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**From lodgement to cover: a qualitative inquiry
into the steps and factors that lead to cover
decision for a leptospirosis claim in New Zealand**

**A thesis presented in partial fulfilment of the
requirements for the degree of Master in
Veterinary Studies**

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Abstract

Leptospirosis is an occupational hazard for people working with animals, and while occupationally-acquired leptospirosis is a compensable condition, the mechanics of the compensation process are not well understood by patients. In addition, much of the crucial decisions affecting the claim outcome are made by treatment providers and insurance claim assessors largely outside of the patient's purview. This lack of understanding adds to the disease burden experienced by patients.

This study was therefore designed to improve the understanding of the compensation process for leptospirosis, by first establishing what are the bases of a claim, and second, investigating how treatment providers and insurance claim assessors evaluate a case or claim. A qualitative approach was utilised in this study. Government reports and publications were analysed in order to determine the formal procedure and requirements of the process, while interviews with treatment providers and insurance claim assessors revealed how the actual process plays out in real life.

The results showed that a claim is assessed against two main requirements: having a confirmed diagnosis and having an appropriate exposure. A claim must have sufficient information to support both of these requirements. The criteria for the exposure are set in legislation, but the diagnostic criteria may vary depending on which case definition is used. The results from the study showed that the assessment may be affected by factors like physician experience, laboratory test preference, and patient and employer compliance.

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Table of Contents

ABSTRACT	I
ACKNOWLEDGEMENT	II
DEFINITION OF TERMS.....	1
INTRODUCTION AND STRUCTURE OF THE REPORT.....	3
CHAPTER 1	4
1.1 OCCUPATIONAL LEPTOSPIROSIS IN NEW ZEALAND	5
1.1.1 LEPTOSPIROSIS OVERVIEW	5
1.1.2 DIAGNOSIS OF LEPTOSPIROSIS	7
1.1.3 LEPTOSPIROSIS AS AN OCCUPATIONAL HAZARD IN NEW ZEALAND	9
1.1.4 THE DISEASE BURDEN OF OCCUPATIONALLY-ACQUIRED LEPTOSPIROSIS IN NEW ZEALAND .	10
1.1.5 THE “HIDDEN COST” OF OCCUPATIONALLY ACQUIRED LEPTOSPIROSIS	11
1.2 WORKER COMPENSATION AND ACCIDENT COMPENSATION CORPORATION OR ACC	13
1.2.1 ACC OVERVIEW	13
1.2.2 WORKER COMPENSATION WITHIN THE ACC SCHEME	16
1.2.3 ACCREDITED EMPLOYERS AND THIRD-PARTY ADMINISTRATORS	17
1.3 COMPENSATION OF OCCUPATIONAL LEPTOSPIROSIS	20
1.3.1 COVER VERSUS ENTITLEMENT	20
1.3.2 COVER FOR OCCUPATIONAL DISEASES AND THE ISSUE OF CAUSATION.....	21
1.3.3 LEPTOSPIROSIS AS A SCHEDULE 2 INJURY	24
1.3.4 CASE DEFINITIONS FROM MOH AND ACC	24
1.3.5 NEED FOR MEDICAL ASSESSMENT	26
1.3.6 LEGISLATIVE TIME FRAME	26
1.3.7 LEPTOSPIROSIS CLAIMS STATISTICS	27
1.4 CHAPTER SUMMARY	28
CHAPTER 2	29
2.1 METHODS	30
2.1.1 STUDY GENESIS AND DEVELOPMENT OF THE RESEARCH QUESTION	30
2.1.2 STUDY DESIGN.	31
2.1.3 DATA COLLECTION.....	32
2.1.4 ETHICAL CONSIDERATIONS	33
2.1.5 SAMPLING STRATEGY	33
2.1.6 RECRUITMENT OF TREATMENT PROVIDERS	34
2.1.7 RECRUITMENT OF MEDICAL ADVISORS.....	35
2.1.8 PREPARATION AND CONDUCT OF INTERVIEWS	36
2.1.9 INTERVIEW TRANSCRIPTION	37
2.1.10 DATA ANALYSIS	38
2.1.11 METHODS REFLECTIONS.....	40
2.2.1 LEPTOSPIROSIS CLAIMS PROCESS – FROM CLAIM INITIATION TO COVER DECISION	41
2.2.2 INTERVIEW FINDINGS – TREATMENT PROVIDERS	45
2.2.3 INTERVIEW FINDINGS – CLAIMS ASSESSORS (INSURANCE MEDICAL ADVISORS AND THE TEAM MANAGER OF ACC’S GRADUAL PROCESS CASE COORDINATORS).....	50
2.3 DISCUSSION	56
2.3.1 KEY FINDINGS ABOUT SPECIFIC STEPS IN THE PROCESS	56
2.3.2 KEY FINDINGS ABOUT THE FACTORS THAT AFFECT THE PROCESS	57
2.4 CHAPTER SUMMARY	65
CHAPTER 3	66
3.1 SUMMARY OF THE STUDY FINDINGS	67

3.2 STUDY REFLECTIONS AND RECOMMENDATIONS.....	68
REFERENCES.....	70
APPENDIX 1 LOW RISK ETHICS NOTIFICATION LETTER.....	78
APPENDIX 2 ACC OIA RESPONSE.....	79
APPENDIX 3 INTERVIEW QUESTIONS FOR THE TREATMENT PROVIDERS.....	87
APPENDIX 4 INTERVIEW QUESTIONS FOR THE MEDICAL ADVISORS.....	89
APPENDIX 5 PARTICIPANT INFORMATION SHEET AND CONSENT FORM.....	91

Definition of Terms

- AC Act 2001 – refers to the prevailing Accident Compensation Act 2001.
- ACC – in this text, it may refer to the Accident Compensation Corporation as an entity, to the scheme that it oversees, or to the standing principal Act (see AC Act 2001).
- Act – unless otherwise stated, all standalone references to ‘Act’ in this text pertain to the Accident Compensation Act 2001 (see AC Act 2001).
- AE – Accredited Employers; refers to employers who are members of ACC’s Accredited Employer Programme.
- AEs/TPAs – refers jointly to both Accredited Employers and third-party administrators (see TPA below); this term is used in this text to refer to both as a joint entity that is distinctly separate from ACC.
- Case coordinator – refers to the insurance personnel who serves as the first point of contact for the claim; the case coordinator is tasked with obtaining further information for assessing the claim and for determining if cover is warranted.
- Case definition – refers to the set of criteria for diagnosing leptospirosis.
- Claim assessors – refers to insurance personnel who are tasked with assessing a claim to see if it is eligible for cover; in this text, it will refer to both case coordinators and medical advisors.
- Compensation – see Entitlements.
- Cover – Cover is defined in Section 8 (2) of the AC Act 2001: “When this Act says that an injury *is covered by this Act*, it means that the injury is a personal injury for which a claimant has cover”. In other words, the provisions for injury (see AC Act 2001 Section 20 (2), Sections 26 to 30, 32, 35) and provisions for cover (see AC Act 2001 Sections 20 to 24 and 34) are satisfied and the claimant is entitled to claim compensation. Cover is the first step in the life of a claim, for without cover, no compensation will be awarded.
- DoL – Department of Labour; was previously the Crown entity tasked with administering labour laws. The use of this term in this text is in

reference to a 2007 DoL report entitled *Leptospirosis: Reducing the impact on New Zealand workplaces* (Keenan, 2007).

- ELISA – Enzyme-linked immunosorbent assay; a laboratory test that detects antibodies produced against leptospires. ELISA tests are further described based on the type of antibodies it detects, e.g. an ELISA tests that detects IgM antibodies is called an IgM-ELISA.
- Entitlements – refers to the types of compensation provided by AC Act 2001 Section 69. A claimant may receive any one or all of the types of entitlements, depending on their injuries and needs.
- MAT – Microscopic agglutination test; a laboratory test that detects antibodies produced against leptospires.
- Medical advisor – a physician who is employed by an insurer to offer advice on the medical information related to a claim.
- MoH – Ministry of Health.
- PCR – Polymerase chain reaction; a laboratory test that detects the presence of leptospiral nucleic acid.
- TPA – third party administrators; these are private insurance brokers or companies that an Accredited Employer can hire to manage their workplace claims instead of ACC.
- Treatment providers – refers to both primary care physicians (e.g. General practitioners or GPs) and secondary care physicians (e.g. hospital-based physicians). The compensation process for leptospirosis requires the involvement of treatment providers.
- WorkSafe – New Zealand’s primary workplace health and safety regulator.

Introduction and structure of the report

Leptospirosis is the most common occupational zoonosis in New Zealand. Working with animals, especially livestock, is a recognised risk factor for the disease, and majority of the reported cases are farmers, farm workers, and abattoir workers. Most cases of leptospirosis manifests as a mild, non-specific acute infection, but a proportion of patients may develop severe, life-threatening symptoms like shock or kidney failure. Severe leptospirosis often requires intensive care and hospitalisation. Recovery from severe leptospirosis can take weeks or months, during which time patients may be too ill to work.

People who contract the condition from work activities or work environment are eligible for compensation under the Accident Compensation Act 2001. However, previous studies of occupationally-acquired leptospirosis have found that workers had poor knowledge of the compensation requirements and report dissatisfaction with the system of compensation. This project was therefore conceived as a way to improve the understanding of the whole compensation process for leptospirosis, by focusing on the steps of claim initiation and cover assessment.

Due to the medical nature of a leptospirosis claim, those two steps require the involvement of treatment providers and medical advisors. What is more, the outcome for a leptospirosis claim largely depends on the actions and decisions made by these two key actors. For these reasons, the focus of this qualitative, exploratory study largely revolves around the decision-making criteria of said key actors.

The report is divided into three chapters. The first chapter provides context into how leptospirosis fits into the general system of worker compensation in New Zealand and then establishes the bases for a leptospirosis claim. The second chapter presents the study methods and results, and then discusses the results in relation to the research question. The third chapter contains a summary of the study findings and the recommendations and suggestions for future research.

Chapter 1

Setting the context

This chapter provides context to this study, using information from published literature and publicly-available government reports and documents as well as the information requested from ACC under the Official Information Act (see Appendix 2 ACC OIA response). This chapter is split into three sections: the first discusses leptospirosis as an occupational hazard in New Zealand and highlights its consequences on workers, the second gives an overview of ACC as whole, while the third section details the specifics of a leptospirosis claim – its legislative basis and diagnostic criteria as well as a recent history of leptospirosis claims. The goal of this chapter is to describe key components of the context in which leptospirosis claims are assessed in New Zealand.

1.1 Occupational leptospirosis in New Zealand

1.1.1 Leptospirosis overview

Leptospirosis is a global zoonotic disease caused by the bacteria *Leptospira*. The bacteria are maintained in reservoir animal hosts and human cases result from direct contact with the urine of an infected animal or indirect contact via soil or water contaminated with urine from an infected animal (Haake & Levett, 2015). The bacteria can enter through cuts and cracks in the skin, e.g. through bare hands or feet, or through the mucous membranes like those in the eyes, nose, or mouth. Persons whose occupation puts them in contact with potentially infected animals, such as farm workers, abattoir workers, veterinarians, sewer workers, hunters and trappers, etc. are recognised to be at high risk for getting the disease (Haake & Levett, 2015). Other terms for leptospirosis – swamp fever, mud fever, field fever, swineherd’s disease, and cane-cutter fever (WorkSafe, 2015, p. 6) – point to both its common presentation as a fever and to its vocational association.

Historically, leptospires have been classified according to their phenotypic characteristics (e.g. pathogenicity) and then further sub-classified according to their serological reactions, resulting in more than 200 different serovars (Haake & Levett, 2015, p. 12). In recent decades however, genotype-based classification has started to replace serovar classification (Vincent et al., 2019), although the latter system is still widely used in the clinical diagnosis and epidemiological profiling of the disease (Bharti et al., 2003). Some serovars have typically been associated with certain animal hosts, but this association is in no way absolute and is affected by the diversity and interaction of the animal and human populations in an area (Adler & de la Peña Moctezuma, 2010; Levett, 2001) and varies greatly by region (Bharti et al., 2003).

Costa et al. (2015, p. 10) estimates 1.03 million cases occur worldwide each year, causing an estimated 58,900 deaths. Most cases of leptospirosis manifest as a mild, non-specific acute infection, and a proportion of infections may be inapparent or subclinical (Bharti et al., 2003). Incubation period averages 5 to 14 days but can range from 2 to 30 days (Ko, Goarant, & Picardeau, 2009, p. 3). Common symptoms include fever, chills, myalgia, and headaches; some patients may also experience non-productive cough, abdominal pain, nausea, vomiting, and diarrhoea. The acute infection normally lasts about a week (Ko et al., 2009; Spichler, Athanzio, Seguro,

& Vinetz, 2011). Leptospirosis is widely acknowledged to be an under-reported disease, as cases that manifest as a mild, acute, self-limiting infection with generalised symptoms would not often cause people to seek medical attention, and therefore the recorded incidence most likely represents a small portion of the true number of leptospirosis cases (Goris et al., 2013).

