians at times dropping back to just himself because of drought. Dominic was a "one man band" working excessive hours for five years before taking on associates. The town was also getting bigger and its demographics were changing. When Dominic first started, 85% of the workload was cattle with a few horses and a few farm dogs. As it changed there was more horse work and cattle work constituted only 50%, with about 35% small animals. Because of his love of cattle, Dominic did all the cattle work and half the horse work, while his assistants mainly did the small animals and the remaining horse work. He recently sold his practice because he now wants to spend more time with his wife and run his farm using consultancy work to maintain his income.

### **Injuries – large animal**

Dominic's first big injury occurred as an associate having been graduated for less than two years. He was helping a farmer castrate calves. The farmer was holding the calves while Dominic cut them. The farmer wanted to learn how

to do the castration, however as he was about to castrate his first calf, a cow kicked out and the farmer drove the scalpel straight through Dominic's left forearm. The radial nerve, all the tendons and blood vessels were severed. Dominic realised this immediately as his hand went numb and blood was spurting everywhere. He grabbed some haemostats and clamped off the arteries and went straight to the regional hospital where the doctors immediately sent him off to a plastic surgery unit in a major city hospital where the surgeons joined all the tendons and attempted to join up the nerves. After this, Dominic's arm was in plaster for about 14 weeks and he was paid through Workers Compensation during that time. Dominic got back reasonable use of his hand after about 12 months, but has never developed any sensory perception in his hand and even now has reduced sensation in the hand. For example, he cannot feel a cigarette burn on the palm but does have some feeling on the back of his hand. As a result of this injury, he has had to swap arms when pregnancy testing because of the lack of sensation which would hinder his diagnosis.

After three months off work Dominic returned doing light duties for a few months and then went back to working with large animals. Initially he could only work with his right hand although the left hand was just usable. As he says, while he could do macro activities like holding forceps with his left hand, micro activities such as fine surgery were beyond him. He even adjusted his techniques so that he could manage caesareans one handed. Over the years Dominic's hand progressively got better but he has developed Dupuytren's Contracture which affects tendons in the palm of the hand and causes the fingers to contract. The pathology of the condition is not known but it is familial and Dominic eventually will have to have surgery. Dominic received \$6000 as a Workers' Compensation payout for the injury but only after it took a three years for court settlement. Dominic reflects now that at the time the injury did not worry him very much, because in the early days of veterinary practice, veterinarians took such injuries in their stride.

Dominic's next injury was being knocked unconscious and receiving a fractured jaw from a difficult horse he was pregnancy testing. She was in a race and kicked out backwards out over the rail hitting him under the jaw, breaking the symphysis. He has no clear recall of the event because he woke

up in hospital. The fracture healed uneventfully and apart from the half day in hospital, he did not take any time off work.

Another time, Dominic was pregnancy testing a Clydesdale mare, a wild one, and she reared straight up and falling backwards, crushed him. Dominic considers he was lucky to escape because he was underneath the horse which was jammed upside down in the race and starting to kick upwards. Fortunately he was pulled free. He had several broken ribs and a cracked sternum and in spite of being badly bruised and sore, did not have time off work. This occurred about 20 years ago.

On another occasion he was drenching a horse when it kicked him with its front leg. It knocked him onto his back, stomped on his face and continued down to crush his foot. Dominic also recalls receiving broken ribs several times especially when working with big mobs of cattle and with no facilities. He was often knocked over by cattle or rampaging bulls.

Dominic claimed that if he were asked to do the same things today he would say "Look, the yards are not adequate," or "the facilities are not adequate. I will come back when you have fixed them up." When he started in the practice, there were no veterinarians in the region and farmers did not have proper cattle yards. He estimates that about 70% of all the calvings the practice did (which was 15 to 20 calvings a day), would involve lassoing the cow and tying her to the bull bar. He says in those days he would have done at least one caesarian every day with a wild horned cow tied to his vehicle. Dominic recalled that if the veterinarian refused to work under such conditions they were regarded as "pussies". These days he would never expect the people he employed to work under such conditions.

### **Chronic injury**

Dominic says he is probably the perfect type for pregnancy testing. For example, "I am built like a brick shithouse". He is of average height but strong in the shoulders and consequently he says he had very few problems when pregnancy testing large numbers of cattle. However, in the last five years he sometimes gets sore knees after pregnancy testing and the soreness goes away if he does not pregnancy test for a while. His right knee especially gets quite stiff which he puts down to the lateral pushing as he pregnancy tests. Dominic

has never had a "frozen shoulder" as some veterinarians have, but occasionally he will get teno-synovitis in the acromium-clavicular joint. He takes phenylbutazone for this.

#### **Zoonotic and other disease.**

Dominic remembers getting Brucellosis quite early in his Veterinary career. He says he owned the practice at that stage and he was doing a lot of Strain 19 vaccinations. He was running the practice on his own was working long hours, leaving home at 5 in the morning and coming home at 10 or 11 pm, 6 and 7 days a week. He says he was working about 100 hours a week at the time. He noticed how tired he was and went to the doctor who said it was just overwork. He recalls attending an Agriculture Department seminar and talking to a colleague about his fatigue and that for the first time in his life realized he was experiencing severe mental depression. Dominic recalls that life was almost at the stage where it would have been easier to go out and shoot himself. He felt he just could not keep going. His colleague told him that a major cause of depression in farmers was Brucellosis and that most likely that was what he had. Dominic took a blood sample himself and sent it to his colleague who told him that his serology titre for Brucellosis was extremely high. By now he was aching all over and had a high temperature so he went to the doctor who knew nothing about the disease, but on Dominic's suggestion, sent off a blood sample to check on his titre and the diagnosis was subsequently confirmed. He recalls that this all probably occurred over a 6 or 8 week period. He says at the time he had just thought he was weak and would toughen up. He was eventually put in hospital for about four days on a drip and given very high doses of the antibiotic Doxycycline for two or three weeks. As a consequence of the treatment he developed severe photosensitisation and diarrhoea for about a month. When he had recovered he found he was able to work the long hours he previously had

About twenty years ago, Dominic also contracted Q Fever. He was carrying out a caesarian on a Simmental cow that had just come from Queensland, an embryo transfer cow. The calf was not breathing when it was born and because such calves are very valuable, he gave it mouth to mouth resuscitation and got it breathing again. In those days that veterinarians did a lot of mouth to mouth resuscitation to revive calves Three days later he felt terribly ill and within a

few hours had a temperature close to 41°C so his wife took him to hospital where he was bathed in alcohol for about two hours to reduce his temperature . He was put on tetracyclines and was in hospital for a couple of days. At first the doctors did not know what he had and then Q Fever was diagnosed from a blood titre. Dominic has not had any post Q Fever problems like chronic fatigue.

As discussed previously, Dominic has developed Dupuytren's Contracture which affects the tendons in the palm of the hand and causes his fingers to contract. While familial, he regards it as having resulted from the injury to his tendons following the cut he received to all the tendons in his forearm.

### **Stress**

In retrospect Dominic thinks that he probably was stressed when he was working extremely long hours and there were times when he was quite irritable at work and at home. In general, he does not see himself as a stressed out person, "That was what the job was and that was what you did in those days."

Apart from the severe depression attributed to Brucellosis, Dominic has never again felt stressed or depressed or contemplated suicide, although he does acknowledge that stress is probably a major cause of suicide among veterinarians.

Of the 15 or 20 new graduates he has employed, all seemed to enjoy working in the town for the first two, three or even four years. At first they loved the lifestyle but eventually were disillusioned probably because of the hard dirty work, the after-hours work and the salary. He also noticed that quite a few of his staff became socially isolated in the town which has a population of around 2000.

### **Safety and lifestyle issues**

Dominic noted that not only is his practice a great employer of new graduates, it is also a major training practice for veterinary students. In general the students coming through are quite good, especially the current students but sometimes they lack confidence, but there has also been a period where he found the students so ultra conservative, so city orientated that he could not relate to them. Dominic recalls that when he graduated, students were quite

laid back and more confident about their abilities. He believes that a change in the veterinary course has meant a larger focus on large animal medicine and, although there are still a lot of students who want to be small animal practitioners, there are a few students coming through now who want to be "cow vets."

One of the real issues has been the gender change. When Dominic studied there were about 45 males and 5 females in his year. Now it is the reverse. While he is happy to employ female veterinarians, he has observed that they cannot always take "the long hard physical grind" and are not capable of doing all the things his peers did when they first graduated which upon reflection was probably wrong anyway.

Dominic talks nostalgically of pregnancy testing day after day, of calvings which involved considerable physical strength and all the wild cattle he had to deal with in unsuitable conditions. He thinks now that those sorts of practices are over and recalled that when he sold his practice, he gave the new owner a list of clients who had sub standard facilities. He had written to these clients and told them from a safety point of view, that until they fixed up their yards, they would not get any veterinary services. Dominic wishes he had done this years ago and admits that sometimes there were hazards for students when working under such conditions. He recalls how he was able to rope hundreds of unhandled horses and cast them for castrations while most of his new associates, being city raised, did not have animal handling skills. As a result, placing such people into dangerous environments with poor facilities was too great an occupational risk. So he had to tell farmers that until the horses had been taught to lead and tie up, his practice would not be able to castrate colts. Only then were his associates able to carry out castrations in relative safety while he castrated all the "bandits"- the unhandled and difficult colts.

Dominic now sees that if a new graduate has a big work load, and was not making much money, they could easily become very disillusioned. He considers that the whole work ethic has changed over the last four or five years. Prior to that it was start early and finish late and a lot of after-hours calls and work hard but "that's becoming a thing of the past because people's expectations are becoming very different. New veterinary graduates want to have a life and their job is to fund their lifestyle".

Dominic says he has enjoyed being a veterinarian and loved the hard work and the challenges. However, in retrospect he thinks he was wrong to work so hard doing the one thing; he should have changed direction earlier.

#### SUMMARY

Dominic has been knocked unconscious by horses on at least three occasions sustaining a fractured jaw the first time, broken ribs and sternum on the second occasion and a crushed foot the third time. He has sustained broken ribs several times from rampaging cows and bulls while working in very poor facilities. He says he probably would not work under the same conditions in inadequate facilities these days.

His worst injury occurred when he was castrating calves and tried to show the farmer how to cut them. The farmer sliced through Dominic's radial nerve, tendons and arteries which resulted in a hospital stay, much surgery and loss of work. He now has a permanent problem with his hand contracted with Dupuytren's Contracture.

Dominic has also had Brucellosis and Q Fever, the latter from having tried to revive a new borne calf. He was severely depressed when he had Brucellosis however is rarely stressed in his professional or social life.

## 27 JESSICA

### **Introduction**

Jessica is a young female single veterinarian who graduated 2.5 years ago from University and has worked as an Associate for the past two years in a multiple veterinarian small animal practice. She works more than 40 hours a week.

### **Veterinary career**

Jessica says she has always loved animals and believes that humans and animals have a special bond. She grew up with a medical background. Her father is a medical doctor and her mother a nurse. Jessica recalls that she decided to become a veterinarian some time in primary school and, being an able student, she had no trouble getting into veterinary science, graduating with second class honours.

Jessica already had a job before she graduated. She had two job offers but took the one closer to home. She describes it as a small animal practice with 5 veterinarians.

### **Injuries – small animal**

Jessica feels that it is common to get scratched by cats and she was even scratched in the last week. It was not a bad injury and was to be expected because cats are often scared and lash out.

On one occasion, Jessica was examining an Alaskan Malamute which she has known since it was a pup. It had been brought in for its annual vaccination. Jessica says she prefers to leave large breed dogs on the floor as most of them cope better and so she does not have to lift them up into a position where they would be taller than her. It growled so she vaccinated its littermate first and went back to vaccinate it. She rolled it over to pat its belly when it lunged at her head. The dog's top jaw clamped her forehead and its bottom jaw penetrated her mouth. Both she and the owners were stunned, however the owners later admitted that the dog had been causing them some problems with growling but it had never attacked anyone. Jessica did not seek medical assistance despite the fact that she was bleeding from her gums. She finished the vaccination with a muzzle and two people holding the dog. She had a



bruise on her head for a couple of weeks. She did not report the injury for Workers Compensation purposes.