People who do seek medical attention are often severely affected. Severe cases are estimated to make up 5-10% of globally recorded human infections (Costa et al., 2015, p. 12). Severe leptospirosis is a potentially fatal condition characterised by multiple organ dysfunction, most commonly involving the liver, lungs, and kidneys (Haake & Levett, 2015). Weil's disease is a known severe form that typically involves a combination of jaundice and renal failure (Haake & Levett, 2015). Other serious manifestations include pulmonary haemorrhage leading to acute respiratory distress syndrome, myocarditis, and shock (Spichler et al., 2011). Severe leptospirosis can have high fatality rates, especially in developing countries, but early initiation of antibiotic treatment has been shown to reduce illness duration and severity (Bharti et al., 2003). A high degree of clinical suspicion, along with early diagnosis to distinguish it from viral infections, is therefore critical in managing the disease.

The majority of leptospirosis cases resolve completely; however, there is growing recognition that some patients experience long-term symptoms. Torgerson et al. (2015, p. 4) defined chronic sequelae as likely to be lasting longer than two months, although some patients have reported suffering symptoms for years (Levett, 2001; Weston, Mocke, Collins-Emerson, & Benschop, n.d.). A study in the Netherlands reported that 68 out of 225 laboratory-confirmed patients (30.2%) complained of persistent symptoms, with 12 patients experiencing symptoms more than 24 months after being discharged (Goris et al., 2013). The most frequently reported symptoms were what the authors called depression-compatible complaints (e.g. extreme fatigue, headaches, and malaise) and those related to chronic pain (e.g. myalgia and joint pains).

Other reports of long-term symptoms include a study where 11 patients were re-evaluated for possible delayed sequelae after recovery from acute leptospirosis (Levett, 2001, p. 306); four out of the 11 patients complained of persistent headaches

while two reported visual problems; the duration of persistent symptoms for that study ranged from 6 to 34 years. Another study of hospitalised patients in Brazil found two out of 47 patients still had complaints more than two months after being discharged – one still had profound general malaise after one year while another was diagnosed with new-onset panic disorder after his bout of acute leptospirosis and needed medication for more than six months (Spichler et al., 2011). However, despite the number of reported cases through the years, the mechanism and causal association for chronic symptoms remain poorly understood (Spichler et al., 2011).

1.1.2 Diagnosis of leptospirosis

As mentioned above, the generalised symptoms of leptospirosis, especially in its early stages, makes it clinically difficult to distinguish from other causes of acute febrile illness (Torgerson et al., 2015). Treatment providers rely on a high index of suspicion, taking into account the patient's risk factors, exposure history, and presenting signs and symptoms (Haake & Levett, 2015).

Laboratory confirmation is needed to validate the diagnosis, but interpretation of the laboratory results also requires knowledge of which tests are appropriate for each phase of the disease. Unsuitable tests using incorrect samples taken at inappropriate times may lead to misdiagnosis (Musso & La Scola, 2013).

Laboratory tests for leptospirosis are the following:

- isolation and culture of leptospires from bodily fluids (blood, urine or cerebrospinal fluid),
- molecular detection of bacterial nucleic acids (e.g. PCR), and
- serological tests that detect antibodies produced against the bacteria (e.g. MAT and ELISA).

Culture is not often used in therapeutic management, as it may take months before results can be obtained and is therefore no help for getting an early diagnosis. Serological tests and nucleic acid detection tests are more suited for rapid diagnosis; but the suitability of tests and samples vary depending on the stage or phase of the disease.

Leptospirosis is said to be biphasic: first, an acute phase characterised by leptospiraemia (presence of leptospires in the blood), and then an immune phase characterised by antibody production and excretion of leptospires in the urine (Levett, 2001). Leptospiraemia begins before the onset of symptoms, and usually tapers off beyond week one of illness. Blood sample collection for culture and PCR should be made at this stage because this is when leptospires are present in the blood; when blood for isolation or PCR is taken beyond this phase, it may produce false negative results and lead to misdiagnosis. An accurate retelling of symptoms onset helps treatment providers estimate which phase or stage the patient is likely in.

After leptospiraemia, the immune phase begins, usually starting from week two and beyond; this is when serological tests like ELISA and MAT are more appropriate because it can take a couple of weeks before antibodies build up to detectable levels in the blood. The antibody titre gradually increases as the disease progresses, before peaking and then decreasing after recovery. Low titres could indicate either the very early or the late stage of the immune phase (World Health Organization, (WHO), 2003) and is why paired serum samples are recommended, in order to improve diagnostic certainty. If the date of symptoms onset can be precisely determined, an interval of 3-5 days between samples may be adequate, but in most cases, a 10-14 days interval is more appropriate (Haake & Levett, 2015, p. 83).

MAT has historically been the gold standard test but preference for ELISA and PCR is increasing. Both tests are more novel and simpler to perform than MAT. MAT needs more specialised facilities and that has led to fewer laboratories capable of performing MAT compared to ELISA or PCR (WHO, 2003). Another advantage of the newer tests is that they may be used earlier than MAT: days 5-10 for PCR and days 6-8 for ELISA (Musso & La Scola, 2013, p. 248) versus days 10-12 for MAT (WHO, 2003, p. 78). However, both PCR and ELISA tend to become negative faster than MAT (Musso & La Scola, 2013). MAT is also capable of detecting both IgM and IgG type antibodies while most ELISA tests for use in early stages are IgM-specific (WHO, 2003).

The later stage of the immune phase may also give rise to bacterial shedding in the urine. Urine samples for culture and PCR may be used at this stage but it should be noted that leptospires die quickly in the urine – WHO (2003, p. 81) recommends the

sample to be processed within two hours. Other things to consider when interpreting urine PCR results are that humans do not effectively shed bacteria in the urine (Ko et al., 2009, p. 25) and that antibiotic treatment (particularly doxycycline) has been shown to prevent bacterial shedding (Haake & Levett, 2015, p. 85).

In summary, laboratory results are crucial for confirming diagnosis. However, they must be considered in conjunction with the probable stage of the disease, and a negative result may not always mean that the disease is absent.

1.1.3 Leptospirosis as an occupational hazard in New Zealand

Leptospirosis is New Zealand's most commonly notified occupational infectious disease (Borman & Xu, 2015, p. 6), with the majority of cases coming from people working in occupations related to the farming or meat processing industry (El-Tras, Bruce, Holt, Eltholth, & Merien, 2018, p. 165). The first cases of leptospirosis in New Zealand were reported on a farm in 1951, where at least six calves died and six human patients were hospitalised (El-Tras et al., 2018, p. 162). The number of reported cases grew from that first report, and at its peak in the 1970s, more than 800 cases were being reported annually (Dorjee, 2007, p. 42). A widespread animal vaccination campaign in the 1980s is widely attributed to have brought the annual incidence down in the following decades: 4.4 cases per 100,000 from 1990-8 (Thornley, Baker, Weinstein, & Maas, 2002, p. 29) and 2.2 cases per 100,000 from 2001-14 (Sanhueza, Heuer, Wilson, Benschop, & Collins-Emerson, 2017, p. 371).

Eighty percent of the notified cases from 2001-14 were meat plant workers, dairy farmers, and other types of livestock farmers or farm workers (Sanhueza et al., 2017, p. 371). In 2017, there were 142 notified cases of leptospirosis; 128 of which reported their occupation; 91 of the 128 cases (71.1%) were patients working in high-risk occupations such as farmers, farm workers, livestock transporters, and meat plant workers (ESR, 2019, p. 26).

An analysis of notified leptospirosis cases from 1990-98 by Thornley et al. (2002, p. 29) showed that while the overall annual incidence for the whole population was 4.4 per 100,000 persons, for meat workers and livestock farmers, the annual incidence was 163.5 per 100,000 (a 37-fold increase over the general population) and 91.7 per 100,000 (a 20-fold increase), respectively. Thornley et al. (2002, p. 34) went on to

estimate that within a 30-year career period, a meat worker has a 1:20 chance of developing a severe case of leptospirosis while a male dairy farm worker's chances range from 1:14 to 1:28.

Because of leptospirosis' well-established zoonotic and occupational risk, the disease is notifiable under the Health Act 1956 and regarded as a significant hazard under the Health and Safety in Employment Act 1992 (WorkSafe, 2015). Attending medical practitioners and laboratories who encounter a suspected case of leptospirosis are required to immediately give notice, even without confirmation, to the local medical officer of health (MoH, 2017). The medical officer of health in turn is required to notify WorkSafe of confirmed cases if they believe them to be work-related (Health and Safety at Work Act 2015 Section 199).

Despite its status as a notifiable disease, leptospirosis is still believed to be widely unreported. The Worksafe *Guidelines for the Prevention and Control of Leptospirosis* (WorkSafe, 2015, p. 10) notes that the actual cases may be 16-56 times higher than the reported number, as a large number of cases are either undiagnosed or misdiagnosed by patients and doctors for flu.

Reported cases come from patients who feel unwell enough to seek medical attention, and these are often patients who experience severe symptoms and may require hospitalisation. Of the notified cases in 2017 with a recorded hospitalisation status (140 out of a total 142 notified cases), 63.6% (89/140) were hospitalised (ESR, 2019, p. 26). Severe leptospirosis can lead to fatalities, but deaths attributed to leptospirosis are rare in New Zealand (Dreyfus et al., 2014).

1.1.4 The disease burden of occupationally-acquired leptospirosis in New Zealand

The health effects of severe leptospirosis do not immediately disappear upon hospital discharge. Keenan, in a 2007 report for the Department of Labour (DoL) on the impact of leptospirosis on New Zealand workplaces, noted that some patients may take 3–4 weeks to 6–8 months off from work (p.18). The WorkSafe (2015) Guidelines for leptospirosis recognises that

“Most people who are severely affected find it physically impossible to return to work within two months. Most do return to work but it can be at least a year before they regain the energy they had before becoming ill” (p.13)

The WorkSafe Guidelines also acknowledges that some patients suffer long-lasting recurring symptoms, such as depression or muscle pains, and may have repeat hospital admissions over a period of years. (Everts, 2009) reported 12 patients from New Zealand and Australia that were diagnosed with a chronic fatigue syndrome (CFS) following an acute leptospirosis infection. The duration of CFS for the 12 patients range from six months to more than four years after the acute infection. Another study (Weston et al., n.d.) described five patients who reported experiencing persistent symptoms lasting at least six months after the acute infection. They described symptoms include chronic fatigue, headaches, body pain (especially back and legs), intolerance to light, mood swings, and weight loss. The patients in both studies were all working in occupations related to either meat works (abattoir worker or butcher) or farming when they acquired the infection, and all reported substantial disruption to their work and personal lives as a result of the long-term sequelae.

This disruption of work has financial consequences; the 2007 DoL report calculated the direct cost of one case of leptospirosis in the meat industry to be \$7,500 (Keenan, 2007, p. 19). In 2016, (Sanhueza, p. 107) estimated that the annual national cost to NZ of leptospirosis (lost wages plus treatment costs) for abattoir workers, farmers, and veterinarians was \$3.99 million. An argument could be made that the amount is an over-estimation – the treatment cost was based on the average cost of a leptospirosis claim from ACC, which would already factor in cost of wages; therefore the cost for lost wages might have been accounted twice – however, if the indirect costs of the disease are included into the total costs of suffering, the amount may well surpass that estimate.

1.1.5 The “hidden cost” of occupationally acquired leptospirosis

Indirect costs are difficult to define, but the concept may be easier to understand by looking at indirect costs as all other costs except direct costs. Butcher (2002, p. 67) defines direct costs as “visible, tangible costs that appear on the accounting balance”, meaning they are quantifiable and identifiable. In contrast, indirect costs are

“invisible, intangible costs that are real but have no dollar value assigned to them”, i.e. they are subjective and incalculable. Indirect costs have been estimated as being three to eight times as high as direct costs (Driscoll et al., 2004, p. 13; Keenan, 2007, p. 19)

For occupationally-acquired leptospirosis, some of these indirect costs were identified by Adams (2002). Adams interviewed ten workers (of which eight were meat workers while the remaining were a farmer and an animal transporter) on the effects the illness has had on their personal lives, their families, and their workplaces. Adams called these health, social, psychological and economic consequences as the “hidden cost” of occupationally acquired leptospirosis. Some of these findings are as follows:

- All ten patients still suffered from ongoing symptoms such as fatigue, migraines, irritability and depression (p71). Despite the persistent fatigue, eight out of the ten went back to work within four months of the infection. For most, this was because they had run out of sick leave and had yet to receive compensation (p 101).
- The ongoing symptoms have impacted on their mental health (e.g. increased mood swings, being more irritable) which in turn has affected their familial and social relationships.
- There was a pervading finding of participants feeling “not as strong as before” (p72, 75). All patients report a reduction or loss of their previous ability to engage in work or leisure activities that they used to participate in before (e.g. sport); this has led some to change their work (p 69) or lifestyle (p75).
- In the periods when they were off-work, the participants had less social interaction and felt increased isolation (p95).
- In some, the inability to work has led to a lower self-esteem because of the loss of a socially-valued role (p 95); this was exacerbated in those who did not receive compensation and had to apply for unemployment or sickness benefit, which they felt to be “degrading” (p75).

Adams (2002) found that for most of the participants, their experiences with compensation contributed to the overall negative experience of the disease. The compensation-related stress the participants experienced was both financial and emotional. Some felt that the compensation was too complicated, unnecessarily lengthy, and was unsympathetic to persons who were already ill. It was also found that for those participants whose claim was denied or in dispute, no concessions about their ill health were made once they returned to work, even though some of them were still feeling the effects of the illness.

Five of the participants encountered delays in getting their claims recognised as work-related by the insurer while three had their claim denied. For some, the delay or claim denial was due to the bureaucratic nature of some of the claim requirements, e.g. need to rule out other exposures, need for multiple testing, long waiting time for the laboratory results. For others, the delay was caused by employers disputing the claim.

Adams (2002) attributed the delays and disputes to leptospirosis being a poorly understood disease, not just by employers but also by the participants and treatment providers. The participants also appeared to have limited knowledge of how the compensation system works. The same observations were made by Keenan (2007) in the DoL report. This twin lack of knowledge of the disease as well as of the compensation process contributed to feelings of “powerlessness” by the participants and added to their stress (Adams, 2002, p. 113).

1.2 Worker Compensation and Accident Compensation Corporation or ACC

1.2.1 ACC overview

In developed countries, worker compensation is synonymous with insurance, and the same is true for New Zealand. What makes New Zealand unique from other countries, however, is the state monopoly that is the Accident Compensation Corporation or ACC, a legally mandated governmental entity charged with providing a 24-hour, no-fault, accident compensation scheme for all persons in the country.

The ACC era began with the enactment of the Accident Compensation Act 1972, as it was that particular act that created both the scheme and the entity that gave it its

name, the Accident Compensation Commission (later renamed as the Accident Compensation Corporation). There have been many amendments of the principal act throughout the years, namely,

- the Accident Compensation Act 1982,
- the Accident Rehabilitation and Compensation Insurance Act 1992,
- the Accident Insurance Act 1998, and
- the Injury Prevention, Rehabilitation, and Compensation Act 2001 which was later renamed to Accident Compensation Act 2001 and serves as the prevailing act.

However, the overriding principle of a 24-hour, no-fault, comprehensive compensation scheme persists from its inception up to the present day. The main features of the scheme are as follows:

First, the scheme covers injuries from accidents of any kind. The scheme takes care to highlight what it means by *accident*, the exact parameters of which are set in AC Act 2001 Section 25, but loosely speaking, an *accident* refers to a specific event or sequence of events that is “unexpected and unintended” (Campbell, 1996, p. 100). Over the years, the scheme has broadened to include cover for certain cases of mental injuries and treatment injuries (i.e. injuries contracted in the context of medical treatment). What has stayed the same is the distinction between injuries that can be traced to an accident, i.e. covered, and injuries caused by gradual processes like illnesses or ageing, i.e. not covered except for occupational diseases. Occupational diseases are diseases due to the nature of a person’s employment (Dew, 2002, p. 164). Provisions relating to occupational diseases will be discussed in later sections.

The second feature of the ACC scheme is that any person in New Zealand who suffered an injury that is covered under the Act can claim compensation.

The third feature is the *no-fault* nature of the scheme such that injury is the sole criterion for compensation. So long as the injury is proven to be an injury covered under the Act, then compensation is awarded regardless of fault. The focus then shifts from fault to cause; and causation becomes the pre-requisite for cover (Duffy,

2003). This emphasis on causation is even more important in the context of occupational diseases and will be discussed in later sections.

The fourth feature of the scheme is what is often referred to as a social contract, where, in return for a system that provides greater certainty and speedier and more extensive compensation, New Zealanders gave up the right to sue for damages for all injuries covered by the Act. This social compromise has remained in place since the scheme's inception, although an exception for exemplary damages was included in the latter acts.

Another side to this contract and the last feature of the scheme is that people no longer have the option of picking insurance providers. The law made it so that ACC is the sole provider for accident compensation. ACC, the corporation, is responsible for the management of the scheme. Essentially, that means determining cover, providing entitlements, and overseeing funding of the scheme (AC Act 2001 Sec 165, 262). These duties are similar to insurance services, but the law is adamant that even though it provides insurance-related services, it is "not a function of the Corporation...to provide insurance" (AC Act 2001 Act Sec 262 (2)). Tennent (2012, p. 5) explains that this distinction is because the Act made compensation a legal right, compared to merely a contractual obligation, and that unlike true insurance, the policy owner cannot negotiate the terms of the policy (Vennell, 1993 in Campbell, 1996; Wilkinson, 2003). Others have argued that the distinction is merely a matter of semantics (Campbell, 1996) this paper follows the latter view and will at times use the term insurer to also refer to ACC.

ACC's statutory origin and identity has meant that, unlike profit-oriented insurance companies, its role as a provider of insurance-related services is overlaid with a broader purpose of social welfare. This dual purpose has led to the scheme becoming increasingly comprehensive and complex; and within this behemoth of a scheme, resides the current worker compensation system. While the ACC scheme as a whole was heralded as a revolutionary social policy, in terms of worker compensation, many of its features closely resemble those of market-based insurance systems.

1.2.2 Worker compensation within the ACC scheme

Despite being only one part of the whole ACC scheme, worker compensation was actually the antecedent to the whole scheme. The establishment of ACC directly stems from recommendations aimed at improving the system of worker compensation.

The pre-ACC compensation system was dominated by privately-run insurance companies. Criticisms levelled at that system were about its administrative inefficiency leading to waste and delays as well as its prioritisation of profit over compensation (Woodhouse, Bockett, & Parsons, 1967, pp. 80-81). For example, around 40% of the total costs was consumed by insurance companies to cover their expenses and gain a reasonable margin of profit (Woodhouse et al., 1967, p. 89). In addition, because the prevailing act of that time, the Workers Compensation Act, contained a fault clause where no compensation was paid out if the injury was attributed to the worker's own misconduct (WCA 1956 sec 34), this produced an adversarial relationship between workers and employers. The benefits under WCA were also criticised to be meagre in value with a limited duration of six years (Woodhouse et al., 1967).

ACC was designed to address those issues, and the scheme's origin can be directly traced to a 1967 Royal Commission of Inquiry Report (more commonly referred to as the Woodhouse report, after its chairman, Sir Arthur Owen Woodhouse) that was formed in response to the growing discontent with the worker compensation system of that time (Todd, 2011). Woodhouse et al. (1967 p. 39-41, p.177-178) recommended a scheme that was founded on these five principles:

- Community responsibility – because society benefits from the productive work of its members, then it also becomes society's responsibility to help in the recovery of its injured members;
- Comprehensive entitlement – the entitlements due to those injured members should be assessed uniformly, regardless of the cause of their injury;
- Complete rehabilitation – rehabilitation not just in terms of financial restitution but also restoration to the maximum degree possible of bodily health and vocational utility;

- Real compensation – adequate recompense means addressing not only the income loss, but also any physical impairment that may affect the person’s ability to earn in the future, and
- Administrative efficiency – the distribution of benefits should be hampered by “delays in compensation, inconsistencies in assessment, or waste in administration” (p.178).

An independent review of ACC in 2008 conducted by PricewaterhouseCoopers Australia (PwC) seems to indicate that the ACC system has partially succeeded in its goals:

“New Zealand has lower claims management expenses... than all Australian schemes, and lower total administration expenses... than the schemes providing comparable benefits... It is clear that ACC is paying a relatively high portion of total premiums directly to claimant benefits.” (Tess, Walsh, & Feyer, 2008, p. xiii).

This overall favourable assessment of ACC, in comparison with other worker compensation systems was also echoed by (Lippel, 2012). However, the ACC scheme has also seen many amendments since its founding, and numerous authors have remarked that the amendments have led to a dilution of the Woodhouse principles by re-introducing some features of the pre-ACC system (Duffy, 2003; Gaskins, 2015; Kreber, 2007). Two prime examples of such features are the Experience Rating Programme (ERP) and the Accredited Employers Programme (AEP).

1.2.3 Accredited Employers and Third-party administrators

The ERP and AEP¹ were both introduced into the scheme by the 1992 Act. ACC considers the two programmes separate; however, the rationale for both programmes are similar and both provide ways for employers to obtain a discount on their Work levy.

¹ AEP first appeared in the 1992 Act as ‘Self-insurance’ (Birch, 1991, p. 28); the programme name has changed in the subsequent laws (from ‘Exempt employers’ to ‘Accredited employers’) but the concept and overall structure has remained the same.

The Work levy is what employers and self-employed persons pay to fund the Work Account, which in turn funds the compensation for all work-related injuries. The Work levy is to ACC what an insurance premium is to a private insurer. One of the variables ACC uses to calculate² a company's levy is an *industry-based risk*; and because this is an industry-specific rate, all business within an industry will have the same flat rate, regardless of the individual company's safety record. One criticism against this method for calculating levies is that, unlike insurance premiums, it does not take into account the status of the health and safety of the workplace (Lamm, McDonnell, & John, 2012, p. 25).

This is where experience rating comes in; under the ERP, employers can obtain a discount on their Work Levy by leveraging their individual safety record. In theory, this incentivises employers to improve their business practices and make it safer. Experience or merit rating is a common feature in market-based insurance systems (Lamm et al., 2012). However, there are concerns that experience or merit rating, instead of encouraging employers to invest in safer workplace practices and environment, would instead incentivise employers to contest claims as non-work related (Lippel, 2012, p. 528). Merit rating was also considered by Woodhouse et al. in their 1967 report, but they ultimately concluded that it was an ineffective means of promoting safety (p. 140).

The current ERP allows employers to get as much as 50% discount on their levy (ACC, 2019b). But for employers who wish to reduce their levies even more, they could join the AEP. Under the AEP, employers enter into an Accreditation Agreement (AC Act 2001 Section 184) with ACC, wherein they shoulder the administration and costs of providing compensation for the work-related injuries of their employees, in return for a much-reduced levy (as much as 90% reduction). Administration or management of the claims means determining cover and providing entitlements (AC Act 2001 Section 187). The AEP allows the Accredited Employer (AE) to “stand in ACC's shoes” and make decisions about the claim (ACC, 2019a, p. 6). AEs can choose to either manage the claims on their own (i.e. self-insure) or

² ACC calculates the levy based on three variables:

- the individual liable earnings of the business,
- the industry-based risk of work injuries, and
- the cost to the scheme [ACC Paying Levies].

contract it out to the third-party administrators (TPAs). In effect, the AEP allows employers to opt-out of having ACC as the default provider for work-related injuries and gives them back the freedom to choose their insurance provider.

AEP is open to any employer who can meet and maintain the entry requirements, but ACC recommends that the savings potential particularly applies to employers with annual Work levies over \$250,000 (ACC, 2019a, p. 4). Lamm et al. (2012, p. 26) notes that in 2007, around 25% of the country's full-time workforce was under the AEP.

AEs/TPAs are bound by the same legislation and regulations as ACC, and they are expected to manage claims in accordance with the standards and timeframes set in legislation; i.e. their management must not infringe upon the entitlements and the rights conferred by the Act (ACC, 2017). However, they are not bound by ACC policy and may have their own claims management policies and procedures. ACC conducts an annual audit of their procedures but does not specifically monitor claims managed by AEs/TPAs (Appendix 2 ACC OIA response). For this project, the ACC policies and procedures will serve as the default claim process. This is because each AEs/TPAs will have their own set of procedures, but they are expected to mirror or resemble the ACC template.

When AEP was first introduced into the 1992 Act, it was called “the purest form of experience rating³” (Birch, 1991, p. 28). ACC still promotes AEP as a way of offering employers “real incentives to adopt effective injury prevention and rehabilitation initiatives” (ACC, 2019a, p. 6). However, there are apprehensions that the programme creates a danger where the employer will provide compensation at minimum cost, rather than in a manner which is consistent with the purpose of the scheme (Tennent, 2012). Indeed, Lamm et al. (2012) consider the AEP as less of a workplace improvement measure and more of a cost-savings measure for companies.