Jessica has also had an injury to her right wrist which she thinks occurred when she skidded on the ground when chasing a dog. She did not treat or report the injury. Jessica is quite small and slightly built, being only 160 cm tall and weighing 45 kilograms. She used to lift dogs up to 20 kilos in weight which she thinks she probably should not have done, but thought that she was as "tough" as anyone else. This activity placed a lot of strain on her wrist and stretched a tendon. As a result, she then had to wear a brace which hampered her from doing surgery, so despite being told that she had to wear it all the time, she took it off when doing surgery. This injury has affected her work because she had difficulty lifting dogs and in suturing with it and now it sometimes gets sore. Jessica then found that her other wrist also became sore because she used it to take most of the weight. The injury was never reported through Workers' Compensation, but has improved although occasionally causes her concern. Nowadays it is not just big dogs, but sometimes small wriggly dogs aggravate her injury.

### **Stress**

Jessica finds that being a new graduate can be very stressful. She says she knows she is not a very confident person and also looks very young and says someone first meeting her probably thinks she is around 18 years old. She recalls that when she first started she was often mistaken for the nurse or even a student on work experience. As a result it was really hard to come across as confident. This was stressful. Jessica recalls another new graduate who was quite tall and confident, and clients seemingly trusted him more which she found distressing.

Jessica recalls waking up during the night thinking about what she had done wrong or what should have done better and admits to occasionally crying. She also used to become depressed. Clients complaining about her contributed to her stress. For example, she had an aging dog that was brought in with what she diagnosed as congestive heart failure, but the clients did not believe her, saying there was nothing wrong with the dog and declining all treatment. When the dog died, they were upset. Subsequently the clients deliberately come into the hospital to gesticulate and shout at her. While her boss claims to

be supportive, he has failed to discipline the clients, most likely because of the possible loss of business.

A second incident involved dogs that had been bushwalking with their owners and were covered with ticks. Although not yet paralysed, one dog was vomiting so she gave them the option of treating for tick paralysis, which they decided to do. Afterwards, when the dogs were better and the client received the bill, the clients claimed that they had not wanted the treatment and were not given the option. She reflects that now she is more experienced and could have waited another day before treating the dogs.

A third case occurred when Jessica was working after hours. She was not able to collect a blood sample from a cat. There was no nurse present and the client who was a veterinary student attempted to hold the cat. Jessica assessed that the cat was not too sick but very stressed by the attempts to draw blood and suggested that the client take it back to her usual veterinarian. The next day the client complained that Jessica hadn't cared about the cat. Jessica was told that she should have called on another veterinarian for assistance, however at the time, there was no backup and she had to deal with it on her own. Now there is a backup plan, so if a veterinarian on duty needs help, there is someone to call such as a nurse. Also, they no longer do after-hours work, relying on clients to use a centralized Emergency Clinic.

Jessica recalls she had more support when she first started and believes that her employer has changed his style of management. At the time of the interview Jessica was very stressed about this. The most senior veterinarian in the practice has left and there were no experienced veterinarians left. The boss also brought in a Business Manager who was focused on profits. Jessica noticed a change in the boss's attitude and became annoyed with him when he told to trust her instinct about cases when she believed the diagnosis should be approached in a logical manner.

Jessica is not the only one who is stressed. There is also a new graduate at the practice who seemed to be struggling and needed help from the boss. This graduate outwardly coped by "being a bloke" but admitted that although he was coping better he would probably leave. She felt sorry for him being in his first year of work and having never had the support of a senior veterinarian.

Jessica has never contemplated suicide nor, does she know of anyone who had. She sees herself as being highly-strung and the most stressed of all four veterinarians in the practice. If there were more support from experienced veterinarians, she thought she would not be so stressed. She says that some people, particularly females, need more support than others and sometimes senior veterinarians do not understand this. The females in the practice are more stressed than the males, seek more approval from the boss and want more back up.

Jessica believes her course did not teach her how to cope with running a practice. She believes that she lacked the practical skills such as dealing with clients and life and death situations when dealing with animals. In veterinary school, it was all theoretical and they did not get to deal with clients on their own and did not deal with money. Jessica becomes stressed when clients complain about the account; she cannot give them a discount because none of the staff can alter the computerised prices.

#### **Safety and lifestyle issues**

According to Jessica, the support that the boss gave his new graduates was declining. He started leaving the new graduates with only three months experience, to manage the practice which Jessica found very stressful. Although the boss could be reached on his mobile phone, he was unavailable most times. A client had brought in a cat with respiratory problems. X-rays revealed a pleural effusion and the cat required a chest drain. Never having done this procedure, Jessica rang her boss for assistance but he said that he was too busy shopping and that he hadn't done such a procedure himself for six months. After discussion with the client, it was agreed to euthanase the cat. Other staff had indicated to her that the boss has refused to help them out and that he deliberately did this to see if they could cope.

Jessica said that the staff are being paid less than the APESMA Award and certainly after-hours did not follow the Award. The after-hours work was shared among 6 different practices in the region. Jessica's practice was on call once every 3 weeks and the work was shared among the 4 veterinarians. While they were on-call they only were paid if they actually saw a client. The boss claimed that he couldn't afford to give the staff a pay rise, but Jessica pointed out that he had just purchased two new practices! She saw standards

deteriorating with equipment not being repaired and morale very low. Jessica thought that she might soon reach the point where she felt too stressed and leave.

Jessica said that at times she had been stressed and had tried calling the Doctors' Hotline advertised by the Australian Veterinary Association for veterinarians in distress. All she got was an answering machine that told her to go to the Emergency Department of a hospital if it was urgent. However she indicated she had veterinary friends and non-veterinary friends who were supportive and they talked her through everything when she was stressed.

Jessica thought that her undergraduate course did not allow her much exposure to clients because she was the quietest in the group. Others talked over her and the clients treated them all like veterinary students. When undertaking clinical practice, many veterinarians did not allow the students to talk with the client alone. She was always introduced as the veterinary student and did not face the realities until she graduated.

Jessica, who comes from a Chinese background, is hesitant to acknowledge that some of her problems may have resulted from racism. After two years, her situation is slightly better in terms of respect. The clients now know who she is however she believes that being Asian, short, female and looking very young, is probably about the worst combination for inducing stress in a new graduate.

## SUMMARY

A recent graduate, Jessica has already sustained a couple of injuries. She regards cat bites and scratches as commonplace and, as a veterinary practitioner, expects these. She has a chronic injury to her wrist that she initially obtained when she slipped on the floor. Lifting heavy animals onto the consultation table has exacerbated this injury and she now wears a brace for protection. She was severely bitten by what she considered was a friendly Alaskan Malamute which sprang on her when she went to pat it. It clamped its jaws around her head and mouth, causing her gums to bleed and left a large bruise on her head. Jessica lacks confidence and does not feel she has the total support of her boss.

## 28 JACK

### Introduction

Jack is a large animal practitioner who graduated 25 years ago. He is married to a Physiotherapist who helps in running his veterinary practice. They have three children. With an agricultural and farming background, he was a mature age student when doing veterinary science. He has worked in dairy and mixed animal practices since graduation and now owns a large multi-veterinarian practice.

### Why Veterinary Science?

Jack clearly remembers that he always wanted to be a farmer. He always worked on the farm and it was his *raison d'être*. After leaving secondary school and completing a Diploma of Agricultural Science, he came home to work on the farm. He married and had his first child but gradually realised that because he was from a large family there was little possibility of him buying into the family farm and little chance of every buying a farm of his own. First, he worked at an Agricultural College as an Animal Science instructor, which he really enjoyed. He recalls working alongside veterinarians and finally decided he would try to get into veterinary science as a mature age student.

Because the University was unsure that his Diploma marks were adequate to do a veterinary science course, he was asked to do first year science and then compete for a place at the end of first year. He was given leave of absence from his job at the Agricultural College and was able to obtain a tertiary study allowance. He and his wife and two children moved interstate while he undertook the first year of the science degree. His wife was able to work half time and help support the family while he studied. They purchased a house with the help of his wife's parents once he had gained admission into the second year of the veterinary course. He recalls how hard he worked to gain entry because he knew that he had to catch up on basic studies. Jack says there were two other successful applicants who had done an Agricultural Diploma and the three of them had a huge amount of fun together. Jack recalls that every minute of his time as a student was exhilarating: he was grateful for the opportunity to study veterinary science and a wonderful learning environment. In his final year he wrote to numerous practices looking for a

position and had about five interviews. He finally took a job in a predominantly dairy practice close to the coast.

### **Veterinary career**

Jack stayed in that dairy practice for two and a half years and then considered buying into another veterinary practice with two sites not far away. He worked at one practice and his partner worked at the other with the assistance of a veterinary nurse in each practice. Jack recalls that those were the days where veterinarians ran around putting out fires. They did little planning for provision and certainly did not plan leisure time. He still remembers being on call on his own and only one veterinarian looking after the large animals between two large country towns was doing 60 and 70 consultations a day including farm calls, and small animal clinics in both towns. The previous veterinarians had done the same no matter how long it took. He thinks now that he was still euphoric about having his own business and its incredible potential. When he and his wife had bought the practice, they planned to employ more staff to build up the service, however, Jack's partner did not want to expand yet, so Jack's first year was very intensive and involved working very long hours. Nonetheless, he recalls really loving what he was doing.

Around this time, Jack reflected on the way the practice was operating and decided to change because the actual quality of veterinary work was not good: the two partners were "running from one bush fire to another" and not providing quality service. After three years, his partner decided to move to the city, so Jack bought him out and immediately employed three more veterinarians. Jack's partner was highly efficient and worked very hard and he would need to be replaced with two veterinarians. The additional veterinarian was employed with a view to increased work. At the time, the practice case load mix was probably 80% cattle work and 20% small animals. Jack also spent money on improving the clinics because he could see that there was great room for expansion. The practice then started doing herd health work. Thereafter the practice and its clinics kept growing and they ultimately had ten veterinarians. Jack considered that there was potential for undertaking production medicine and they had gradually moved into that field. The present situation means fewer work hours and rostered days off. He attributes a lot of the success of the practice to his veterinarians. The staff meet regularly

and all decisions are the result of teamwork and consensus and thus they have developed a sharing culture. For a while the practice even had profit sharing for all veterinarians including non-partners, however this was discontinued because the associates believed it created unhealthy competition for the higher paying jobs.

Jack and his wife, as owners of the practice, believe that their staff have been their best resource and consequently they tried to ensure optimal working conditions. Jack acknowledges that there were instances where a new graduate would have difficulties with a case, but they could call for assistance and there would always be someone to help. People have never felt on their own. Each one of the veterinarians Jack has employed remains a good friend.

### **Injuries –large animal**

Jack recalls that he really only had one severe injury which occurred when he was pregnancy testing Angus heifers for an elderly farmer. The farmer had forgotten to close the gate leading into the race and one of the heifers saw what she thought was an open space and came up the race, up over Jack and the other cow being tested. Jack was knocked over and quite bruised. He took the next day off because his back was very sore, but he did not need to see a doctor and instead rested and took aspirin. Jack acknowledged having a back problem since he was seventeen and this episode exacerbated it.

Jack has received numerous kicks mainly from cows. He recalls being kicked in the abdomen by a calving cow in a herringbone shed. The animal had enough room to step forward and kick back under the rail hitting Jack in the solar plexus and completely winding him. Another cow in a similar designed dairy also kicked him giving him a corked thigh.

On a couple of occasions Jack has been worried about needlestick injuries. Once he was vaccinating an animal and it moved unexpectedly and he jabbed himself. In another incident, the needle landed in a client's foot. She was a nurse and she teases him about the incident. She did not have any after effects.

Jack has also experienced some dangerous situations working in rotary dairies, which are very dangerous for pregnancy testing. The veterinarian stands behind the cattle on a platform, and has to manage this incredible rail that goes

around the rotary. Cows will sometimes slip and fall and it would be easy to break an arm if it were in the cow when she fell.

According to this veterinarian, bites and scratches are everyday possibilities in the clinic. In his early days, Jack was bitten several times, but with experience, he is more aware of an animal's likelihood to be vicious. He has been bitten by dogs a couple of times on the hand and several times by cats and it has usually been because he was not concentrating. He has no problems with muzzling dogs and sometimes upsets clients if he is concerned a dog might bite. Jack finds that if he works fast, the procedure will be completed before it becomes a problem, but that skill comes with experience. He thinks that veterinarians mainly get bitten when they are distracted or tired.

Jack recalls injuries that have happened over the years to clients and other veterinarians in the practice over the years. Clients have been injured by their own horses, by not restraining them properly when they were being stomach tubed. The horses have reared up and either struck or and bowled the clients over and one associate veterinarian has been trodden on by a horse and breaking several bones in her foot. In another incident, a client fell over when the horse struck her and as she fell backwards, she hit her head on the edge of a trailer. She could have had very serious injuries, but fortunately did not. This happened in the early days and since then the practice has developed a rule that if veterinarians are ever unsure about the safety of the situation to cease that procedure. Safety became part of the practice culture early on.