A literature search found no study that specifically compared the compensation experience and outcome for workers under the ACC scheme versus AEP scheme,

³ If the possibility of a discounted levy under ERP is enough to incentivise employers to invest in workplace health and safety, then the possibility of having to shoulder all the costs for workplace injuries under AEP should serve as even bigger incentive for employers to prevent workplace injuries.

therefore these apprehensions remain tenuous. Still, it does not detract from the unsettling similarity that AEP bears with the pre-ACC system of worker compensation, whose very faults and deficiencies the ACC scheme was designed to address.

1.3 Compensation of occupational leptospirosis

As noted above, the ACC scheme makes a distinction between injuries from an accident and injuries from a disease; the former is eligible for cover while the latter is not. The only exception is for occupational diseases. D. Duncan (2019, p. 55) termed this arrangement as an “accident plus exceptions” structure⁴, and this has been in place since the scheme’s inception. The implications for this structure will be discussed in more detail in later sections.

1.3.1 Cover versus Entitlement

Before moving to further discussions of compensation for occupational diseases, it might be prudent to discuss the distinction between cover and entitlements, although both terms have been defined above. Cover and entitlements can be thought of as the two halves that make up a claim. Entitlements are usually what comes to mind when talking about compensation in general, e.g. receiving a reduced salary while off-work from an injury. However, entitlements are actually corollary to cover. Cover is the first hurdle a claim must pass; when a compensation claim is rejected, it is on the basis of cover. It is only after cover is granted that consideration of entitlements occurs.

This delineation between cover decision and entitlement decision serves as the boundary line for the scope of this project. This study will only examine the compensation process up to the point of cover decision. This is because the criteria for deciding cover is universal whereas deciding on which entitlements are appropriate is on a case-by-case basis.

⁴ The reason for the inclusion of occupational diseases was because the pre-ACC worker compensation scheme, under the Worker Compensation Act, already granted compensation for anthrax and certain types of heavy metal poisoning. The 1972 ACC Act upheld the occupational diseases provisions from the Worker Compensation Act but recognised them as “extension of cover” (AC Act 1972 sec 65).

1.3.2 Cover for occupational diseases and the issue of causation

Aside from the distinction between accidents and illness (discussed in sec 1.2.1), another way ACC categorises claims is by separating it into work-related (AC Act 2001 Section 28), non-work related (AC Act 2001 Section 26), and treatment injury-related (AC Act 2001 Section 32). Occupational diseases fall under the broad category of work-related injury claims, but because they are diseases rather than injuries, they belong to another sub category: *Work-related gradual process, disease, or infection* (WRGPDI) or just *Gradual Process* claims (AC Act 2001 Section 30). ACC provides a flowchart for deciding whether a claim falls under the WRGPDI cover (See Figure 1. ACC Gradual Process flowchart).

To receive cover, a Gradual Process claim has to have the following:

- (1) That the injury was caused by a gradual process, disease, or infection (i.e. *a confirmed diagnosis*); and
- (2) That the injury was caused by a work-related causative property or characteristics that satisfy the three-tier test (i.e. *an appropriate work-related exposure*). The three-tier test to ascertain appropriate exposure asks the following:
 - a) Does the causative property exist in the person's employment tasks or work environment?
 - b) Is the same property not found in the person's non-work tasks or environment?
 - c) Is there a significantly greater risk of disease for persons who perform those tasks or works in that environment than for those who don't?

As mentioned above, the abolition of the fault principle⁵ from the ACC scheme meant that causation becomes the sole element for deciding cover (Duffy, 2003; Tennent, 2009). Numerous authors have pointed out how proving causation for occupational diseases can be very challenging (Hook, 2008; Kreber, 2007; Tennent,

⁵ An alternative argument can be made here that the original intention of Woodhouse et al. (1967) for removing the fault principle was to actually put the emphasis of compensation on addressing the consequences of injuries, and not so much on the causes of injuries. However, the implementation of the scheme throughout the years has seen causation become the pre-requisite for compensation.

2012). Going back to the “accident plus exceptions” (D. Duncan, 2019, p. 55) description, it was argued that the accident-focused nature of the scheme has meant that ACC’s policies and procedures are more geared towards compensating for accidental injuries than they are for non-accidental injuries, thus making obtaining cover for the latter harder. Some of the difficulty is because, for the most part, it is easier to establish a causal link between an injury and a traumatic event than it is between an injury and a gradual process (Tennent, 2009). Leigh, 1999 in Lippel (2012, p. 522) observed that “those suffering occupational diseases... will have a more difficult experience with the compensation system than those suffering from traumatic injury”.

Another factor making causation more difficult for occupational diseases is having to prove the work-relatedness of the exposure; in contrast, any injury that has been proven to be caused by an accident would automatically get compensation. Occupational diseases will only be compensated if they pass the work-related causation criteria as laid out in the three-tier test. The three-tier test requires not only that the exposure has to come from work but also that non-work exposures are excluded. Dew (2002, p. 164) observed that it is much easier to attribute symptoms to a non-work reason than it is to attribute it to workplace events.

There have been criticisms that ACC’s interpretation of the causation requirements can be too narrow (D. Duncan, 2019; Hook, 2008). Forster, Barraclough, and Mijatov (2017) commented that “the way ACC applies causation makes injured people feel like the system is unfair” (p.1) and that this has recreated the same problems the ACC scheme was meant to prevent or overcome (p.2).

ACC acknowledges that investigating whether a claim meets the stringent causation criteria can be costly in both time and resources, and that there are some occupational exposures that have a recognised heightened risk for certain diseases or conditions (Driscoll et al., 2005). These “notoriously work-related” disorders are listed in Schedule 2 of the Act (Tennent, 2012, p. 88). Disorders listed in Schedule 2 are accepted as arising from work, and thus no longer need to be subjected to the three-tier test (Kreber, 2007, p. 109). For this reason, it is believed that the cover decision process for diseases in Schedule 2 is more straightforward and streamlined compared

to conditions that are assessed against the three-tier test (Driscoll et al., 2005; Keenan, 2007).

Figure 1 ACC Gradual Process flowchart. From <https://www.acc.co.nz/assets/injured/6e764cb71f/work-gradual-injury-cover-decisions.pdf>. Accessed 1 July 2019

1.3.3 Leptospirosis as a Schedule 2 injury

Occupationally-acquired leptospirosis was added to Schedule 2 by the 2001 Act. It is listed in the Schedule as “Leptospirosis diagnosed as caused by working with animals or their carcasses”.

The definition in Schedule 2 can be broken down into:

- (1) the disorder, i.e. “Leptospirosis”;
- (2) the exposure, which specifies not only that it has to be work acquired, i.e. “working” but also which activity, i.e. “with animals or their carcasses”; and
- (3) the need for a medical diagnosis, i.e. “diagnosed as”.

In other words, in order for a leptospirosis claim to be granted cover under Schedule 2, it must have a medical confirmation of the disorder and an exposure as described in the Schedule.

Once all that is established, there is a presumption of immediate cover [Tennant 2012]. The implication of a claim falling under a Schedule 2 condition is that the only way the insurer can decline cover is if they can prove that (a) the injury is not the kind described under the Schedule, or (b) the cause of the injury was not work-related (AC Act 2001 Section 60). In other words, the legislation is presumptive, and the onus is on the insurer to disprove causation.

Leptospirosis claims that do not meet the conditions of a Schedule 2 injury will need to pass the three-tier test to get cover as a Gradual Process claim. It should be noted that the three-tier test is related to the assessment of the exposure, and not with the medical criteria. Any leptospirosis claim, whether it be a Gradual Process or Schedule 2 claim, must satisfy the diagnosis or case definition for leptospirosis.

1.3.4 Case definitions from MoH and ACC

The Ministry of Health’s (MoH) Communicable Disease Manual [2017] defines *confirmed* and *probable* as:

- Confirmed – a clinically compatible illness with least one of the following definitive laboratory evidences:

- Isolation of leptospire from a clinical specimen.
 - Detection of leptospiral nucleic acid from a clinical specimen.
 - A fourfold or greater rise in leptospiral MAT between acute and convalescent sera.
 - A single raised titre of ≥ 400 on MAT.
- Probable – a clinically compatible illness with a suggestive laboratory evidence of a single raised titre of < 400 on MAT.

A *clinically compatible illness* means that it is an acute illness characterised by fever, chills, headache, myalgia, nausea, diarrhoea, abdominal pain, meningitis, cough and conjunctival suffusion. Severe manifestations may include jaundice, renal failure, haemorrhage, pneumonitis, and haemodynamic collapse (MoH, 2017).

Despite requiring at least only one of the laboratory results, the MoH recommends that both nucleic acid testing and MAT be undertaken to improve diagnostic accuracy. The MoH recommends IgM assays as a screening test but not a confirmatory test because of its potential for cross-reactivity with other diseases. MAT is the current gold standard serological test and MoH recommends paired samples with a minimum of two weeks in between samples (MoH, 2017).

As of 1 April 2019, the ACC case definition for leptospirosis is not currently published anywhere in their website, but a 2014 ACC Review document entitled *Leptospirosis in New Zealand* (see Appendix 2 ACC OIA response) lists the case definition for confirmed and probable cases. The ACC review document states that both confirmed and probable cases may be eligible for compensation.

The ACC case definition resembles that of the MoH, but differs on two accounts, namely,

- the single titre level for a confirmed case for ACC is ≥ 800 on MAT (compared to ≥ 400 for MoH), and
- the titre level for a probable case for ACC is ≥ 200 on MAT (compared to < 400 for MoH).

The inconsistent case definitions are concerning, especially because a medical diagnosis of the condition is a pre-requisite for leptospirosis claims.

1.3.5 Need for medical assessment

A physician's role in worker compensation has been described as that of a gatekeeper (G. Duncan, 2003), with medical practitioners often involved in the areas of access to cover, benefit determination, and the return-to-work process (Lippel, 2012, p. 524). Indeed, ACC requires Gradual Process claims to be lodged by a medical practitioner on behalf of the patient (ACC, 2019c, p. 6), and also seeks medical opinion regarding the appropriateness of cover and entitlements for Gradual Process claims (Tennent, 2012, p. 115).

The effect of medical opinion on the compensation outcomes for certain occupationally-acquired conditions like chemical poisoning (Dew, 2002; Kreber, 2007) and degenerative conditions linked to workplace stress (D. Duncan, 2017; Tennent, 2009) have been examined; unfortunately, no such examination has been done for occupationally-acquired leptospirosis. Still, observations from said studies may be relevant to the issue at hand. Dew (2002, p. 175) notes that when uncertainty about causation exists, medical science can be co-opted by insurers to serve their interests of keeping the cost of insurance down. Kreber (2007, p. 114) also found that disagreements among medical experts regarding causation may result in delays in the decision process.

In the case of leptospirosis, the long history of the condition as an occupational disease means that on the general level, there is a consensus regarding the typical symptoms and causes of the disease. However, on the specific level, some differences still exist; case in point would be the inconsistent titre levels discussed above.

1.3.6 Legislative time frame

The law requires that ACC act on a Gradual Process claim within two months from the lodgement date (AC Act 2001 Section 57). If ACC requires further time for investigation, they can extend up to nine months, provided the claimant agrees to the extension. However, ACC is legally required to decide on a claim within nine months

of the claim being lodged. AEs/TPAs must also adhere to the same time limits for making a decision on a claim.

1.3.7 Leptospirosis claims statistics

ACC provided leptospirosis claims statistics from years 2006/07 to 2017/18⁶ (see Appendix 2 ACC OIA response). A summary is presented in Table 1.

Table 1 Summary of leptospirosis claims statistics from 2006/07 to 2017/18.

	Total claims registered	Total claims accepted	Percent accepted
ACC	346	198	57.2%
AEs/TPAs	218	151	69.3%

The claims data from AEs/TPAs represent claims managed by the AEs as well as those contracted out to TPAs. Although AEs are required to send claim information to ACC on a regular basis, ACC could not guarantee the accuracy of the data provided by the AEs (Appendix 2 ACC OIA response). The higher acceptance percentage from AEs/TPAs is an interesting finding, given the apprehensions earlier stated about AEP.

As mentioned above, leptospirosis was included in Schedule 2 by the 2001 Act. However, the 2001 Act only came into force on the succeeding year, on 1 April 2002 [AC Act 2001 Section 2]. That means that prior to that date, all leptospirosis claims were subjected to the three-tier test. ACC did not provide claims data before 2007, citing incompleteness of the data due to a change in their database system during that year. Luckily, the 2007 DoL report by Keenan included ACC leptospirosis claims records from 1991/92 to 2005/06. A summary of the combined claims data from the 2007 DoL report and the data obtained from ACC is presented in Table 2.

⁶ An ACC financial year is 1 July to 30 June. ACC provided claims data for the last 12 financial years from 2006/07 to 2017/18 only. Data was extracted on 25 March 2019 and may differ if re-run at a later date.