On another occasion, a young female associate while on holiday away from the practice was gelding some frisky horses with a colleague when she was kicked in the chest and mouth. She required considerable dental work to repair her mouth.

### **Chronic injuries**

He says he has never received any chronic injuries from pregnancy testing despite undertaking about 15,000 pregnancy tests per year over the past 10 years. He says the most he has ever done in one day was 800 cows, although he does recall finishing up with an arm that remained badly swollen for about 4 days. He says he wasn't really disabled and still went to work. He normally uses his left arm for pregnancy testing and occasionally changes arms when



tired. He has never had shoulder or elbow problems. Given the amount of pregnancy testing he says he has done, he believes that he has been lucky not getting any chronic injuries.

### **Zoonotic disease**

Jack knows he has had Brucellosis, but is not sure if it occurred when he was a veterinarian or whether he picked it up from his father's farm. When he was first married and working on his father's dairy farm, he did have a severe flu-like illness. It was much worse at night with nocturnal sweats but, during the day, it was tolerable. He does not recall having joint pains and now is not sure whether he actually had Brucella or Q Fever at the time. He believes it was more likely to be Q Fever because the sweats have not recurred as one would expect with Brucella. He has tested positive to both Q Fever and Brucellosis.

### **Stress**

Jack thrives on hard work and does not get stressed very often, although when he was working really long hours he reflects that it might have put quite a lot of stress on his family.

### **Suicide**

Jack thinks that suicide is a phenomenon of Australian society today, especially for those people in rural environments. He knows the figures are high for suicides in general, and particularly for young males in the country. He knows of a veterinarian, who as a student, attempted suicide. Jack's son who is also a veterinarian has had a couple of acquaintances from University who have committed suicide. As for his peers, Jack had an agricultural scientist friend who suicided, but he has no veterinary peers who have committed suicide.

Jack offered some ideas on why young veterinarians commit suicide. When he graduated, veterinarians who went into rural mixed practices "knew what they were letting themselves in for" and they even have tolerated more. However, as years have gone by, veterinarians' expectations about what practice is have changed and also what their levels of responsibility are. Today's graduates have a stronger animal welfare background and probably find it much harder to cope with dying animals, especially if they consider themselves a failure when animals die under their care. Jack knows some younger veterinarians who have been devastated by the loss of animals under anaesthetic. This has

generally occurred when they have not had good supportive work situations where work colleagues can help them deal with it.

### **Safety and lifestyle issues**

Jack's practice prides itself on its support of new graduates. He says the practice puts a lot of effort into selecting staff and supporting them. According to Jack, many veterinarians graduate believing that many procedures involve specialist tasks. Then they find a lot of practitioners who do undertake these procedures and the new graduates feel very pressured by being out of their depth. Training cannot always change this, as many students do not want to be pushed outside their comfort zone<sup>1</sup>.

Jack's practice has a very well developed and highly structured training program for students, which is very different from when he was a student and everything was quite *ad hoc*. The structured has been developed in conjunction with the veterinary school and while he and the associates are not paid for training the students, he believes this is what veterinary practices should do to improve veterinary graduates.

Jack's practice has a written safety protocol. There is a formal process for reporting accidents and for getting medical attention for people who get bitten. They also make sure records are kept. One of the veterinary nurses has done a postgraduate nursing course, which focused on developing protocols for clinics.

### **SUMMARY**

Jack has only had minor injuries from large animals but has had many near misses. He puts his lack of injury down to luck and also having a safety culture throughout the practice to minimise occupational injury for both veterinarians and the staff. He thrives on stress, loving his job. He has tested serologically positive to both Q Fever and Brucellosis, recalling having had a severe "flu" like illness which gave him drenching sweats at night.

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<sup>1</sup> Comfort zone is a term used to describe artificially created boundaries, within which an individual derives a sense of security.

## 29 SARAH

### **Introduction**

Sarah graduated 10 years ago and has worked in several Australian states. She began her career as an associate but had to leave because of a severe back injury and constant pain. She then took a part-time job as a researcher for two years and worked part time as a locum. She then started a mobile veterinary clinic which she converted to a veterinary hospital and runs on her terms. She has a partner and no children.

### **Veterinary career**

Sarah recalls that she was always interested in medicine and wanted to be either a doctor or a vet. As a small child she had stuffed toys and would bandage them up. She remembers looking after any little bird that fell out of a tree. Sarah prefers animals to people and this probably influenced her final decision to study veterinarian science. She did not have a problem with the course and graduated within the minimum five years.

Immediately upon graduating, Sarah gained work in a mixed animal practice in a rural logging, steel and sugar mill town. She called it a "sink or swim practice" where there was little support. She was "thrown in the deep end and only just managed to swim". It was a very busy practice with a huge after-hours load. She says that she was mentally stressed up to a point but really it was the physical aspects of the job she had trouble coping with. She would start off on a Friday morning, with normal consultations, be on call Friday night, have more consultations on Saturday morning and be on call all weekend and it was not until Monday night that she would go off duty. It was not uncommon to have only eight hours sleep over an 84 hour period. Because this was a large regional town with a shift work community from the hospital, steel works, sugar mill and police, there were people coming off shift at 2am. They might find their dog vomiting and call the veterinarian in the middle of the night or early morning. This is different from working in a city practice when people come home at five or six pm and one does not have middle of the night rush to attend to cases. Sarah could manage the "normal" practice hours but objected to the number of out of hours calls which she considered to be intolerable. The practice did not have an answering machine

so all calls went directly to the veterinarian on duty. To begin with it was a three veterinarian practice, then a fourth veterinarian was employed but then one of the bosses contracted a motor neurone disease and the other boss took less interest so it ended up a two and a half veterinarian practice. She stayed in this practice for two years supported by one other full-time owner who was there intermittently with the occasional locum employed. She ultimately had to leave due to the physical and mental strain and also because she had been incapacitated with a major back problem.

Sarah then worked for 2 years as a part-time researcher in nutrition. This enabled her back to recover. While doing the research, she would spend an occasional day working as a locum. She then undertook only locum work for two years. At this stage, she was the only veterinarian in the area, so she opened a mobile veterinary facility using the practice where she was a locum, as the surgery base. The mobile practice grew and she was then able to build her own veterinary hospital with the financial help of her mother. She has now been her own boss for four years. She still works as a single veterinarian with 1.5 nursing staff. Her hours are from 9 until 6 plus after-hours which in winter often means less than one call every three weeks. In summer she might get four tick poisonings in one night. Sarah generally loves the practice, but like any job there are days that are not so enjoyable mainly because of difficult clients. She tries to encourage the disagreeable ones to go to another practice. For example she will tell the client "I don't think your needs are being met by this clinic. Why do not you go somewhere else". There are two other practices about twenty five minutes away.

Sarah and the two other practices share a permanent locum. This enables each practice to have planned days off. However, the locum has currently gone overseas so they are all working longer hours and she dreads the summer season without a back up veterinarian. Sarah sees the problems as people not wanting to pay the cost of veterinary services, and the amount that locums want to be paid. She cannot afford to employ another practitioner at this stage, but when she can get another, she will consider a total change in career, but keeping the clinic so she can work the odd day here and there. Sarah has not taken a day off in a year now but intends taking two weeks off for a veterinary reunion to catch up with colleagues and learn how they handle their careers.

Sarah feels very tired and has lost her “sparkle for work” because of the heavy workload. The possibility of burnout is always in her mind

### **Injuries -small animal**

Sarah received a broken nose when she and a nurse were both putting an anaesthetised dog back into a kennel. The nurse unexpectedly used extra force lifting the dog and the dog hit Sarah’s nose. She put an ice pack on it and although it was pretty bruised, she did not seek medical attention.

In another incident Sarah dislocated a finger. She was trying to break the ovarian ligaments during a dog spay. She recalls that her finger was pointing the wrong way and the nurse almost fainted. She called the boss who popped it back in place and finished the surgery. The finger is a bit arthritic now and is still prone to dislocate during spays.

Sarah also reported that every now and then she is bitten by an animal, usually a cat, and while this may stop her hand from being fully functional for up to a week, she does manage to work around the injury. She usually tells clients that her hand has been injured and they are happy to reschedule their pet’s surgery until her hand is better.

About twice a year, Sarah comes close to having a very bad dog bite, but her reflexes are good so she generally avoids them. The bites she has received are mainly just nips that occasionally break the skin. However, she has been badly bitten twice but on neither occasion were sutures required. One injury was caused by a vicious Rotweiler which bit her on the backside following a house call. She had asked the clients to hold the dog until she had got back to her car, but they released the dog early saying “It’ll be right”, and then wondered why she has been bitten. As Sarah says, “if dogs are going to bite anyone, it is sure to be the veterinarian who on this occasion was the last one who jabbed them”. The other bite was from a dingo. The owners had forgotten she was coming and did not lock up their animal and it bit her on the thigh.

With any of the bites Sarah receives, she cleans up the wounds and then self administers antibiotics. The nearest doctor is 45 minutes away and she says she can wait for several hours before being seen. She does have a good friend who is a physician and if she has any concerns about the correct antibiotic or dosage she calls him. Being self employed and the only veterinarian in the

practice, Sarah cannot afford to take time off work so she just works around an injury.

### **Injuries – large animal**

Sarah reflects that there are always lots of bruises and cuts when one is working around cows but she does not consider these injuries an issue: it is just part of being a veterinarian. She recalls severely damaging the ligaments in her hand when doing dental work in a horse. She had the gag in the horse's mouth and was rasping the teeth with her hand at the back of the horse's mouth. Then one of the hinges on the gag snapped and smashed down on her wrist. At first she thought she had fractured her wrist but x-rays revealed no broken bones but the ligament going to the middle finger was damaged. Sarah recalls that she could not use that finger at all for a while and now it is only a problem when she does repetitive movements such as using a screwdriver to screw in a bone pin. The finger does flare up periodically and can be very sore. More recently Sarah had a dog jump up on her and bend her wrist back which resulted in the wrist being in a cast and a splint for a couple of months. During that time she would get locums to do the surgery.

Sarah described with clarity the acute injury to her back that changed her life as a veterinarian. She was working in her first practice as an associate and was on duty after-hours. She was attending a mare in trouble foaling. The foal was stuck in the mare who was thrashing around and the foal was being beaten on rocks and not breathing. She pulled the foal out with some effort and she and the farmer attempted to lift the foal over the fence to clean out the mucus in its lungs and nose so it could breathe. The farmer suddenly let go of the foal as it was too heavy for him leaving Sarah to bear all the full weight. At the time she felt something rip in her back but thought she had only pulled a muscle and drove herself home. The next morning she was unable to get out of bed and was taken to the doctor who told her that the injury appeared minor and x-rays were unnecessary and to take pain killers and rest. She took a week off work. At the end of the week, she was still in pain and could not straighten her back and again the doctor refused her request to be x-rayed.

Sarah continued to work with constant back pain for about three months and had to avoid lifting heavy animals. She recalls when bending over a table to vaccinate a dog there would be instant pain in her back and she would have to

stop. She remembers walking down a ramp at the back of the Veterinary Clinic and as she stepped off her back jarred and she fell to the ground. This time Sarah went to the Emergency Department at the Hospital where she was x-rayed and was told she needed to rest and to take more pain killers. She was still concerned so a medical friend got a spinal specialist to look at her x-rays. The specialist looked at the x-rays and said "Oh Shit! Your back is terrible. I hope you do not expect to be ever able to ride a horse or do anything very active ever again. I hadn't expected your x-rays to look that horrendous. You definitely have to lay off doing anything physical and have a good break from veterinary work." Sarah was devastated when she knew the full extent of her injury. At the time she had the impression that all she would be able to do was sit in a chair. No one mentioned seeing a physiotherapist so she saw all her future plans disappearing because of the damage to her back. At this point she asked to apply for Workers Compensation for her original injury, however the Workers Compensation law specifies that only certain doctors look at cases for assessment and the emergency doctor rejected the idea that her current injury was the result of what happened three months previously and refused to enter into any discussion about the matter. In hindsight, Sarah questions why the doctors did not x-ray her back in the first place and she asks herself why she did not demand x-rays be taken. She also said that her two bosses should have recognised that she had a major back problem and reported her case for Workers' Compensation. "After all, that's what Workers Compensation is for". But at the time she was in a lot of pain and taking pain killing drugs so was not thinking straight. She was also led to believe that when one first graduates, one should work hard and not complain about problems.

Sarah is very disillusioned with medical doctors. She describes some of them as not really "giving a toss about patients and just churning them through their practice to get paid by Medicare". Moreover, the only doctors who could and would do workers' compensation cases, were the ones who did not really care nor want to listen. Sarah acknowledges that this is possibly because so many people are trying to rort the system. She admits there are good doctors out there, but it is hard to get an appointment with them and mostly they do not see workers' compensation cases.

### **Chronic injury**

Apart from the back injury described above, Sarah has damaged shoulder muscles but cannot recall any particular incident that caused this. It may have come from holding horses and having them suddenly pull back jerking the shoulder muscles of. Occasionally, one of her horses will jerk her arm and she cannot use it for a few days. She now has a lot of physiotherapy and chiropractic done on her shoulders whenever the inflammation and pain flares up. Sarah has not received Workers Compensation or Work Disability insurance payments for this or any of her injuries.

### **Zoonotic and other disease**

Sarah discovered when working as a veterinarian that she is allergic to cats. She would suffer an asthma attack and had to take an inhalant like Ventolin. She was initially told by her doctors that she had an idiopathic eczema but some four years later they ascertained that she was allergic to about 98% of cat breeds. Her allergy is dependent on the pH of the saliva of the cat and different breeds have different pH in their saliva. She is more allergic to Asiatic cats, and is not at all allergic to British Shorthair cats. Her allergy also includes a delayed hypersensitivity reaction which would mean that 12-24 hours later her legs would have welts and get itchy. She now keeps her allergy under control with drugs, mainly antihistamines and if she has a lot of cats coming into the practice then she uses Claratyne.

She also says that when she has a heavy work load and is really stressed that she gets recurrences of Glandular Fever which she first contracted when she was a sixteen year old schoolgirl.

Sarah raised an interesting point about work contributing to urinary tract infections especially kidney disease. She thinks it comes from drinking too many cups of tea and not going to the toilet often enough. Doctors have told her that they see a lot of people who work in veterinary practices and hospitals who get urinary tract infections and if they are not treated immediately, the infection can move up into the kidneys.

### **Stress**

Sarah quit her first job around five months after she had sustained the initial back injury. She was in constant pain from her back injury, had been rejected



for Workers Compensation, was receiving minimal pay despite doing more than her fair share of the work, working horrendous hours, and was getting no support from her bosses. She could not cope so she loaded her horse onto the float and drove her car down the coast where she found somewhere to rent. She recalls having early signs of depression while still in the job, but the depression worsened when she moved south and had no money, friends or family and an unpleasant landlady. She was taking codeine most of the time and had no desire to do anything. At times, even just getting up to go to the letterbox was an insurmountable objective. She was constantly getting colds and would get emotional and cry frequently.

In retrospect Sarah believes that having to feed her horses and dog morning and night kept her going during this period. She lived from day to day trying to conquer her depression and after a month, having depleted her savings and needing financial support, she successfully applied for a job which would not require her to do anything physical. This was as a part-time researcher with a pharmaceutical company. She quite enjoyed her this job as it gave her body the necessary time to start healing.

### **Suicide**

During her depression, she admits to having serious thoughts about suicide but felt that there had to be a way out of her situation. In retrospect she believes she probably got very close to the point where she could no longer think rationally about her situation. She did not seek professional help because of her previous experience with doctors. Sarah got over her depression after about three years, but it does recur, although she is now aware of the signs and manages it with diet and herbs like St John's Wort. She refuses any chemical treatments for it.

Sarah's partner is at a loss to know what to do when she is depressed and hates seeing her sad. She will have a week where she cannot find happiness anywhere, she then manages for a few weeks and then she has a couple of days again of depression. She recalls that she wasn't like this as a child or as an undergraduate student and it has only come since her back injury and probably attributable to the constant pain. Nonetheless, she feels that she now manages her life and has regular physiotherapy and exercise. It is only about twice a year she suffers from neuronal pain with severe sciatica and disks

bulging. The rest of the time it is muscular pain. She also has a good chiropractor. According to Sarah, the pain is definitely manageable, but low level pain is always with her.

### **Safety and lifestyle issues –use of drugs**

Sarah feels there is a big issue in the veterinarian profession with alcohol and drug abuse especially in rural large animal veterinarians and generally because of the after-hours calls. Sarah describes veterinarians as those who need to drink and those who are teetotallers. A lot of veterinarians are notorious for drinking all the time. When she was doing her clinical practice as a student in a large practice in central NSW she recalls one night being almost run off the road by a drunken veterinarian driving on the wrong side of the road. Sarah also knows a lot of veterinarians who are teetotallers because they have seen the risks or have been close to being alcoholics themselves. She has also observed that it is hard to wind down in such a stressful profession. So a veterinarian might have one drink to help unwind which becomes two drinks and then three before they can actually get to sleep.

Sarah recalls one of her colleagues was deregistered for taking Ketamine and knows of others who are well known for their Pethidine abuse. They have been deregistered and then allowed back to work as veterinarians. A lot of this is due to their knowledge about drugs and ease of access. With large animals, veterinarians use large volumes of drugs so it is relatively easy to alter the records. "The horse still gets enough to make it happy and the veterinarian can get enough to make him/her relatively happy too".

Sarah herself admits that when doing after-hours work in the large animal practice, she would take large doses of Sudafed because of the pseudoephedrine, which helped her stay awake. She recalled often falling asleep when driving home and so she was taking the tablets to stay awake. She would then get another call and with only three hours sleep she would have to take some more pills in order to do a caesarean on a cow.

These days however, if she has had little sleep for two days, she tells the clients that she is not in a fit state to do surgery on their animal and suggests they go to another veterinary practice. She believes that they are actually grateful about her honesty. When she has students or other veterinarians working for her, she tells them "If a horse is too dangerous to handle do not handle it" and

she says to the owners, "If you can't handle your horse, do not expect me to be a trainer. Call me back when you can handle it". This is a complete change of attitude from when she was first in practice.

### **Thoughts on recent graduates**

Sarah believes that new graduates coming out want to earn lots of money, but they do not want to have to work for it. For example, they want large salaries, no after-hours and extra days off. However, the profession cannot support this sort of attitude, especially rural practices and it is very difficult to get locum staff or even new graduates to work in rural practices. Therefore country veterinarians are overworked and stressed and their relationships collapse. Spouses and partners get fed up because rural veterinarians only have time for animals and never enough time for them.

Sarah thinks that rural practice involves a whole gamut of problems, such as stress, depression, family break ups and long working hours. One becomes stressed because family life is not working, work is stressful which in turn makes the veterinarian more irritable at home. The only way to change this is to have more money to employ more veterinarians to lighten the work.

It annoys Sarah that today's veterinary graduates only want to know about cats and dogs and will not stray far from home preferring inner city jobs. Sarah has a friend who runs a big practice in a large town not far from Sydney, with all facilities and equipment and great pay and conditions, but he cannot get any applicants. Another friend who runs a veterinary clinic in a remote rural town asks the new graduates how much they want to be paid and he is prepared to pay it, but he still cannot get anyone to work there. Sarah has been talking to the veterinary management group that appraises and values veterinary practices and they have said not to expect to be able to sell her rural practice. These days if a veterinarian wants to retire or get out, they basically just close down because no-one will buy such practices.

Sarah suggested that the problem might be the type of people studying veterinary science. Some of the new graduates do not seem to have a commitment to the animals. Sarah has been surprised when a new graduate would insist on taking a lunchbreak when animals still required monitoring.

Their attitude is "stuff the animal". They are not doing veterinary science for the love of animals any more. The number of part-time females who do not want to become partners may be influencing this attitude. New graduates also appear less likely to try things and prefer not to step outside their comfort zones. To help overcome this, Sarah thinks that veterinary schools should be setting aside places for mature age students and also for country students who have grown up in the country and are aware of the lifestyle.

Sarah knows that if she changed her profession she would not have such a problem with her back. She acknowledges that she will be unable to do what she does now forever and looks forward to developing her clinic to the point where she has people working for her and she can have time off. She loves the profession and enjoys a challenge. However she would like to generate a proper income with a little more stability and be able to save money.

## SUMMARY

Sarah has had a number of bruises and cuts which she accepts because she works with large animals. She has had a number of bites from dogs and cats which she regards as inconsequential although she is still annoyed by a client allowing her Rottweiler dog to bite Sarah on the backside.. She dislocated a finger while spaying a dog and received a broken nose when one of the nurses used excess force when helping her put a dog in a cage.

She incurred a major back injury when she and the farmer were trying to save a foal's life and were together carrying it when the farmer let go of the foal. She did not receive good medical advice and continued to have back pain for several months until her back collapsed after a minor accident. The doctor refused to acknowledge it was the same injury as had originally occurred and refused to consider her for Workers Compensation. The pain and the drugs she was taking and stress led her to temporarily quit veterinary practice and move to a part-time position as a researcher. She became depressed and even suicidal however with rest and a change of scenery was able to rebuild her life and start her own veterinary practice.

## 34 JENNIFER

### **Introduction**

Jennifer is in her 40s, is married with three children and was running a mixed animal practice in a small rural town. She has recently re-evaluated her life goals and is in the process of selling her practice in order to spend more time with her husband and children.

### **Veterinary career**

Jennifer says she only decided to be a veterinarian in her second last year at high school. She wanted a challenge, an outdoor job and liked the thought of dealing with people and animals. The family had always had lots of pets and she had ridden horses since she was a small child so a veterinary career would mean she could work with the animals she loved. While she says her results were quite good, she says that she did have some trouble getting into the course and only gained admission after having an interview. She enjoyed the course and regards her time at University as the best time of her life.

After graduation, Jennifer worked in a five veterinarian outer suburban mixed practice where she recalls she was really closely mentored. She worked really hard and was paid a low salary with long hours. After about two years she suffered burnout and left to work in a rural practice. She blames the burnout on being the youngest practitioner in the practice, and, while she was only on-call one weekend in three, being on-call in those days meant that the veterinarian was really working. She had to deal with animals at the race track, dairy cattle, small animals – everything. Some nights she would knock off at 2am and have to be back at work again by 7am.

Jennifer says that the mentoring was wonderful and that the other veterinarians, especially the two principals, were very supportive. When she was working after-hours, both the principals would be on call so if she got stuck or wasn't sure about something, she only had to phone. Jennifer enjoyed working in this practice, but she found that her work took over her life and she had no social or recreational life. She admits that some of this was her own fault, because at the time her major goal was to become the best veterinarian she could and that working very hard with clever skilful people was the best

way to achieve this. Moreover, Jennifer's willingness to be involved and follow up her cases took up much of her time.

Jennifer recalls that her salary was appalling for what she was expected to do. If not on-call, she would start at 8 am and do small animal consultations until 7.30pm. If she were on-call, her day continued into the night. For Jennifer, it was a really exhausting two years.

Jennifer noted that there were others who had graduated with her and who were on equally low pay at other practices, perhaps doing better hours, but they had awful jobs.

A veterinarian in a rural town had asked Jennifer to work for him and she finally accepted. She enjoyed working at this practice and the hours were more reasonable, that is from 8.30am to 5.30pm. Jennifer actually persuaded her new boss to open longer by offering to do consultations two nights a week until 6.30 pm. This helped people who worked and were unable to bring in their animals during the day. Jennifer compared the two practices where she had worked. In the first, on the outskirts of the city, most of the after-hours calls were not real emergencies, while in the rural practice, if people rang after-hours, it was a genuine emergency.

She worked for this veterinarian for a couple of years and was actually running the practice on her own for a while because the principal practitioner was unwell. Ultimately he sold the practice to two other veterinarians and moved interstate. After the practice was sold, Jennifer was working for the new owners and had become engaged to a local farmer. She had some interpersonal difficulties working with one veterinarian and was happy to leave work when she married. She was able to continue treating horses because the practice wasn't interested in horses.

The two veterinarians who had bought the practice then closed down the practice and people started calling Jennifer. By then she had a baby and didn't want to open a practice but the requests still came so she began doing a bit of work and a bit more until she was full-time again. She then decided to set up a practice close to her new home which was about 40 kilometres from the town. She built stables and a veterinary clinic and business just snowballed from making just \$2000 per month to turning over \$17,000 per month in a really short time.

Initially Jennifer did all the work and then she employed locums and one and then two Associates to run a clinic in the town and help her. The practice continued to grow until eventually Jennifer found the pressure of work and running a family too great so she leased the business and sold the practice to one of the veterinary Associates. However Jennifer is saddened by what has happened to the practice. It has gone from being a three-man veterinarian practice to a one man practice. Her relationship with the remaining veterinarian is antagonistic as she sees the practice crumbling because of excessive charges and poor service.