Table 2 Acceptance percentage of leptospirosis claims before and after inclusion into Schedule 2

	Percent Accepted
Prior to inclusion into Schedule 2 (1991/92 to 2001/02)	74.1%
After inclusion into Schedule 2 (2002/03 to 2017/18) *	56.4%

*Combined data from Keenan (2007) (for the years 2002/03 to 2005/06) and from data requested from ACC (for the years 2006/07 to 2017/18)

Table 2 shows that that since leptospirosis' inclusion into Schedule 2, the percentage of accepted claims actually dropped. This reduction in acceptance is puzzling, especially since inclusion into Schedule 2 is believed to produce a more streamlined claim assessment process.

1.4 Chapter Summary

In summary, this chapter shows the following points:

- Leptospirosis is a recognised risk for certain occupations, and the disease causes considerable suffering in some patients.
- Workers in New Zealand who develop leptospirosis during the course of their work are eligible for compensation.
- The requirements of a leptospirosis claim can be complicated and the medical nature of the claim requires assessment from medical professionals before (by treatment providers like general practitioners or hospital doctors) and after lodgement (by medical advisors).
- Much of the key decisions affecting a leptospirosis claim are made by medical professionals outside the claimant's purview; this contributes to the patient's feeling of "powerlessness" and adds to the overall stress caused by the illness.

The goal of this study is to make the compensation process for occupationally-acquired leptospirosis better understood, by first documenting what happens to a claim before and after it is lodged, and second, by finding out how it is assessed for cover.

Chapter 2

Methods, Results, and Discussion

This chapter is split into three sections: the first discusses the study aim and objectives as well as the methods used to answer them, the second contains the results from the inquiry, while the third section discusses the implication of said results.

2.1 Methods

2.1.1 Study genesis and development of the research question

The supervisors for this project are all involved in another larger, on-going study that seeks to investigate the experiences of people with leptospirosis, with compensation making up a part of that experience (Benschop, n.d.). That larger study looks at compensation from the view point of the patient; however, while the patient perspective offers valuable insight about the consequences of the process, it is less able to provide insight on the internal factors that drive the process since many of the crucial decisions affecting the claim are made by treatment providers and insurance claim assessors largely outside of the patient's purview. Moreover, some of the issues with compensation raised in that study stem from the decisions made by these key persons. That study brought up questions of how a leptospirosis claim is assessed and why it is assessed in that way.

This project was therefore conceived as a way to round out the understanding of the whole compensation system for leptospirosis, focusing on the steps of claim initiation and cover assessment. This study seeks to achieve that aim by first establishing what are the bases of a claim, and second, investigating how treatment providers and medical advisors assess a case or claim. The research objectives are the following:

- Clarify what are the requirements for a claim.
- Find out what happens to a claim after its lodgement and up to when cover decision is made.
- Discover factors that influences the assessment of a case or claim.

This study focuses on the treatment providers and medical advisors, for two reasons: (1) the patient perspective is already being investigated by that larger ongoing study, and (2) speaking with patients would necessitate a full ethics application, which is not feasible within the one-semester project time frame.

Refinement of the research question was greatly helped by discussions with a project consultant. The consultant is an experienced occupational health physician as well as an ACC health advisor. The consultant does not personally handle leptospirosis

claims for ACC but is familiar with ACC procedures and policies. The discussions with the consultant helped define the project scope and frame the interview questions.

2.1.2 Study design.

The study goal informed the choice of a qualitative mode of inquiry. As (Maykut & Morehouse, 1994, p. 16) state, “qualitative research places emphasis on understanding through looking closely at people’s words, actions and records”. In this study, the qualitative approach was used to find out how the key actors make the decisions they make, enabling discovery and exploration of the factors affecting the process.

The study design is that of a *qualitative descriptive study* described by (Sandelowski, 2000, 2010). A qualitative descriptive study is a distinct method from other types of qualitative study (e.g. phenomenology, ethnography, grounded theory) which require interpretation of findings through a specific paradigm. In qualitative description, the emphasis is on obtaining a comprehensive description of the phenomenon or topic under study, using the everyday language of the phenomenon (Sandelowski, 2000, p. 336). It is said to possess a *factist* position on data, i.e. it assumes that the accounts from the participants are truthful and is more or less an accurate portrayal of reality (Sandelowski, 2010, p. 80). Seixas, Smith, and Mitton (2018, p. 779) likened the researcher role in such a study as that of a “composite sketch artist”, whose goal is to depict the reality witnessed by a person, using reports from the person.

Both Milne and Oberle (2005) and Neergaard, Olesen, Andersen, and Sondergaard (2009) note that although qualitative description tends to stick close to the surface of the data, it does not mean that no interpretation occurs. Sandelowski (2000, p. 335) posits that the researcher, in selecting what to describe will, “in the process of featuring certain aspects of it, begin to transform the experience or event”.

The results of a qualitative descriptive study may be low-level inference but having an accurate summary of events or phenomenon can help generate hypotheses or working concepts for future investigations. It is hoped that obtaining an accurate

description of the case or claim assessment process of these key actors will shed light on where the inconsistencies are and where areas for improvement can be made.

2.1.3 Data collection

This study made use of data coming from publicly available documents and information requested from ACC as well as data from the results of the interviews. The data from the documents were used to determine the formal procedure and requirements of the process (see Section 3 in Chapter 1) and to establish the context for interpreting the interview results, which were used to discover and reconstruct how the actual process plays out in real life.

The publicly available documents were all obtained online, from organisation websites or online archives. These were divided into documents that were about compensation in general (e.g. various legislations and ACC reports and publications), documents pertaining to leptospirosis as a disease (e.g. MoH guidelines), and documents pertaining to leptospirosis as an occupational hazard (e.g. WorkSafe guidelines and the 2007 DoL report). Information regarding leptospirosis claims and procedures was also requested from ACC via an Official Information Act request (see Appendix 2 ACC OIA Response).

A semi-structured interview method was utilised in this study. This method was chosen because it provided a guide to the interviewer but also allowed the interviewer to seek clarification and probe beyond the initial answers. This is especially important as one of the objectives of the study was to discover how decisions are made. May (2011) writes that this method allows greater latitude to the interviewee to answer on their own terms while still providing the interviewer with a structure to follow. The flexibility of a semi-structured interview allows the interviewer to cover the same topics in each interview but also makes room for participants to add topics that they feel might be relevant into the discussion (Corbin & Strauss, 2015).

The interview questions were developed with the supervisors and the consultant. One set was developed for the treatment providers (Appendix 3) and another for the medical advisors (Appendix 4).

2.1.4 Ethical considerations

The ethical considerations were assessed using Massey University's Risk Assessment checklist and was discussed with all the supervisors. A low-risk ethics application was deemed appropriate for the type of participants and for the project time frame. The low-risk ethics notification was obtained on 11 Feb 2019 (See Appendix 1 Low Risk Ethics Notification Letter).

Confidentiality and informed consent were key concerns in the discussions about ethical considerations. Strategies to address confidentiality included using codes for the transcript and setting limits to who will have access to the transcripts. Informed consent was achieved by making it clear to the participants what the aim of the project was and how the data will be managed. A participant information sheet and consent form (Appendix 5) were sent with every invitation, and the researcher made sure to double check at the start of the interview if the participants had any questions about the research purpose. Their respective interview transcripts were also sent to each participant, to give them the chance to review and make amendments to the transcript.

2.1.5 Sampling strategy

The study goals informed the sampling strategy and sample size. Purposive sampling was used to recruit participants. It is a technique wherein participants are deliberately selected on the basis of their knowledge and its relevance to the topic being investigated (Denscombe, 2014). Participant selection is based on the researchers' judgement on which potential participants will produce the most valuable data. For this reason, participants were also referred to as *key informants* and were recruited precisely because of their experience and knowledge.

Treatment providers who can serve as potential key informants were first identified by supervisors, drawing upon their contacts and connections established in other projects, and then referred to the researcher. The profile of treatment providers selected for this study was that of clinicians who commonly encounter leptospirosis and therefore more familiar with the disease and its impact on workers than the overall population of physicians.

The sample pool for medical advisors was similarly populated by referrals from the supervisors and from the consultant, who is himself a medical advisor. Referrals were also sought from the participants.

Concern about project size in relation to the time frame and resources also factored into the sample size consideration. A target size of 3-4 key informants for each group was deemed appropriate, with the first group composed of treatment providers and the second of medical advisors. However, obtaining the targeted number was a secondary concern; the main consideration was to obtain participants that will provide *quality* insight. The emphasis in purposive sampling is to select “information-rich” cases (Patton, 2015 in Liamputtong, 2019).

2.1.6 Recruitment of treatment providers

Four treatment providers were referred to the researcher. They were approached through email and invited into the study. All agreed to be interviewed.

Three were primary care or community care physicians (“TP 1”, “TP 2”, “TP 3”) while one was a secondary care or hospital-based physician (“TP 4”). The initial intention was for the treatment providers to be represented wholly by primary care physicians. However, a meeting with the consultant led to the realisation that a portion of claims come from hospitals, and therefore the perspective from a hospital-based physician would give a more complete view of the situation.

Experience of the physicians ranged from 20 to 35 years in practice. All work in areas where the meat processing industry makes up a significant portion of the industrialised sector. TP 1 and 2 also work as company doctors for meat plants while TP 3’s practice is in an area with three neighbouring meat plants and therefore sees plenty of meat workers, along with dairy and beef farmers. TP 4 is located in a region that had some of the highest number of leptospirosis cases in the country between 2010-15 (El-Tras et al., 2018).

A particular feature in the secondary-care setting is that clinical and administrative duties are more distinctly delineated than in a primary-care setting and this meant that TP 4 could not answer some of the more procedural questions about compensation. The researcher was instead referred to the hospital’s ACC liaison

officer for those administrative-related questions. The answers from the liaison officer were used to supplement the interview results from TP 4.

2.1.7 Recruitment of medical advisors

Five medical advisors, three from ACC and two from TPAs, were contacted via email and sent invitations. One advisor from ACC declined on the grounds that they did not have experience with regards to leptospirosis claims, while two (one from ACC and the other affiliated with a TPA) did not reply to both initial and follow-up invitations. Of the two medical advisers who agreed to participate, one works as a consultant for a TPA (“MA 1”) while the other works for ACC (“MA 2”). Both are occupational medicine physicians and have worked as medical advisors for many years.

The ‘quality’ of the participants in this group made up for the lack of quantity, e.g. MA 2 serves as the lead advisor for Schedule 2 claims for ACC and the procedural practices of ACC meant that leptospirosis claims would almost always be referred to MA 2. In terms of advisor experience with leptospirosis claims for ACC, MA 2 is on the top of the list. Failure to obtain another TPA-affiliated advisor was also not a cause for concern since the study does not seek to compare TPA practices, and the interview from MA 1 indicates that the advisor is separate from the procedures of a TPA.

The interview with MA 2 lead to an opportunity to interview the Team Manager (“TM”) for the Gradual Process Team of ACC. The Gradual Process Team are the case coordinators handing all Gradual Process claims, including Schedule 2 claims, for ACC. The role of case coordinators will be discussed in more detail in the Results section. Case coordinators were initially not included as potential key informants, mainly because their role was thought to be purely administrative. However, the interview with MA 2 revealed how closely the two roles were intertwined and it was decided that an interview with a case coordinator would lend more accuracy to understanding the process.

2.1.8 Preparation and conduct of interviews

One interview per participant was conducted. Consent to be audio-recorded was obtained prior to the interview session and confirmed again at the start of the interview. The student researcher conducted all but one of the interviews (TP 1), which was done by the supervisor. Both interviewers used the same question set.

An in-person interview, at a time and place of their choosing, was the first option offered to the key informants. In-person was preferred because the naturalness in a face-to-face setting was said to stimulate more thoughtful and accurate responses (Shuy, 2011). However, it was also foreseen in the interview preparation stage that some of the informants may choose to be interviewed via phone or video call. Groves, 1978 in Shuy (2011) found that telephone interviews tended to have a faster pace and that this inspired less introspection, while Aquilino, 1994 in Shuy (2011) concluded that it was harder to gain the respondents' trust in phone interviews. Shuy (2011) added that the absence of visual cues in a telephone interview may lead to shorter and less thoughtful responses.

The following strategies were therefore employed to reduce the disadvantages of a telephone interview: (1) carefully crafting the interview questions in order to increase the chances of eliciting more open responses, and (2) using follow-up or probing questions to encourage participants to elaborate, clarify or amend their responses. The researcher also attended a workshop in order to practice and improve their interviewing skills and paid particular attention to rapport building during the conduct of the interviews.

The table below lists the media and length of the interviews, in the order of the interview dates.