### **Injuries – small animal**

Jennifer claims never having been bitten by a dog, but she was bitten by a cat on the fleshy part of her thumb. She thinks now that she was probably being careless and holding him herself by the scruff of the neck for a vaccination. He just swung around and got her. She says she has never been bitten before or since. She washed out the wound and applied Betadine, she wouldn't go to a doctor for such a petty injury. Only when it swelled up and became infected did she seek medical attention.

### **Injuries - large animal**

Jennifer's first large animal injury occurred almost ten years ago. She was stomach tubing a horse in a yard with very poor facilities. The horse reared and the owner who didn't know much about restraining horses, got a fright and pushed Jennifer backwards over a rail and the horse landed on her. She recalls that the horse's front legs were over the top of her and she was sitting under its belly in between it and the rail. Her back was extremely sore but she finished tubing the horse and then drove herself home in pain and went to the doctor. The doctor diagnosed that it was most likely a soft tissue injury. She then travelled to a regional hospital for radiographs which revealed she had no broken bones. It was decided she should see a physiotherapist who initially worked intensively with her and Jennifer thinks she was off work for about three weeks. It was covered under Workers Comp. When she returned, she was able to do some small animal consultations and surgery and gradually got back into heavier veterinary work.

Jennifer maintained that she has had many needle-stick injuries, especially from the anthrax vaccination of sheep for the live sheep export market. Luckily she has not had any reactions to the vaccine.

Jennifer's worst injury occurred several years ago. When pregnancy testing a lot of cows and she incurred hyper-extension of her right arm. Jennifer's arm was inside a cow palpating her uterus and the cow jumped up and her arm bent backwards. Her first thought was that her arm had broken off. Jennifer completed pregnancy testing using her left arm with her right elbow wrapped in ice. By the time she got home she couldn't use her right arm so went to a doctor, who put her on anti-inflammatory drugs. Jennifer couldn't feel anything or do anything with the arm for about two weeks, but it took three months before it was better. She was self employed at the time and didn't have workers compensation or disability insurance. She now makes sure she has this cover.

### **Chronic Injuries**

Jennifer also suffers from severe arthritis in the wrists and thumbs through vaccinating sheep for export. The practice she was working in did a lot of live sheep export work but their equipment was not designed for what they were doing. They would run up to 100,000 sheep through a race and as each one raced past, Jennifer had to inject them in the paunch. She had to use both hands to hold the vaccination gun and used to tape her hands and wrists with elastoplast to protect them. The most arthritic finger is the index finger on her right hand which she also uses with the needle drivers when doing surgery on large animals with thick hides. Jennifer recalls that the practice decided it was cheaper to put embryos into heifers than mature cows which meant that every calf had to be delivered by caesarean section. On one very memorable occasion, Jennifer carried out 22 caesareans in one day, which further added to the repetitive strain Injury.

### **Zoonotic and other disease**

Jennifer injected herself with anthrax vaccine many times but without any effect. However, she did get a severe infection following the cat bite previously described and was given a range of antibiotics which had no effect. Eventually she sent a swab from the lesion to the pathology laboratory which



was unable to identify the organism. They in turn sent it to a major diagnostic centre which finally diagnosed Sporotrichosis. She took potassium chloride orally for three weeks, and did recover completely. Jennifer described "the treatment as worse than the swollen thumb".

Jennifer has had eight miscarriages. She has also had a new born son die after two days. She was not tested when she had the miscarriages which mostly occurred around the 12 weeks stage. When she had a severe haemorrhage, the doctors would say "let's see how you go". She was only offered curettes on three occasions and never had any blood transfusions. Jennifer recalls that after each miscarriage she would be tired and irritable for about a fortnight.

In hindsight, Jennifer is not sure how she managed what she did. The miscarriages, "slowed her down a bit" but she continued to work. She also worked throughout her pregnancies. She recalled an occasion when her first son was three and she was about eight weeks away from having her second son. She had just done a breech calving which she describes as "pretty disgusting with lots of blood" and "plenty of bellowing from the cow". As she was walking back to the car, her first child looked up at her and said, "Mum, I reckon we should cut our baby out."

### **Stress**

Jennifer found it difficult to run the practice with her family and employed a couple of younger veterinarians who seemed more interested in making a lot of money than in providing a good service. There has been some nasty and unnecessary feedback from clients as a result and this has concerned Jennifer. She recalls spending a couple of years in a "haze" with no energy and she had difficulty concentrating. Jennifer thinks she probably had a nervous breakdown but she did not seek medical help for this. It was only few months after selling the practice that she began to gain more energy and have some coherent thought patterns.

Jennifer is full of admiration for her husband and his support of her. She now believes that women have to put their personal lives first. "Eventually one comes to the realisation that without a happy personal life, there is nothing".

### **Suicide**

Jennifer indicates that she has never ever felt suicidal but does know of veterinarians who have committed suicide. She also knows a lot of male veterinarians who are hopelessly stressed. She believes that they cannot handle the emotional side of being in practice very well and do not have good coping skills.

### **Safety and lifestyle issues**

Jennifer does not think that most veterinarians charge farmers too much. Also if the veterinarian provides a good service and communicates well, farmers do not mind paying. However, if a veterinarian charges clients a lot of money and the animal dies and that may happen to them three or four times, the client will be very disgruntled unless there is a really good explanation. Marking up the cost of drugs only makes people seek alternatives, sometimes from illegal sources. After all, according to Jennifer, the farmers should know what they should cost.

### **Thoughts on new graduates**

Jennifer thinks that the training for veterinarians today needs to be improved because new graduates have little self confidence. She has had veterinarians apply for a job who will not work unsupervised. Although Jennifer believes in mentoring, demanding to be supervised the whole time is totally unrealistic.

However, because Jennifer's priorities have changed, she is selling the second practice. Being on call after-hours has led her to this. She has also lost patience with rude and ignorant clients and often she feels like "telling them what she thinks". But, "if you are going to be in practice, you can't do that. You have to embrace them and love them".

### **Introduction**

Gavin has been a veterinarian for more than thirty years and runs his own practice employing two associates. His practice is in a semi-rural area which is becoming increasingly urbanised. He is married with four children and several dogs, but no cats because of concerns about wildlife.

### **Veterinary career**

As a young child, Gavin spent a couple of years on a dairy farm and the family always had pets. Gavin really wanted to be a fighter pilot in the RAAF however, he grew two inches too tall and consequently could not be considered. He did some zoology studies at school and once saw a veterinarian do an autopsy and that helped him make up his mind to become a veterinarian. He found that the course required a lot of work but he knew he just had to complete it if he wanted to become a veterinarian.

In his first year after graduation, Gavin worked as an associate for a veterinarian who lived close to his home and whose kids he had played with as a child. He was mostly working with cattle, small animals and a few horses. His boss was involved with the local Council which meant that Gavin was often left on his own. He recalls that although it was tiring, he felt reasonably confident but if he had a problem, the boss would always come and help.

He then worked as a locum in a mixed animal practice for four months before taking a job in Canada transplanting embryos. He didn't enjoy his time in Canada very much and had ethical concerns about the program which used highly expensive European cattle with "dodgy" fertility. These cows were being super ovulated and their ova were being transplanted into other cows to produce calves which would ultimately form the basis for the Canadian beef industry. His boss was only interested in making a lot of money and Gavin was concerned that they were turning out a whole bunch of infertile cows. He resigned and eventually the resultant infertile heifers proved him right.

He then worked in a mixed practice in Canada which he enjoyed and then spent a year teaching at an Agricultural College. Next came a job with the Canadian Government doing field work and then meat inspection for about a

year before returning to Australia. He describes the temperature in Canada as being around  $-40$  to  $-50^{\circ}\text{C}$  and when doing caesareans, if he waved his scalpel around while talking to the farmer, once the initial cut, had been made if you brushed the blade against the cow, it would freeze to the side of the cow.

When Gavin and his Canadian wife returned to Australia, there were few jobs on offer so they started a small animal practice in rural Australia. Next they built a bigger practice a few kilometres from the original one and they are still there twenty five years later. His wife, a nurse, who initially worked in the practice, now works in the local hospital.

### **Injuries - large animal**

Gavin remembered receiving a lacerated hand while working for the Canadian government doing Brucellosis testing. They were having trouble handling the cattle and had to borrow a neighbour's crush or squeeze as they are called in Canada. The crush was being loaded onto a truck with a forklift when it slipped and cut his hand. A medical practitioner stitched it up and he went straight back to work. Gavin recalled that it was so cold he could not feel any pain and so just continued working.

Gavin's next injury was a broken nose while working with a heifer. It was 1.00 am and the heifer was having difficulty calving. He and the farmer were trying to get her into the crush but she bolted through the door. Gavin recalls that, "at one o'clock in the morning I wasn't about to let her escape and have to catch her again so I dived out to grab her and hung onto her head". However, he slipped and the cow's knee hit him in the face. He recalls that his nose and the upper front part of his jaw clicked a bit for a while and later settled down. Nonetheless, he didn't miss any work, nor did he see a doctor. "Even though it was swollen, everything was sitting in place because there's not a lot the doctors can do".

In another incident, Gavin received a cracked sternum, a torn ligament in his knee plus a chip in the knee, an injured ankle, concussion and a split lip. When pregnancy testing cows, he jumped into the yard to push them further up into the race. A cow turned around and came at him. Gavin remembers that she had her head down, hit him at midriff level and he was thinking "This is going to hurt". He was knocked unconscious and taken to hospital by

ambulance. The cow had caught him and flipped him down the yard and then trod on him as she tried to escape. The farmer and his wife let the cow out and called an ambulance after rolling him into the CPR recovery position. After x-rays and CT scans, the doctors decided to send him home because of a shortage of beds asking Gavin's wife to keep an "eye on him" for head injuries. He was off work for about a week. In hindsight, Gavin thinks he was not concentrating because he was thinking of his next case. He misjudged the cow and her desire to escape, and should have roped the cows and tied them to posts as the yards were too big and allowed too much movement among the cattle.

### **Zoonotic and other diseases**

Gavin recalls getting Psittacosis after examining some parrots. The birds were brought to the clinic in a box and he did not actually get them out because the client said they were sick. He could see that they had a respiratory disease so he gave the owner some Doxycycline. Gavin found out later that they were wild birds and had been trapped. About three weeks later, he thought he had the "flu" and when he was not getting any better, he thought he would take a few days off but found he was getting more tired and even more short of breath. After a long series of tests, the diagnosis was Chlamydiosis. It was Gavin who suggested he had Psittacosis. Gavin later phoned the client and asked him about the parrots and was told that the parrots had escaped. He ended up being off work for a couple of months.

Gavin obtained the disease Giardiasis while working as a veterinary consultant in Indonesia. He experienced acute diarrhoea and was diagnosed and treated with a full recovery. He thinks he was probably careless with what he was drinking.

Gavin has also had a grade three melanoma however he cannot be certain that it is occupational. The melanoma has been removed plus a couple of precancerous moles. In addition, Gavin has had a few basal cell carcinomas on his face which he does regard as occupational because of all his fieldwork with cattle. He now tries to wear a hat, however, the hat gets knocked off regularly so there is a tendency to work without the hat.

## **Stress**

Gavin says it is impossible to work in veterinary practice especially with large animals without being stressed. At one stage he was getting lower chest - upper abdominal pains and was quite concerned given his medical history with melanomas. Doctors decided it was probably aerophagy which is stress related and caused by swallowing air. Since then, he drinks Lemonade or Coke to bring up the gas which makes him feel better.

## **Suicide**

Gavin has known of a few veterinarians who have committed suicide. Two graduates from his final year killed themselves, one male and one female. He thinks that the female veterinarian had already made five attempts on her life. The other veterinarian whom Gavin considered to be schizophrenic, also committed suicide. He heard that this person had an argument with his boss and decided to set up a private practice in competition. His girlfriend had left taking the money he had given her to buy drugs for the practice. Then he found out he could get drugs on credit and ended up suiciding on drugs. Gavin knows of other veterinarians who have suicided. He thinks at times veterinary work does "get to you". When he is stressed he just gets in his car and drives away from the problem. Never suicidal himself, he feels that life is already too short, "Why shorten it further?"

## **Safety and lifestyle issues**

Gavin has considered cutting back on large animal work because the small animal component is rising in his practice. He certainly does not need to work in substandard facilities. According to Gavin, most farmers with poor facilities have gone out of business in his area. The only ones left have all got reasonable facilities except for a few hobby farmers with three or four little Dexter cattle in the back yard. He just throws them some feed and drops a rope around their head and ties them to a post. These days he takes fewer risks as he is getting older. When he was younger he took lots of risks because it was all part of the game, "a macho thing" but he finally got tired of being knocked around realising that injuries take too long to heal. So small animals are getting more attractive as he gets older, because they mean more predictable hours and fewer occupational risks.