Table 3 Dates, duration, and medium of the interview with the key informants

Interviewee	Medium	Interview Date	Duration
TP 4	Phone	27 Mar 2019	17:25
MA 1	Phone	28 Mar 2019	20:30
MA 2	In-person	2 Apr 2019	34:27
TP 1	In-person	2 Apr 2019	16:05
TP 2	In-person	4 Apr 2019	33:06
TP 3	Video call	17 Apr 2019	30:26
TM	Phone	24 Apr 2019	26:33

The interviews began with a general question asking the participants to relate their role in occupational leptospirosis. This was not a specific question in the questionnaire but was used to establish rapport and also allowed the participants time and opportunity to get into the headspace of the interview topic. Rapport building was especially important as the interview session was, in most instances, the first verbal dialogue between the researcher and the key informant; communications prior to the interview were in the form of email or text messages.

The interview followed the structure in the question sets, although in some instances, questions were paraphrased or went unprompted because the answers from the informants naturally flowed into the next question. The interviewer let the participant dictate the flow and pace of the conversation and built on the informant's answers to pose follow up questions.

2.1.9 Interview transcription

All interviews were transcribed by the researcher. A selective transcript was made. Denscombe (2014) writes that a selective transcript is appropriate if the aim is to acquire factual information from the interview contents.

The initial transcription was sent to all the key informants, for them to add or delete information as well as confirm the written account of their answers. Whatever revisions they made were automatically accepted, and only the revised transcript was used in the study. This step not only gave greater autonomy and control to the participants, but also ensured the accuracy of the transcript.

Milne and Oberle (2005) note that an accurate transcription is necessary for ensuring authenticity, which is a key element in upholding the rigor of a study. Authenticity means making sure the participants had the freedom to speak, have their voices heard, and their perspectives accurately represented (Milne & Oberle, 2005, p. 415)

2.1.10 Data analysis

The analysis of the data was guided by the thematic analysis method described by Braun, Clarke, Hayfield, and Terry (2019).

The first phase of the analysis started with familiarisation with the data. In this study, the process of transcribing the interviews jumpstarted familiarisation. Braun et al. (2019, p. 853) note that familiarisation provides a crucial entry point into the data, allowing the researcher opportunity to closely read and thoroughly engage with data and make sense of ideas in the data that are new to them. The interview transcripts were read and reread, noting down which segments in the data were responsive to the research question, as well as the unexpected features in the data, and noticing patterns across the data. These observations contributed to the next phase of the analysis, which was the generation of codes.

The coding phase was a more thorough and systematic way of engaging with the data; it entailed meticulous reading of the data and assigning codes for the noticed features. The codes functioned as labels or descriptions for broad concepts in the data and served as the individual unit of analysis. Braun et al. (2019) differentiated between *semantic* (i.e. description captures the surface-level or manifest meaning) and *latent* codes. (i.e. description captures the implied or implicit meaning). Vaismoradi, Turunen, and Bondas (2013, p. 403) notes that thematic analysis incorporates both manifest and latent aspects. This study was concerned with manifest meaning. Examples of initial codes for this study include doctor recognition, patient compliance, cover denial because of titres, consistency of symptoms with exposure, etc.

Initially, the codes were generated inductively. However, as the coding phase progressed, and as the researcher sought to apply the same codes or labels for similar concepts, the coding shifted to a more deductive manner. Merriam and Tisdell (2016, p. 202) notes that data analysis is a recursive process that involves moving back and

forth “between inductive and deductive reasoning, between description and interpretation”.

The next phase of the analysis was the construction of themes. It referred to the process of grouping the coded material based on shared concepts. Braun et al. (2019) differentiated between themes that are *domain summaries* (i.e. themes that are a summary of what participants said about a topic) and *shared meaning-based pattern*. (i.e. themes that capture an important element in the data and represent a patterned response or meaning (Braun & Clarke, 2006, p. 82)).

Because this study undertook a semantic approach, the analytic process involved a progression from description to interpretation (Braun & Clarke, 2006). The description part of the analytic process was represented by the initial themes, which were mostly domain summaries that followed the narrative progression of the claims process, i.e. from treatment provider and onto claim assessors. However, as the themes were reviewed and re-defined in the next two phases of the analysis, interpretation of the data occurred in the form of theorising the “significance of the patterns and their broader meanings and implications” (Patton, 1990 in Braun & Clarke, 2006, p. 84). This meant that the initial themes were re-examined in relation to one another and in relation to the research question, and what was produced from this process of interpretation were themes based on shared meanings.

The last step of the analysis method was that of writing up the report, and this meant another round of examining the themes while at the same time connecting to existing literature.

With regards to literature, unlike other thematic analysis studies who chose to delay the literature review until after the analysis in order to reduce the impact of researcher preconceptions (Anderson & Clarke, 2017), this study engaged with literature during the conduct of the interviews, as well as in the initial stages of data analysis. Braun and Clarke (2006, p. 86) pointed out that engaging with literature before analysis may sensitise the researcher to subtle features of the data, although it may also narrow the field of vision at the expense of potentially crucial aspects. In this case, the unfamiliarity of the researcher to the topic beforehand, as well as concerns about the project time frame, meant that literature engagement before analysis was chosen.

2.1.11 Methods reflections

The choices detailed above were selected as the best possible fit for the study objectives, time frame and resources, as well as for the novice status of the researcher. That said, this section discusses the possible weaknesses of the chosen methods as well as the strategies employed to offset the shortcomings.

The small sample size increased the risk of anecdotalism, wherein one or few idiosyncratic instances of a phenomenon is mistakenly reified into a pattern or theme (Braun & Clarke, 2006, p. 95). One way to mitigate the risk for anecdotalism was by corroborating observations among the participants, but this was not always possible; it should also be noted that prevalence does not always equate to importance. For Braun and Clarke (2006), the way to avoid anecdotalism was for the researcher to practice criticality. Milne and Oberle (2005, p. 414) described criticality as taking a critical approach and being deliberate about every decision made in a study.

Criticality not only addressed anecdotalism, it also helped avoid the problem of underdeveloped themes. Connelly and Peltzer (2016) defined underdeveloped themes as those that failed to convey anything of significance, and attributes insufficient interview preparation and lack of criticality during analysis as factors that lead to underdeveloped themes. Strategies used to prevent underdeveloped themes included avoiding one-word themes (Braun et al., 2019) paying attention to coherence and choosing compelling examples (Braun & Clarke, 2006), and explaining the rationale that underlies a theme (Connelly & Peltzer, 2016).

The use of documents also helped support the observation from the interviews, but their use also came with some considerations. The documents used in the study were government publications and reports, but Milne and Oberle (2005) note that this does not always mean that they are objective and accurate. Another consideration is that the documents were not produced for research purposes, and the original intention, including inherent biases, may remain embedded in the information. Criticality was once again the answer to these potential pitfalls. Criticality of the document meant actively engaging with the data and being cognizant of the contextual factors that come with the information (McLennan & Prinsen, 2014).

Active engagement required both criticality and reflexivity; reflexivity meant acknowledging one's own "biases, dispositions, and assumptions" regarding the research (Merriam & Tisdell, 2016, p. 249). For this study, the researcher's status as an outsider to the whole system of compensation in New Zealand meant there was probably less initial bias in approaching the topic, but it also meant that the researcher relied heavily on the information provided by the participants and from documents and literature. It could be said that the knowledge imbalance between the interviewer and participant was in the favor of the latter, and this meant again that criticality had to be a conscious, ongoing effort by the researcher.

2.2 Results

The following section contains the results from the document analysis and interviews. It is split into three parts. The first recreates the whole process and identifies the key actors involved in each step and the decision-making criteria they employ. The second and third parts summarise the key findings from the interviews with the treatment providers and the claim assessors, respectively.

2.2.1 Leptospirosis claims process – from claim initiation to cover decision

The steps in the compensation process, as determined from the document analysis and interview results, are shown in Figure 2. The diagram starts with the patient deciding to see a treatment provider and ends when cover is decided. The diagram also includes the major decision each key actor needs to make, as well as examples of the questions that go into their decision-making.

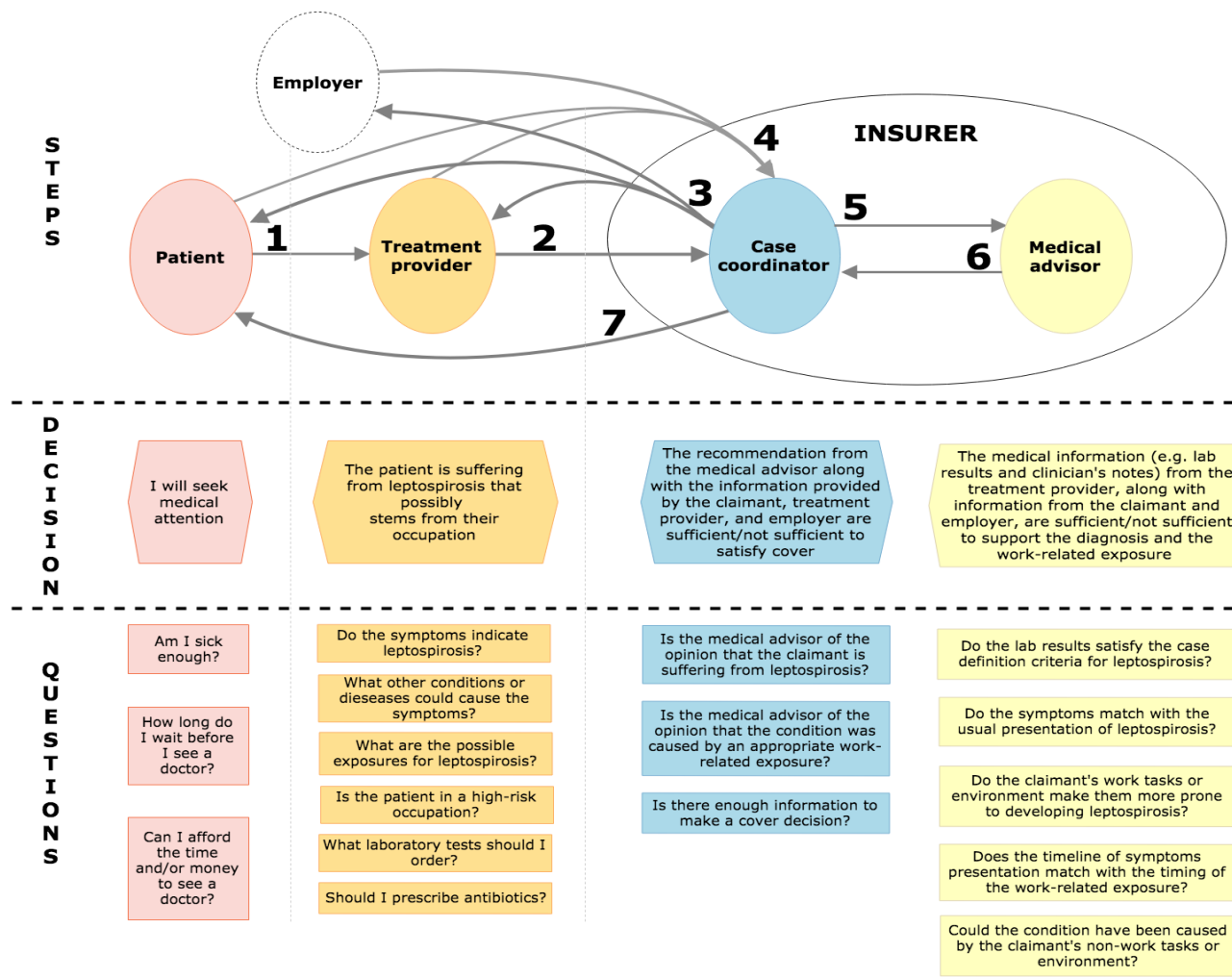


Figure 2 Process map and decision criteria of the ACC leptospirosis claims process, starting from when the patient decides to visit a treatment provider and up to when cover is decided

The explanations for the steps are found below:

- Patient decides to see a treatment provider (**Arrow 1**). This is the first step and thus an integral part of the process and was therefore included in the diagram; however, this step is outside the scope of this project. The factors that drive or deter patients to seek medical attention may be investigated in future studies.
- When the treatment provider sees the patient, they must make the following critical action points:
 - Suspect leptospirosis, basing their suspicion on the patient's symptoms and exposure history.
 - Come up with a treatment plan.
 - Decide which laboratory tests are appropriate to help them confirm diagnosis.
 - Recognise the occupational link of the condition and initiate a claim.

The last action point is the next step in the compensation process. The treatment provider lodges a leptospirosis claim on behalf of the patient, using an ACC 45 Injury Claim form (**Arrow 2**).

- Because of leptospirosis' inclusion into the Schedule 2 list of occupational diseases, the administrative process for dealing with those claims is streamlined. That means ACC has a set procedure for dealing with leptospirosis claims; when a leptospirosis claim is registered in the ACC system, it is automatically assigned to the Gradual Process Team and assigned a case coordinator. The case coordinator's first task will be to obtain further information about the exposure (information mostly comes from the patient and the employer, although the latter is not applicable for self-employed individuals) and the condition (from the treatment provider/s⁷, e.g.