Gavin regrets not having spent enough time with his family when his children were young. When they were teenagers, he decided to spend more time with them, and this decision he says probably cost him about ten years of income through lack of growth in his practice. He has no regrets because he got to know his children which was enjoyable. Gavin has no real regrets about becoming a veterinarian either and still enjoys working in veterinary practice apart from some of people he has to deal with. He takes regular holidays, has a good philosophy of life and now appears quite unstressed.

### SUMMARY

Gavin has had a varied career working in Canada and Australia. All his injuries have been caused by cattle. He received a broken nose when trying to stop a cow from bolting. His worst injury came from a cow that charged him as he was trying to get her into a race. He sustained a cracked sternum, torn ligaments and a chipped knee, an ankle injury and concussion. He has had Psittacosis from treating wild parrots and has had a melanoma and basal cell carcinomas from working in the sun. Long working hours meant stress and a disrupted family life. He changed when his sons were teenagers and spent more time with them and less on his practice with a resultant decrease in his stress.

## 42 DANIELLE

### **Introduction**

Danielle is a 29 year old veterinarian married to a non veterinary professional. She has worked only in small animal practice since graduating seven years ago and currently works 40-45 hours per week in a suburban practice with several other veterinarians. Danielle has no children.

### **Veterinary career**

Danielle comes from a city background with loads of pet dogs, cats, birds, ferrets, guinea pigs, baby goats and lambs and a love of animals. She was probably only thirteen or fourteen when she made up her mind to become a veterinarian. She found veterinary study was a bit of a shock because in the first year it was easy and she got high distinctions without having to work very hard. Then in the second year with more work, personal issues, and being one of the youngest in the class, she struggled to cope. From then on she found the course extremely hard and all she wanted to do was to graduate.

Danielle enjoyed the clinical practice part of the course but found it stressful because she is not overly confident. She admits that from about second or third year she wasn't really interested in large animal clinical practice as she had no intention of working with large animals and just focused on the theory and practical exams especially of small animals. She married at the end of her fourth year.

Danielle did not want to go straight into practice so she continued doing veterinary nursing, which she had been doing in her final year. She then applied for a job interstate and was successful. This was with a six-veterinarian small animal city practice with two outside clinics and a lot of after-hours work which she found difficult. She was on call one or two nights a week and usually in the clinic until midnight. Being on call also meant monitoring the hospitalisation of animals from the other two clinics. Danielle found it easier to just stay at the practice while on call. While Danielle was only supposed to work 45 hours a week, often she would only get a couple of hours sleep. She recalls on one occasion being on duty for 48 hours straight before going home. At the time she just accepted that this was what the job was and she was just



happy to have a job. Also the salary was good for a new graduate at the time. She was paid \$32000 with a \$25 retainer for the night and 50% of the professional fee for after hour calls.

Danielle became homesick and moved to be closer to her family. She immediately got a job in an outer suburb practice which dealt primarily with small animals and the occasional sheep, goat or horse. She enjoyed working at this practice until the boss sold it to a non-veterinarian. Danielle recalls being the only permanent veterinarian with support from a string of locums. The new owner knew nothing about running a veterinary practice or managing staff. Danielle found that she would have only 24 hours notice when she could take days off and these last minute decisions had to suit the locums. At first Danielle agreed to work weekends for six weeks straight, so she could have time off on Sundays once her Netball season started. After the six weeks of weekend work, she was told that they could not get locums for Sundays and that Danielle would have to continue working. She recalls becoming quite stressed and left the practice after 12 months.

Danielle then worked at a multiple veterinarian small animal hospital with a branch clinic and has now been there for three years. She loves the work and does about forty hours a week. She does get stressed occasionally because one of the veterinarians often reprimands the veterinary nurses and they always "cry on her shoulder" about it. Danielle feels quite confident about her abilities now. She has plenty of support if she needs it and is definitely not the insecure person she was seven years ago.

### **Injuries - small animal**

Danielle recalls that her first major injury was from a cat bite about six years ago. She thinks it had heart failure so it was in an oxygen tank. When Danielle tried to inject it, the cat turned and bit her. She did not have time to wash the wound or treat it at the time but just put on a bandaid. Twenty four hours later, she took the Bandaid off and saw that it was already infected. Danielle admits that this was because she neglected the wound. She had to seek medical advice and was given a tetanus injection and was treated with antibiotics.

Danielle also cut her hand with a scalpel blade when removing a dog's dewclaw. She recalls that she did not wash or clean the wound immediately

but just put another glove on the hand and kept going with the surgery. That night she cleaned it with Betadine, put a Band Aid on and it healed up without incident.

Her next injury was a scratch from a Labrador puppy. She was kneeling in front of him ready to anaesthetise him when he jumped catching his nail in her arm. While it has left a scar on her arm, Danielle says it was minor and did not require any attention.

Recently Danielle was bitten badly when she and another veterinarian tried to put a gastric lavage tube in a dog to relieve bloat. The dog was very old and they were worried it would not survive a general anaesthetic. Danielle recalls foolishly trying to prise the dog's mouth open to stop it from chewing on the tube. The middle finger on her left hand became caught by his back molars. It bled a lot so they applied a Band Aid to stop the bleeding while trying to save the dog. It was another hour at least before they finished working with the dog. On removing the Band Aid, Danielle could see that her nail was split. She rinsed it, soaked it in Betadine and put ice on it. The next day she went to the doctor and got antibiotics as a precaution against infection. She was unable to do surgery for about a week so the other veterinarians changed their rosters to help. She thought it had healed quite well until the new nail started to lift. Her doctor has suggested that the nail bed may be permanently damaged. Danielle is now waiting to see what happens. The injury has now been reported for Workers Compensation because she may need surgery to burn out the nail bed to stop the nail growing abnormally.

Danielle does not know of any other profession that puts workers at risk of injury as much as the veterinary profession does. Although veterinarians do a lot of unwise things, "one does what is necessary to do at the time".

### **Stress**

Danielle recalled being stressed in her final year so she took a few months off before seeking employment and that meant she had more difficulty in getting a job. She was also stressed in the beginning because she lacked confidence in being a veterinarian. She explained that there was a difference in "being" a veterinarian and just having done five years of veterinarian science. Her first job was interstate and on her first day when treating an abscess in a cat, she still

consulted with the other veterinarian before treating the animal. She recounted that she should not have had to check for something so simple. She believes however that it was probably the best job she could have had. She had committed to staying in the job for eighteen months, so her husband took leave without pay and worked locally as a manual labourer. However, they were both homesick for family and friends. Danielle's husband used to sit at the practice all night with her and she recalls that she would not have lasted without his support. Danielle does not think she had depression but every couple of weeks she would be on the phone crying to her mother. She is an emotional person, so if she had a bad day, she would have a cry and get over it.

Danielle thinks that as a student she should have received more exposure to clinic situations. She regrets that she did not "do a live in" clinical practice at University. This is where students were on call for treating animals and were able to admit animals if an emergency arose. She says that while this seemed to add stress to their studies and while most who did the practice did not do as well academically, these students were more prepared when graduating. Danielle says that there were only limited opportunities to do live in practice at the University and these were taken up very quickly by the students.

Danielle says that many of her close friends have actually left veterinary science because they are disillusioned and do not want the stress. However she is glad to be a veterinarian and would not change anything.

Danielle has not known any veterinarians who have killed themselves although she says she has heard of some cases. She has certainly never contemplated suicide herself.

## SUMMARY

Danielle delayed getting a job after graduation and her first job in small animal practice was interstate. She lacked confidence initially and relied on supportive veterinarians to help her. She was married and despite her husband's company, felt very stressed, homesick and even depressed at times however she had committed to working at the practice for two years. On her return home to a second job, she found that to be less stressful and more enjoyable.

She has been bitten on the hand by a cat that resulted in an infection because she had been too busy to treat the wound when it occurred. A second time she cut herself with a scalpel blade while de-clawing a dog. More recently she was badly bitten on the finger while intubating an old dog. This has resulted in a split nail, which may require surgery.

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**Appendix D:** Letter to registered veterinarians in Western Australia and to Phase 1 subjects

May 2004

Dear Colleague

Thank you for having previously allowed me to interview you. I am in the process of rewriting your interviews as stories and will be changing your names and any identifiers such as place where you worked once the stories have been confirmed by you as being accurate. (It became too confusing for me to change your names and where you worked up until after you have looked at them). I now need a little more information about stress and job satisfaction in veterinarians and some of the factors affecting these.

I would like to invite you to answer the attached questionnaire so that we as a profession can gain a better understanding of the changing personal demands of veterinary work. While the questionnaire appears to be directed primarily at colleagues in veterinary practice, we are also trying to find out how Government, University and other types of veterinarians deal with the challenges of current veterinary practice. You will note that I have identified your questionnaires with a blue sticker. This is so that the people I have interviewed will be identified as a subset of a much larger survey of 700 + veterinarians. It is important that your grouped results especially for the parts on K10+ and job satisfaction, are compared with information I have previously obtained.

This survey is anonymous and all information provided will be maintained in the strictest confidence following the confidentiality requirements of the National Health and Medical Research Council for research with human subjects.

All results will be reported in aggregate form only and will not permit the identification of any specific individual in any published material. As we are such a small profession you might wonder if it would be possible for me to personally recognise another a member of the profession from their responses (for example someone identifying themselves as Government veterinarian, over 55 years of age and working with pigs or a University veterinarian over 55 working with dairy cattle). To overcome this concern I will be asking a non veterinary statistician to open the returned questionnaires, code and analyse the data to preserve the anonymity of all responses.

Please feel free to contact me if you wish to discuss any of this further.

Helen M Jones (Fairnie) BVSc, BEd, MPhil, GradDipBus

Telephone (08) 9266 1029 work  
(08) 9310 9905 (after 7 pm & before 7 am)  
Mobile 040 8958506  
Email [h.fairnie@curtin.edu.au](mailto:h.fairnie@curtin.edu.au)

May 2004

Dear Colleague

I have been working on my PhD for many years now and am in the process of writing it up. I need a little more information about stress and job satisfaction in veterinarians and some of the factors affecting these. As I state on the questionnaire, this survey has nothing to do with a survey sent out some time ago through the University of Western Australia.

I would like to invite you to answer the attached questionnaire so that we as a profession can gain a better understanding of the changing personal demands of veterinary work. While the questionnaire appears to be directed primarily at colleagues in veterinary practice, we are also trying to find out how Government, University and other types of veterinarians deal with the challenges of current veterinary practice .

This survey is anonymous and all information provided will be maintained in the strictest confidence following the confidentiality requirements of the National Health and Medical Research Council for research with human subjects.

All results will be reported in aggregate form only and will not permit the identification of any specific individual in any published material

As we are such a small profession you might wonder if it would be possible for me to personally recognise another a member of the profession from their responses (for example someone identifying themselves as Government veterinarian, over 55 years of age and working with pigs or a University veterinarian over 55 working with dairy cattle). To overcome this concern I will be asking a non veterinary statistician to open the returned questionnaires, code and analyse the data to preserve the anonymity of all responses.

Please feel free to contact me if you wish to discuss any of this further.

Helen M Jones (Fairnie) BVSc, BEd, MPhil, GradDipBus

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**Appendix E:** Questionnaire to all registered veterinarians in Western Australia and to Phase 1 subjects





6b If you are in **private clinical practice** are you a: Sole owner 1 Partner 2 Associate/locum 3

6c **No matter what your type of veterinary work**, what % of animals do you deal with?

Dogs/cats/birds/other small pets \_\_\_\_\_% 1  
 Horses \_\_\_\_\_% 2  
 Cattle/sheep/pigs/goats/poultry etc \_\_\_\_\_% 3  
 Other (specify \_\_\_\_\_) \_\_\_\_\_% 4

7a How many hours/week do you work **excluding after-hours** \_\_\_\_\_ hrs/wk

7b How many week nights are you on after-hours-duty each week 1 2 3 4 5

7c How often are you on weekend duty? **Every weekend** 1 in 2 1 in 3 1 in 4 < 1 in 4  
 1 2 3 4 5

7d How many hours/week do you work on average **including after-hours** \_\_\_\_\_ hrs/wk

7e How does being on call after hours affect **your ability to sleep?** (Circle appropriate response)

No/ little effect 1 Some/moderate effect 2 Major effect 3

7f How does being on call after hours affect **your energy levels?** (Circle appropriate response)

No/little effect 1 Some/moderate effect 2 Major effect 3

7g How does being on call after hours affect **your family life?** (Circle appropriate response)

No/little effect 1 Some/moderate effect 2 Major effect 3

8a Have you ever experienced a **back problem** resulting from lifting or moving an object or animal or from an injury by an animal at work in the past five years? Yes 1 No 2

8b What is your disability if any resulting from **work incurred** back problems? Circle response

None/niggling moderate Moderate much pain much pain  
 Pain 1 pain/ little pain/moderate /moderate much  
 disability 2 disability 3 disability 4 disability 5

9a Have you experienced any **pain associated with work related repetitive motions** such as pregnancy testing, computer work or performing frequent activities such as injections during the past 5 years? Yes 1 No 2

9b What is your disability if any resulting from **work incurred** repetitive motions? Circle response

None/niggling moderate Moderate much pain much pain  
 Pain 1 pain/ little pain/moderate /moderate much  
 disability 2 disability 3 disability 4 disability 5

10 Have you had any **motor vehicle injuries** during the **past 5 years**? Yes 1 No 2

How many work related car accidents have you had? \_\_\_\_\_

How many injuries did you sustain from these car accidents \_\_\_\_\_

Please describe the major injuries and your level of impairment.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

11 How many major **acute occupational injuries requiring half a day or more off work** have you experienced in your entire CAREER as a veterinarian? Please briefly describe these!

	Types of Injury <i>eg back injury</i>	Causes of Injury <i>eg Lifting large dog into truck/horse kick etc</i>	Diagnosed/ and Treated by whom? <i>Eg GP/Specialist/Self</i>
1			
2			
3			
4			
5			
6			

12 How many other serious **occupational injuries/incidents** have you had where you did **not take time off from work**? List below?

	Type of injury <i>eg back injury</i>	Causes of Injury <i>eg chemical spill, dog bite/ lifting large dog into truck/ horse kick etc</i>	Limitation to work?
1			
2			
3			
4			
5			
6			
7			
8			

- 13 How many **occupational zoonoses** have you suffered in your total CAREER as a veterinarian. List below? (*Do not include Allergies here*)

	Zoonosis	Effect on you	Diagnosed/ and Treated by whom? Eg GP/Specialist/self
1			
2			
3			
4			

- 14 Do you take **serious risks** that could result in incapacity **now** in carrying out veterinary practice?

Often 1      Sometimes 2      Rarely 3      Hardly Ever 4

- 15 When you first graduated, **did you take serious risks that could have resulted in incapacity** in carrying out veterinary practice?

Often 1      Sometimes 2      Rarely 3      Hardly Ever 4

**Question 16 is for female veterinarians only.**

- 16a If you are a female veterinarian, have you worked as a veterinarian **while you were pregnant**?      Yes 1      No 2

- 16b Did you stop undertaking certain work practices **once you found out you were pregnant**?  
Please describe \_\_\_\_\_  
\_\_\_\_\_

- 16c Have you experienced any **reproductive problems that you believe were veterinary related** since you have been working as a veterinarian?      Yes 1      No 2

What problem and severity(s)? \_\_\_\_\_

- 16d How much **risk of injury/disease** do you believe there is to an **unborn child** associated with your daily veterinary work?

High amount 1      Moderate amount 2      Low amount 3      None 4

If high or moderate, why? \_\_\_\_\_

- 16e As a female veterinarian, when you see a GP or specialist or are admitted to hospital, **do you use the name you are registered** as a veterinarian? *This lets us know if published grouped statistics of health problems in veterinarians include all veterinarians.*

Yes 1      No 2

All veterinarians to answer please

**This section has been included to see how much stress is involved in working as a veterinarian**

**17** What **regular and serious stressors** do you have in veterinary practice (eg financial, staff, clients) and what are your **major strategies** to enable you to cope with stress in your veterinary practice?

Suggested strategies could include:

- |                               |                                |                        |
|-------------------------------|--------------------------------|------------------------|
| <i>Partner/family support</i> | <i>Professional counseling</i> | <i>Talking with GP</i> |
| <i>Peer support</i>           | <i>Cigarettes</i>              | <i>Alcohol</i>         |
| <i>Drugs</i>                  | <i>Meditation</i>              | <i>Religion</i>        |
| <i>Listening to music</i>     | <i>Doing nothing about it</i>  |                        |

	Stressor	Coping Strategy
1		
2		
3		
4		

**18a** How frequently do you **become angry** when you are working?

Several times/day 1    once/day 2    once every 2-3 days 3    once/week 4    rarely lose temper 5

**18b** Who do you take your anger out on? *Circle relevant response(s)*

Veterinary staff 1    Nursing staff 2    Clients 3    Family 4    Friends 5    Self or No-one 6

**19a** How many standard drinks of alcohol do you currently drink **per week**? \_\_\_\_\_

**19b** How many cigarettes do you currently smoke **a day**? \_\_\_\_\_

**19c** Are you presently taking **prescribed antidepressants**?                      Yes 1                      No 2

**20a** When was the last year you had a **routine preventive medical checkup** with your GP or specialist? \_\_\_\_\_

**20b** How frequently do you have such checkups?

once 1                      once each 2                      once each 3                      once each 4                      less than once 5  
each yr                      2-3 yrs                      4-5 yrs                      6-10 yrs                      each 10 years

*Go to next page for job satisfaction section*

21 **Job satisfaction**

How **satisfied** or **dissatisfied** do you feel with each of the features of your present job as a veterinarian *Mark the appropriate box.*

	Very or extremely dissatisfied	Moderately dissatisfied	I am not sure	Moderately satisfied	Very or extremely satisfied
1. The physical work conditions					
2. The freedom to choose your own way of working					
3. Your fellow workers					
4. The recognition you get for good work					
5. Your immediate boss or partner(s)					
6. The amount of responsibilities you are given					
7. Your income or rate of pay					
8. Your opportunity to use your abilities					
9. Industrial relations between employers & employees in your firm, department or practice					
10. Your chance of promotion or increased pay or increased income					
11. Amount of out of hours work or being on call					

22 List the major reasons **why you became a vet** and to what extent have your **expectations** been met?

	Reason for becoming a vet	Realised Completely/ Mainly	Realised Somewhat	Realised little or not at all
1.				
2.				
3.				

23 Taking all things together, **how would you rate your happiness today?**

Very happy 1      Fairly happy 2      Not very happy 3      Miserable 4

24 How likely are you to **still be working as a veterinarian** (*according to the definition at the beginning of the questionnaire*) **in five years' time?**

Definitely or most likely working as a vet 1      Possibly working as a vet 2      Not sure whether I will or won't be working as a vet 3      Possibly not working as a vet. 4      Definitely not or most likely not working as a vet.5

*See next page for a measure of your feelings*

## Self Report Measures for Adults K10+

This standard scale for assessing **how you are feeling** was developed by a psychologist called Kessler. It initially asked only 10 questions and was called K10 however an additional 4 questions have been added to look at the impact of how one feels has on the person (K10+). These extra questions seek the person's view of the extent to which physical health problems have caused the way they are feeling. The results will be compared with those of other Western Australians who have undertaken this test.

*Instructions*

The following ten questions ask about how you have been feeling in the last **four weeks**. For each question, mark the circle under the option that best describes the amount of time you felt that way.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
1. In the last four weeks, about how often did you feel tired out for no good reason?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. In the last four weeks, about how often did you feel nervous?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. In the last four weeks, about how often did you feel so nervous that nothing could calm you down?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. In the last four weeks, about how often did you feel hopeless?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. In the last four weeks, about how often did you feel restless or fidgety?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. In the last four weeks, about how often did you feel so restless you could not sit still?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. In the last four weeks, about how often did you feel depressed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. In the last four weeks, about how often did you feel that everything was an effort?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. In the last four weeks, about how often did you feel so sad that nothing could cheer you up?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. In the last four weeks, about how often did you feel worthless?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next four questions are about **how these feelings** may have affected you in the last four weeks.

You need not answer these questions if you answered "None of the time" to **all** of the ten questions about your feelings.

11. In the last four weeks, how many days were you <b>TOTALLY UNABLE</b> to work, study or manage your day to day activities because of these feelings? _____(Number of days)
12. [Aside from those days], in the last four weeks, <b>HOW MANY DAYS</b> were you able to work or study or manage you day to day activities, but had to <b>CUT DOWN</b> on what you did because of these feelings? _____(Number of days)
13. In the last four weeks, how many times have you seen a doctor or any other health professional about these feelings? _____(Number of days)
14. In the last four weeks, how often have physical health problems been the main cause of these feelings <div style="text-align: right;">                 None of the time                    <input type="radio"/>                  A little of the time                <input type="radio"/>                  Some of the time                    <input type="radio"/>                  Most of the time                     <input type="radio"/>                  All of the time                        <input type="radio"/> </div>

*This last question is optional*

26 Have you taken any of the following for **non medical purposes** in the past **12 months/ 4 weeks**.  
(Check the box)

	Pain rs analgesic	Tranquillizer Sleeping pil	Steroids	Barbiturat	Marijuan	Heroin	Amphetamines
Last 12 month							
Last 4 weeks							

	Ecstasy/ Designer drugs	Hallucinogen	Cocaine	Inhalants eg halotha solvents	Ketamin	Pethidine	Non prescribed antidepressants
Last 12 months							
Last 4 weeks							

All results will be reported as grouped data and there will be no way of identifying any individual. Results will be published in a refereed journal and selected interim results may be published in WA local bulletins. As we are such a small profession you might wonder if it would be possible for me to personally recognise another member of the profession from their responses (for example someone identifying themselves as a Government veterinarian, over 55 years of age and working with pigs or a University veterinarian over 55 working with dairy cattle). **To overcome this concern I will be asking a non-veterinary statistician to open the returned questionnaires, code and analyse the data to preserve the anonymity of all responses.**

If you wish to obtain more information on this questionnaire or on the results, please contact Helen Fairnie (Jones) on [h.fairnie@curtin.edu.au](mailto:h.fairnie@curtin.edu.au) or telephone (08) 9266 1029 or mobile 040 8958506.

Thank you for participating in this questionnaire



**Appendix F:** Selected results from data linkage of names of registered veterinarians with Health Department of Western Australia's Cancer Registry

Number of neoplasm types recorded in Cancer Registry 1981-2003

Description of cancer type	Count
Neoplasm NOS	2
Squamous cell carcinoma, NOS	3
Sq. cell carcinoma, ker. type, NOS	5
Lymphoepithelial / Nasopharyngeal	2
Basal cell carcinoma, NOS	2
Transitional cell carcinoma, NOS	1
Adenocarcinoma, NOS	11
Adenocarcinoma in villous adenoma	2
Infiltrating duct carcinoma	2
Lobular carcinoma, NOS	2
Granulosa cell tumour	1
Melanoma, NOS	6
Melanoma, regressing	1
Melanoma in Hutch. mel. freckle	2
Superficial spreading melanoma	5
Intradermal naevus / melanoma	1
Epithelioid and spindle cell naevus	1
-Not specified	1
Seminoma, NOS	1
Astrocytoma, anaplastic	1
Glioblastoma, NOS or G. Multiforme	1
Lymphoma, NOS	1
Lymphoma, non-Hodgkin's, NOS	3
Lymphoma, follicular, NOS	1
Multiple myeloma	2
Mast cell tumour/sarcoma	1
Chronic myeloproliferative disease	1
Total	62

NOS is Not Otherwise Specified

**Appendix G:** Results from data linkage of names of registered veterinarians with Health Department of Western Australia's morbidity database (HMDS)