⁷ For patients or claimants who see more than one treatment provider, the case coordinator will request information from all the treatment providers.

patient notes and laboratory results) (**Arrows 3**). This is a very important step because insufficient information can cause a denial of cover.

- The patient, treatment provider/s, and employer (if applicable) will send the requested information back to the case coordinator (**Arrows 4**).
- Once the case-coordinator has obtained the necessary information, they send the claim to the medical advisor for comment (**Arrow 5**). If the case coordinator has a specific question about the claim, e.g. if the timeline of symptoms matches with the exposure timing, they will ask the medical advisor to for comment. The medical advisor will use the information coming from the treatment provider to check the diagnosis and the information from the patient and the employer to assess the appropriateness of the exposure.

Note: The procedural tasks of the case coordinator discussed above pertain more to ACC; an AE/TPA might have similar practices but the specifics may vary for each AE/TPA. One difference could be that, for AE/TPA, the medical advisor might be distinctly separate from the case coordinator; external medical advisors may just be consulted by an AE/TPA on a case-to-case basis. Whereas in ACC, consulting with a medical advisor is a procedural requirement and medical advisors are part of the internal organisational structure. Still, it can be assumed that the general steps of gathering and assessing information are applicable to all.

- The medical advisor then sends back their recommendation on whether the information supports the diagnosis and the work-related exposure (**Arrow 6**). It must be stressed here that the cover decision is the job of the case coordinator; however, the medical nature of leptospirosis claims means that it is ACC's policy that the cover decision is made using the recommendation from the medical advisor. This distinction may seem arbitrary to persons outside the organisation, but it is an important distinction enforced by ACC policy. The medical advice usually comes in the form of “based on the available information, we can/cannot say that ‘x’ caused ‘y’, and therefore cover is/not appropriate”.

- The case coordinator uses the recommendation from the medical advisor to decide on cover (**Arrow 7**). If cover is awarded, the claim is then sent to a case manager for determining entitlements (not pictured in the diagram as this is outside the scope of this project). If it is decided that the injury is not covered (i.e. claim is rejected), the case coordinator will inform the patient or claimant about the decision and the reason for the rejection. The claimant may appeal the decision through the appeal process set out in the Act [ACA 2001 section 151].

2.2.2 Interview findings – Treatment providers

The medical providers were interviewed about how they arrive at the initial diagnosis of leptospirosis, what steps they take to confirm diagnosis, and their experience with regards to initiating a claim and coordinating with the insurance provider about the claim. At the end of the interview, they were given the opportunity to relay their overall experience or observations on the issue of compensation of occupationally acquired leptospirosis. The results are as follows:

Initial diagnosis and confirmation of leptospirosis

All of the TPs noted that the clinical manifestations as well as the patient's occupation or a history of animal exposure informed their initial assessment of leptospirosis.

“...Flu-like illness without the flu; headaches, muscle aches, feeling horrible, in the absence of a runny nose and sneezing or cough.”

“Occupation of the patients or their exposure to animals...particularly raises the questions, and that's always the starting point to our deliberation.”

They would then order laboratory test to confirm diagnosis. Their choice of laboratory tests is influenced by how they will utilise the results. For TP 4, the hospital setting meant encountering patients that require more intensive care, and they need the confirmation as soon as possible to guide their choice of therapeutic

management. Therefore, TP 4 relies more on PCR because the results would be available much more quickly than MAT.

“Almost always, a PCR test is performed...usually a blood sample or sometimes a urine sample...We’d get the answer usually within 24 hours... We don’t always do MAT testing because...there is no point in results in 3 weeks’ time because by then the patient is not in our care at all, the patient is back home.”

For the primary care physicians, for whom urgency may not be as high as that in the hospital setting, they recognise the necessity of having MAT results to satisfy the insurance criteria. All of the TPs were familiar with the paired serum sampling for MAT and the four-fold increase in titres. TP 1 and 3 were both familiar with the 1:800 single MAT titre threshold stated in the ACC 2014 document, with TP 1 noting that ACC used to accept 1:400 and that, in his opinion, it should still be accepted at that level now.

“Because what person in the community, fit and well, will have a titre of 1 in 400?”

TP 3 noted that some of his patients do not come back for a second sample, but this was contrary to TP 2’s experience, especially with the workers in the meat plant.

“This happens not infrequently because with leptospirosis, some people... get better and they can’t be bothered going back.” – TP 3

“It’s framed as ‘you need it [second sample] to get your compensation because otherwise you’d be on breadline money instead of 80% of a decent wage’ so I’ve never had a problem.” – TP 2

In addition to MAT, TP 3 also orders a serum or urine PCR. TP 2 remarked that he had no leptospirosis cases since urine PCR became widely available, but if a case would turn up now, he would order a urine PCR to try and get answers within a day or two. TP 1 did not mention PCR testing.

Experience with compensation procedures

As mentioned in the methods sections, the questions about procedures related to compensation were answered by TP 4's hospital's liaison officer. The liaison officer initiates a claim electronically as soon as leptospirosis is suspected. ACC would then hold the claim and wait for the blood results and will accept the claim if the results are positive or decline if negative. The liaison officer follows the same procedure for AEs/TPAs and notes that ACC will be the one to send the claim off to the respective AE/TPA, as the hospital does not directly submit to private insurers.

For the primary care TPs, they are the ones who initiate the claim, by filling out an ACC 45 Form. TP 1 has dealt with both ACC and AE/TPA. TP 2 has only dealt with a TPA, while TP 3 has only dealt with ACC. Both TP 1 and 2 are generally satisfied with their transactions with the AE/TPA. TP 1 mentioned that he had a good relationship with the TPA for the meat plant, and that they tend to trust his diagnosis.

“We had a very good relationship. In fact, they used to send them for assessments in the early days but after a while, they found it was a waste of money. So we had this very unusual relationship wherein if I said it was lepto, they'd probably accept it.”

All mentioned that for 'typical' cases, meaning those where the clinical picture is backed by MAT serological titres that satisfy the threshold levels, the compensation process is straightforward.

“It's fairly clear cut if you have a rising or falling titre...that's in black and white. The only issue came is if you had a case that didn't get a high enough titre.” – TP 1

“When it works well, it's fine.” – TP 3

However, all have encountered patients where titres were not high enough to satisfy the case definition, despite the patient presenting with the usual symptoms. They noted how this could affect the patient.

“...If it’s not accepted by ACC, the employer might turn it down as well⁸. It’ll go down as sickness leave.” – TP 1

“A lot of people who are worried about leptospirosis and it turned out it wasn’t, it does a big hit for them, because they won’t get compensation while they’re off-work.” – TP 2

TP 3 has also experienced ACC denying cover because ACC believes the serovar is inconsistent with the patient’s occupation.

“If it’s a serovar that would generally fit pigs and [the patient] ends up getting a serovar that you’re more likely to get from cattle, then they [ACC] would say that it’s not their occupation that caused that.”

Both TP 1 and 3 have relayed instances where they had to contact ACC to ask about the cover decision.

“I rang up ACC...and I said, ‘Could you please explain to me, with a titre of 1 in 800, how that person could possibly not have had lepto? It’s scientifically impossible.’” – TP 1

“I’ve written to say ‘C’mon, what’s going on here, they’ve obviously got leptospirosis.’ ...They will write back to explain why.” – TP 3

Overall observations or issues they raised about compensation of occupationally acquired leptospirosis

TP 3 has observed that the long waiting time for the paired MAT results causes considerable delays, although this may be partly due to the procedures of the particular laboratory that tests his samples.

“Our laboratory won’t do an initial leptospirosis serology test. They will only do them once they get their second test [sample] 10 to 14 days later...They’ll only test them if they’re paired. Now that might

⁸ The first week off-work is paid by the employer; ACC pays for succeeding weeks. Therefore, if ACC denies a claim, this may also lead to the employer not paying for the first week of illness or the days off-work being deducted from the employee’s sickness leave.

not be the case around the country but that's certainly the case in our area. So you are not going to get an answer from your serology for a minimum of ten days to two weeks.”

For this reason, TP 3 prefers PCR because the results come back within a few days. However, TP 3 has encountered instances where ACC will not accept a positive PCR as proof of recent infection.

“I've tried it...I've put in a claim with only the PCR and they've said, 'We won't accept it, we want to see the serology'... I've deliberately tried to lodge some claims, over the last 12 to 18 months, when I've only got PCR results back and before I've got the serology, and they just won't register it.”

TP 3 expressed frustration with ACC's insistence on MAT results, which can take weeks, when positive PCR results are already available.

“There is no point initiating a claim to ACC until you get your second lot of serology done, which is a minimum of 10 days after the first...So basically the patient and the doctor are left not knowing, for up to 3 weeks, whether or not their claim has even got a chance of being accepted.”

“Keep in mind we're only doing PCRs when we've got a high clinical suspicion, we're not doing them on people willy-nilly. They've got the right occupation, they've got the right clinical picture, you do PCR and its positive – it all fits.”

In TP 3's experience, a “significant number” of patients don't receive compensation either because their titres don't reach the threshold level, or because they recover quickly and don't pursue further testing. TP 1 has also seen cases where patients recover and get back to work quickly therefore not getting compensation is seen as “not a big deal”.

All primary-care TPs mentioned cases of patients with long term symptoms and acknowledged the difficulty in attributing the ongoing symptoms to leptospirosis.

“...the muscle aches and headaches...doesn’t disappear as soon as you have the antibiotics, it can be several weeks or months afterwards...The duration of the illness is variable. Generally, the more severe the illness, the longer it goes on for.” – TP 2

“It’s not that cover is denied at the beginning, it’s more like ACC starts asking questions if their symptoms at the later time is still caused by leptospirosis. And that’s a hard one to answer. It can be difficult with leptospirosis because there’s really no test you can do to prove it...If they’ve got chronic fatigue syndrome and they feel tired and they can’t work, and they can only do half a day and they feel exhausted...that can be a hard thing to prove it is still leptospirosis that’s causing the symptoms. But that’s a minority of patients.” – TP

3

All TPs would administer antibiotics once they suspect leptospirosis, despite also acknowledging that early antibiotic administration might affect the serology results.

“My primary role as a practitioner is to keep people well, so the insurance policeman is secondary to that really. So if I have to treat someone to make them well and get a negative result, then that’s what I’ve got to do, rather than let them suffer for 4 weeks and then treat them.” – TP 2

“One argument is that by starting the antibiotics early – if we have a suspicion of leptospirosis, we’ll usually start antibiotics – we actually reduce the body’s immune response, and so you don’t get the same level of antibody production and that might interfere [with serology].”
– TP 3

2.2.3 Interview findings – Claims assessors (Insurance medical advisors and the Team Manager of ACC’s Gradual Process case coordinators)

The claims assessors were interviewed about how they assess a claim and the factors that influence their advice or decision regarding cover. At the end of the interview, they were given the opportunity to relay their overall experience or observations

regarding compensation of occupationally acquired leptospirosis. The results are as follows:

How they assess a claim for cover

Cover is granted if the case definition for leptospirosis is satisfied and the exposure is determined as work-related. An insufficient proof of illness and insufficient proof that the exposure caused the condition could result in denial of cover.

“The one that would be declined might be that there is no confirmation of the case (i.e. testing), or their symptoms don’t fit with the illness, or they haven’t had an appropriate exposure that would put them at risk.” – MA 1

“Clearly if a diagnosis is not confirmed, we would say, ‘You had some form of febrile unpleasant illness but we don’t think it was leptospirosis...Second would be... work exposure not established or not plausible or non-work sources more likely. But it’s usually those diagnosed as not confirmed. And most GPs won’t bother putting in someone who’s not exposed at work.” – MA 2

MA 1 confirms the diagnosis using the case definition from the Ministry of Health, and checks if the symptoms line up with those described in government documents (e.g. MoH guidelines) and literature.

MA 2 informed that the case definition in the 2014 ACC review document is outdated, and that ACC now accepts the 1 in 400 titre for the single sample MAT, the same threshold used by the Ministry of Health. The discrepancy with the titres for a plausible case (≥ 200 for ACC versus < 400 for MoH) was not discussed.

MA 2 also mentioned how they use results from PCR and IgM-ELISA.

“PCR is fine and wonderful as a screening test – that’s used in the first 7 or 8 days – but we get MAT testing done as well. And the reason for that is we had an episode in Waikato hospital in early 2017/18 where they were making mistakes. Two in a row, with absolutely flat MAT

testing – no rise at all – and positive PCRs. The second one they realised they made a mistake. So we get MAT testing when we can...Even when the PCRs come back, we say, ‘If you think it’s leptospirosis, do MAT testing as well’.”

“We had one quite recently where the MATs weren’t done, and the PCR was not done until day 12 and so it was negative. ELISA was done on day 5, it was negative, and by day 8 it was positive, so there was seroconversion. MATs weren’t done. I said okay, on the basis that there was conversion.”