Principal diagnoses in HMDS for all ages & 22 years and older

Principal Diagnosis		No. All	% All	No. >22 years	% >22 years
1	Mental Health* (from HMDS only)	139	4.2	116	4.4
2	Cancer*	147	4.4	139	5.2
3	Infection	66	2.0	37	1.4
4	Metabolic type disease	43	1.3	33	1.2
5	Neurological including migraine	11	0.3	10	0.4
6	Eyes	53	1.6	47	1.8
7	Ears	29	0.9	16	0.6
8	Heart	99	3.0	96	3.6
9	Cerebrovascular	11	0.3	11	0.4
10	Varicose veins and haemorrhoids	61	1.8	56	2.1
11	Nasal/ sinuses	84	2.5	33	1.2
12	Respiratory system/lungs	75	2.3	36	1.4
13	Teeth	196	5.9	75	2.8
14	Oesoph, non-infect.gut, liver & pancreas	261	7.9	226	8.4
15	Appendicitis	44	1.3	23	0.9
16	Hernias	50	1.5	44	1.7
17	Urinary tract	63	1.9	49	1.8
18	Male reproduction	37	1.1	31	1.2
19	Female reproduction	94	2.8	78	2.9
20	Obstetrics/pregnancy	452	13.6	439	16.6
21	Normal Births etc	98	2.9	97	3.7
22	Cellulitis, skin ulcers, skin infections	82	2.5	55	2.1
23	Arthropathies	26	0.8	22	0.8
24	Knee problems	73	2.2	63	2.4
25	Other joint problems	125	3.8	92	3.5
26	Back problems	70	2.1	63	2.4
27	Other abdominal conditions	0	0.0	0	0
28	Fractures	26	0.8	83	3.1
29	Loss of consciousness	26	0.8	9	0.3
30	Trauma and open wounds	69	2.1	43	1.6
31	Burns	8	0.2	3	0.1
32	Neuritis and injuries to nerves incl RSI	17	0.5	17	0.6
33	Poisoning including venoms	28	0.8	14	0.5
34	Zoonoses	7	0.2	7	0.3
35	V codes	261	7.9	236	8.9
36	Congenital	20	0.6	6	0.2
37	Collapse, fever, fainting, nose bleeds	55	1.7	38	1.4
38	Radiation, air pressure, miscellaneous	52	1.6	40	1.5
39	Z codes	167	5.0	163	6.2
40	Miscellaneous	99	3.0	3	0.1
Total Records		3324	100.0	2649	100.0

**Appendix H:** Job satisfaction scale responses using 5 point Likert Scale

Table: Job satisfaction responses using 5 point Likert Scale

Job satisfaction feature	Very dissatisfied %	Dissatisfied %	Unsure %	Satisfied %	Very satisfied %	Total responses (n)
1. Physical work conditions	3.1	16.8	2.0	52.8	25.3	392
2. Freedom to choose own way of working	3.1	11.0	3.3	47.6	35.0	391
3. Fellow workers	0.8	6.8	5.5	51.8	35.2	384
4. Recognition for good work	7.5	21.3	9.5	45.8	15.9	389
5. Immediate boss or partner	5.3	15.0	7.1	43.1	29.5	339
6. Amount of responsibilities	1.9	9.6	4.8	47.1	36.7	376
7. Income or rate of pay	14.6	27.4	5.9	38.9	13.3	391
8. Opportunity to use abilities	3.1	16.8	4.9	48.1	27.1	387
9. Industrial relations	5.2	20.1	13.1	42.8	18.8	383
10. Chance of promotion or pay increase	13.7	32.0	17.5	29.0	7.8	372
11. Out of hours work or being on call	11.3	19.6	4.6	31.6	33.0	373

**Appendix I:** Details of multiple imputation for missing values procedure undertaken for logistic regression using SAS program MIANALYZE on Phase 3 data

## Logistic regression including imputation for missing values Risk of injury and stress in Veterinarians

### Introduction

This analysis uses multiple imputation for missing values to allow all cases to be entered into logistic regression models. By imputing multiple times and then averaging the results, the effect of the imputation on the results is minimised, while maximising the statistical power of the available 419 records.

### Method

For each regression analysis, 10 imputed data sets were produced. Each file was then run through the regression procedure, and the results were combined to give the best overall unbiased estimates of the regression parameters, and to calculate the significance of variables in the models and confidence intervals for the odds ratios accounting for the extra variability introduced by performing imputation.

Missing values were imputed by using the frequency of occurrence of each non-missing value for each variable to estimate the parameters of the underlying binomial distribution and impute the missing values by randomly drawing from this distribution. Values were assumed to be missing at random, and each variable was assumed to be independent of other variables in the data set in respect of whether or not a given value was missing.

The SAS procedure MIANALYSE was used to analyse the results of the multiple imputations. See the SAS papers for details of the methods used.<sup>1</sup>

### Results

#### *Stress at work*

#### *All Veterinarians*

The first model fits the original model from the extract of the thesis on the imputed data. Both factors, Back Injury and Female associate, remain significant although odds ratios are slightly different (Table 1).



**Table 1: Logistic Regression - Risk of Stress, original model**

Parameter estimates						
Parameter	Estimate	Standard Error	t Value	Significance (p value)	Odds Ratio	95% CI
<b>Back injury No or Yes—</b>						
No back injury	0	.	.	.	1.00	
Yes back injury	0.9180	0.2617	3.51	<.001	2.50	(1.50 - 4.18)
<b>Owner/partner or associate * Sex—</b>						
Male owner or partner	0	.	.	.	1.00	
Male associate	-0.06348	0.4731	-0.13	0.893	0.94	(0.37 - 2.39)
Female owner or partner	0.5888	0.4523	1.30	0.194	1.80	(0.74 - 4.38)
Female associate	0.6413	0.3111	2.06	0.039	1.90	(1.03 - 3.50)

Table 2 shows the results of the stress model when all variables, excluding the job satisfaction items, were considered. Younger age, and drug taking the last 12 months were significantly associated with stress, although individual drug variables were not significant. After accounting for these extra variables female associates were no longer significant, and this variable was eliminated from the model. History of back injury also was a significant predictor of stress.

**Table 2: Logistic Regression - Risk of Stress, excluding Job Satisfaction items**

Parameter estimates						
Parameter	Estimate	Standard Error	t Value	Significance (p value)	Odds Ratio	95% CI
<b>Taken any drug in past 12 months—</b>						
No drugs taken	0	.	.	.	1.00	
Taken drugs	1.1465	0.2615	4.38	<.001	3.15	(1.88 - 5.25)
<b>Three age groups—</b>						
Less than 35 years	0	.	.	.	1.00	
35-54 years	-0.3219	0.2641	-1.22	0.223	0.73	(0.43 - 1.22)
55 years or older	-1.2742	0.5410	-2.36	0.019	0.28	(0.10 - 0.81)
<b>Back injury No or Yes—</b>						
No back injury	0	.	.	.	1.00	
Yes back injury	0.8405	0.2661	3.16	0.002	2.32	(1.38 - 3.90)

*Practitioners Only*

The stress logistic regressions were repeated restricting the analysis to 343 vets recorded as practitioners. In terms of variables included in the model the results parallel those from the full data set, however odds ratios have changed slightly (Table 3).

**Table 3: Logistic Regression - Risk of Stress, excluding Job Satisfaction items  
Practitioners only**

Parameter	Parameter estimates					
	Estimate	Standard Error	t Value	Significance (p value)	Odds Ratio	95% CI
<b>Taken any drug in past 12 months—</b> No drugs taken	0	.	.	.	1.00	
Taken drugs	1.0189	0.2779	3.67	<.001	2.77	(1.61 - 4.78)
<b>Three age groups—</b> Less than 35 years	0	.	.	.	1.00	
35–54 years	-0.2618	0.2746	-0.95	0.340	0.77	(0.45 - 1.32)
55 years or older	-2.5840	1.0290	-2.51	0.012	0.08	(0.01 - 0.57)
<b>Back injury No or Yes—</b> No back injury	0	.	.	.	1.00	
Yes back injury	0.8981	0.2867	3.13	0.002	2.46	(1.40 - 4.31)

**Table 4: Logistic Regression - Risk of Stress, including Job Satisfaction items**

Parameter	Parameter estimates					
	Estimate	Standard Error	t Value	Significance (p value)	Odds Ratio	95% CI
<b>Taken any drug in past 12 months—</b> No drugs taken	0	.	.	.	1.00	
Taken drugs	0.4871	0.2561	1.90	0.057	1.63	(0.99 - 2.69)
<b>Three age groups—</b> Less than 35 years	0	.	.	.	1.00	
35–54 years	-0.2732	0.2407	-1.13	0.257	0.76	(0.47 - 1.22)
55 years or older	-1.0812	0.3449	-3.13	0.002	0.34	(0.17 - 0.67)
<b>Back injury No or Yes—</b> No back injury	0	.	.	.	1.00	
Yes back injury	0.4238	0.2217	1.91	0.056	1.53	(0.99 - 2.36)
<b>JS Freedom to do own work—</b> Satisfied	0	.	.	.	1.00	
Dissatisfied	1.1113	0.3982	2.79	0.006	3.04	(1.39 - 6.66)

Parameter estimates						
Parameter	Estimate	Standard Error	t Value	Significance (p value)	Odds Ratio	95% CI
JS Amt of income— Satisfied	0	.	.	.	1.00	
Dissatisfied	0.9938	0.2387	4.16	<.001	2.70	(1.69 - 4.32)

*Practitioners Only*

The stress logistic regressions were repeated restricting the analysis to 343 vets recorded as practitioners. In terms of variables included in the model the results parallel those from the full data set, however odds ratios have changed slightly.

## Injury

### All Veterinarians

A second set of regression analyses were performed to examine risk of injury. Among all veterinarians drug taking, age, and back injuries were significant predictors of injury risk, while mix of animals was borderline significant. Job satisfaction variables were not found to be significant predictors of injury.

**Table 8: Logistic Regression - Risk of injury**

Parameter	Parameter estimates					
	Estimate	Standard Error	t Value	Significance (p value)	Odds Ratio	95% CI
<b>Taken any drug in past 12 months—</b>						
No drugs taken	0	.	.	.	1.00	
Taken drugs	0.4532	0.2425	1.87	0.062	1.57	(0.98 - 2.53)
<b>Three age groups—</b>						
Less than 35 years	0	.	.	.	1.00	
35–54 years	0.6576	0.2342	2.81	0.005	1.93	(1.22 - 3.05)
55 years or older	0.3879	0.3242	1.20	0.232	1.47	(0.78 - 2.78)
<b>Back injury No or Yes—</b>						
No back injury	0	.	.	.	1.00	
Yes back injury	0.8034	0.2119	3.79	<.001	2.23	(1.47 - 3.38)
<b>Animal Types small, large and mixed—</b>						
Small animals	0	.	.	.	1.00	
Large animals	-0.1008	0.3074	-0.33	0.743	0.90	(0.49 - 1.65)
Mixed animals	0.4531	0.2392	1.89	0.058	1.57	(0.98 - 2.51)

*Practitioners only*

The injury analysis was repeated restricted to the 343 practitioners only. Results were similar but one of the job satisfaction variables was found to be significant. Models have been run both with and without this variable.

**Table 9: Logistic Regression - Risk of injury  
Practitioners only**

Parameter	Parameter estimates					
	Estimate	Standard Error	t Value	Significance (p value)	Odds Ratio	95% CI
<b>Three age groups—</b> Less than 35 years	0	.	.	.	1.00	
35–54 years	0.6502	0.2475	2.63	0.009	1.92	(1.18 - 3.11)
55 years or older	0.2961	0.3764	0.79	0.431	1.34	(0.64 - 2.81)
<b>Back injury No or Yes—</b> No back injury	0	.	.	.	1.00	
Yes back injury	0.7544	0.2322	3.25	0.001	2.13	(1.35 - 3.35)
<b>Animal Types small, large and mixed—</b> Small animals	0	.	.	.	1.00	
Large animals	-0.1127	0.4833	-0.23	0.816	0.89	(0.35 - 2.30)
Mixed animals	0.5181	0.2517	2.06	0.040	1.68	(1.03 - 2.75)
<b>JS Fellow workers No or Yes—</b> Satisfied	0	.	.	.	1.00	
Dissatisfied	1.0519	0.4897	2.15	0.032	2.86	(1.09 - 7.49)

**Table 10: Logistic Regression - Risk of injury - Excluding job stress variables  
Practitioners only**

Parameter	Parameter estimates					
	Estimate	Standard Error	t Value	Significance (p value)	Odds Ratio	95% CI
<b>Three age groups—</b> Less than 35 years	0	.	.	.	1.00	
35–54 years	0.6760	0.2454	2.75	0.006	1.97	(1.22 - 3.18)
55 years or older	0.2779	0.3723	0.75	0.455	1.32	(0.64 - 2.74)
<b>Back injury No or Yes—</b> No back injury	0	.	.	.	1.00	
Yes back injury	0.7396	0.2301	3.22	0.001	2.10	(1.33 - 3.29)
<b>Animal Types small, large and mixed—</b> Small animals	0	.	.	.	1.00	

Parameter estimates						
Parameter	Estimate	Standard Error	t Value	Significance (p value)	Odds Ratio	95% CI
Large animals	-0.08509	0.4816	-0.18	0.860	0.92	(0.36 - 2.36)
Mixed animals	0.5174	0.2490	2.08	0.038	1.68	(1.03 - 2.73)

1. Yuan Y. Multiple imputations for missing data: concepts and new developments (P267-25). In: *SAS/STAT Software changes and Enhancements, Release 8.2*. Rockville, MD: SAS Institute Inc.; 2001. p. 332.