The appropriateness of the exposure is also something they consider (i.e. the patient’s work tasks or environment) as well as the consistency of the symptoms time line with the exposure (i.e. if there is a reasonable incubation period).

“With leptospirosis, it could be how quickly do you show symptoms. Like if someone is saying their exposure was 3 or 4 months ago, then we’ll try to look at it and say, ‘Is the exposure they are talking about, that is 3 or 4 months ago, actually consistent with causing leptospirosis?’ Whether that time frame is unusual.” – TM

“If you were a freezing worker and you haven’t been there for months and you got leptospirosis, then it might be something else.” – MA 2

In terms of exposure being work-related, the assessors tend to take the patient’s word.

“As far as work-relatedness goes, the person normally tells the truth...and we take that at face value. Unless the employer comes back and says ‘Yes, they did that, but they haven’t worked in the last year.’ So we have to investigate that. But normally, we get the information about work from the patient.” – MA 2

MA 2 also mentioned the three-part test for claims that don’t fall under the Schedule 2 injury description.

“Supposing somebody gets leptospirosis from contaminated water - they go to Fiji, they’re doing hurricane relief and they get it from the flood waters there. Now, they’ve got leptospirosis and because they are basically residents in New Zealand, they’re going over to basically do a job, they’re covered but they’re not covered by Schedule 2 because they’re not working with animals or their carcasses. There’s another test called the three-part test which you would look at there: first, is there a property in the work or in the work environment that can cause leptospirosis - yes, there’s bugs in the water. [Second] Are they exposed to the same bugs away from work - the answer’s no. The third one is: do people who do these type of thing - flood relief in the islands - is the risk of them getting it significantly greater than for people who don’t do that job - and the answer is yes. And so they get cover by a different route.”

MA 2 noted that they no longer look at host-serovar association.

“We take the view that everything can harbour them.”

Overall observations about compensation of occupationally acquired leptospirosis

MA 2 remarked that majority of cases are straightforward; on the other hand, MA 1 notes that cases with insufficient testing is “not uncommon.” The MAs would base their recommendation on the information provided to them.

“You use common sense, you look at it all over... to make a clinical decision... on the balance, was this it?” – MA 2

MA 2 notes that the legislation is presumptive.

“...unless there is a reason not to accept this [the claim], you have to accept.”

The non-specific symptoms of leptospirosis mean that a laboratory result is essential to confirm diagnosis.

“The trouble with the condition is that often the symptoms are what we call non-specific...like a cold, or a flu, or some type of tummy bug...those things can mimic or present in a similar manner...We are reliant a lot on the testing that’s done, and the testing needs to happen quite rapidly.” – MA 1

Both MAs acknowledged that MAT testing can be a bit inconvenient, especially in rural areas

“In the rural areas, it’s harder because they don’t do MAT except in bigger hospitals, and sometimes, they forget... It’s quite common for the first MAT to be normal or slightly raised, and they don’t come back for the second one, and the claim comes in three months later. I say still go out and do it because it should still rise, and it usually is. It’s not always anyone’s fault, it just happens that way, particularly in remote areas.” – MA 2

Both advisors also acknowledge that the level of experience of the physician can influence if MAT will be ordered.

“The issue with some general practitioners who don’t see it often may be that [they] would not necessarily be aware of it. Although my understanding is there’s been a lot of promotion, in terms of risks and what to look for, particularly for at-risk occupations in the rural setting.” – MA 1

“An experienced physician, you could recognise it even though there’s a wide spectrum.” – MA 2

Sometimes patients elect not to provide further information because they no longer want to pursue the claim. There have also been instances where the employers contest liability.

“...if some people are not significantly off-work...and the medical treatment is covered anyway...So unless they want to have an

entitlement – which would be paid time-off in lieu of working – they don't bother.” – MA 2

“And the other thing is they don't want to upset the employer. Because some employers really fight...they just don't want to get in trouble, they don't want to lose their jobs.” – MA 2

Both advisors try to have a fast turn-around. MA 1 usually gives a response within a week of getting the referral from the TPA, while MA 2 tries to give his recommendation by the same or next day, as long as the information is already collated.

“This type of thing [leptospirosis], people want to get one with their lives. And it's an easy decision to make, unless you need to get [more] information... But the delay is often getting the information, the forms in from the doctor, from the employer. The employer can be quite reluctant to provide anything, so we just forget about that sometimes. But technically, there's probably a couple of weeks goes by before they get the appropriate information.” – MA 2

Insufficient information can lead to denial of cover, but the claimant can appeal the decision once further information is provided.

“If we don't receive the information we requested, we then try to look and see if we're in a position to make a decision or not. And if we can't, then we would look to decline a claim... for 'lack of information' and say we haven't actually been provided the information we required to make a decision.” – TM

“There's no determining factor in terms of how much information a provider needs in order to lodge a claim...They can lodge a claim whenever they like, the question is simply around whether or not they have enough information to support that decision.... The issue is if they lodge a claim before they have any of the tests, if we don't get those tests back, then at that point we will likely decline the claim for lack of information. But if we do decline a claim for lack of

information, it doesn't mean we can't go back and reconsider when the information is provided." – TM

2.3 Discussion

The following section discusses the key findings from the document analysis and interview results and their implications within the compensation process for leptospirosis.

2.3.1 Key findings about specific steps in the process

TP recognition is a crucial make-or-break point in the process

Getting the TP to suspect leptospirosis is a crucial make-or-break point in the process because it is the step that dictates two critical actions points, i.e. forming a treatment plan and ordering laboratory tests. Laboratory results are critical requirement during claim assessment, and their absence may lead to denial of cover on the grounds of insufficient information. The claims assessors commented on the importance for treatment providers to have a high index of suspicion. Having a high index of suspicion means being alert to the possibility of leptospirosis given the presence of certain symptoms and certain exposures.

The 2007 DoL report acknowledged that doctor recognition of leptospirosis needs improvement (Keenan, 2007). In the case series of leptospirosis patients reporting persistent symptoms by Weston et al. (n.d.), four of the five of the participants recounted instances of physicians failing to recognise or attribute their initial acute symptoms to leptospirosis – in one case, the doctor had to be persuaded by the patient to order laboratory tests while in another, the doctor insisted the patient merely had the flu, despite being told by the patient that he recently vaccinated his cattle herd for leptospirosis. The problem of doctor recognition was less prevalent in Adams' (2002) study, where four GP's recognised the possibility of leptospirosis and promptly administered antibiotics despite the diagnosis having not yet been confirmed. From a patient standpoint, Adams (2002) also found that how quickly doctors latch on to the possibility of leptospirosis greatly contributes to how satisfied the patients were about the level of care they received. Doctor recognition then is

important in not just treatment and compensation, but also in the patient experience of the disease.

The appropriateness of the exposure is as important as proving that the condition exists

The interview with TM stressed the importance of having an appropriate exposure. This importance may not be as similarly appreciated by persons other than the claim assessors; only TP 3 brought up an instance where inappropriate exposure was given as the reason for the claim denial (see serovar discussion above). This is understandable, as the treatment providers would no doubt be more concerned with the medical aspects of the claim.

However, the claim assessors place equal importance in having both the condition and an appropriate exposure; it is not enough for a claim to only fulfil the case definition of leptospirosis, it must also pass the assessment for exposure. This applies even to Schedule 2 claims, where the assessment of exposure is supposed to be less stringent (i.e. no longer having to exclude non-work sources of exposure). The claim assessors look not only at the patient's work task and work environment but also at the timing between the exposure and the symptoms, i.e. the assessors would check if the incubation period for leptospirosis is consistent with the timeline of symptoms.

The disparity in the level of emphasis on exposure could be tied to the observation by Forster et al. (2017) that there is a gap between ACC's understanding of causation and the general public's understanding of causation, and this difference in understanding is what drives some of the grievances against ACC.

2.3.2 Key findings about the factors that affect the process

The experience of the treatment providers influences their familiarity with the disease manifestation and with the laboratory criteria

In this study, all the TPs demonstrated good familiarity with leptospirosis. This is an expected outcome, given that the participants were invited because of their experience in dealing with the disease. This familiarity is in part due to their decades of experience, and also due to the proximity of their practice to meat plants. Other

physicians who less frequently encounter leptospirosis patients may not be as attuned to the signs of the disease, and this may lead them to delay or omit ordering laboratory tests. Given that the suitability of a laboratory test is dependent on the temporal stage of the disease, a delay could impact the claim's chances of getting cover. The 2007 DoL report noted that there are numerous accounts of delayed ordering of laboratory tests by physicians (Keenan, 2007, p. 46).

Another thing the TP's showed good familiarity with are the laboratory criteria for a confirmed case. The most mentioned laboratory criterion was the four-fold increase in titres from paired samples in MAT. However, two of the TPs also referred to the single MAT titre level stated in the ACC 2014 review document. The titre level for a single MAT sample is one of the inconsistencies between ACC's 2014 case definition and MoH's case definition. MA 2 mentioned in the interview that ACC now accepts the same titre level as that stated in the MoH guidelines. Whilst this development clears up one of the inconsistencies in the laboratory criteria, the fact that TPs are unaware of the updated ACC definition is still cause for concern.

The recognised gatekeeping role that doctors play in the compensation process (Lippel, 2012) means that this can lead to a chance, however slim, that a treatment provider who is unaware that ACC now accepts the lower MoH threshold would incorrectly assume that a claim need not be lodged as it would be denied anyway. Interestingly, MA 1, by using the guidelines from MoH to verify the case definition, would more likely be following the same case definition as those of the treatment providers, leading to less possibilities for inconsistent diagnoses.

Claim eligibility is sometimes affected by patient non-compliance with paired sampling

The TPs' experience regarding patient compliance varied. TP 3 noted that it was a problem that led to a "significant number" of patients not getting compensation, but TP 2 did not see it as a concern. Remember though that TP 2 also serves as the company doctor for a meat plant and visits the clinic there once a week; there is also a full-time occupational nurse there to help TP 2 keep on top of patients who need to go back for a second sample. It is understandable then that patient compliance

would be less of a concern for TP 2 than it is to TP 3, who does not have the same access to patients.

TP 3's observation about patient compliance was also echoed by both advisors, suggesting that the phenomenon is a common enough occurrence. Patient non-compliance could help explain Keenan's (2007) observation that only a small portion of notified cases come through as leptospirosis claims. As medical practitioners and laboratories are required to report every possible case of leptospirosis they encounter, a case with only one sample tested might show up in the number of notified cases but not be registered as a claim due to having only one sample.

Some of the possible reasons for patient non-compliance were brought up during the interviews. For some patients, it could be because they already felt better and saw no benefit in pursuing the claim; however, for others, their reluctance to pursue a claim is because they want to avoid upsetting their employers. The impact of employers in the process is discussed in a later section.

Causation assessment can be confounded by titres not always matching up with the clinical presentation

Most of the treatment providers felt that the procedures for claim lodgement and the subsequent communication with the claim assessors are straightforward, especially for cases where the MAT results reach the threshold levels. However, all primary care TPs have seen cases where the patients display symptoms indicative of leptospirosis and have a plausible exposure route and yet have cover denied anyway due to MAT titres not being high enough.

There is evidence that titre levels do not always correspond to symptom severity; Bharti et al. (2003) observed that antibody titres might still be at moderate levels despite high-grade bacteraemia. The explanation for why an individual may have low antibody titres is not yet known; in fact, the exact mechanisms that determine the clinical manifestations, including antibody titre response, are still unclear (Murray, 2015). Various reasons have been proposed, such as a patient's low immune health producing a weaker immune response (WHO, 2003), low serovar

pathogenicity (Ko et al., 2009) and background level of exposure affecting antibody production (Levett, 2001). However, the exact explanation remains uncertain.

The lack of knowledge on the exact mechanisms that give rise to symptoms also affects cases of chronic leptospirosis, where the absence of a definitive test that proves the causal link between the persistent symptoms and the disease has contributed to some scepticism. Despite the uncertainty of what gives rise to these long-term symptoms, some authors caution against outright dismissal of such testimonies, especially in light of the number of reported cases over the years (Adler & de la Peña Moctezuma, 2010).

Going back to the issue of insufficient antibody titre levels and their being used as proof of no illness, it is interesting to note here that such cases (i.e. symptoms plus appropriate exposure) might have been accepted in earlier years. The 2007 DoL report noted that the ACC case definition in that time was:

“An illness characterised by fever, headaches, chills, myalgia, conjunctival suffusion, and less frequently meningitis, jaundice, or renal insufficiency. Because the presentation of illness in anicteric (i.e. not associated with jaundice) cases is non-specific it is important to correlate the illness with exposure (ACC Review: Leptospirosis in New Zealand July 2004)” (Keenan, 2007, p. 13).

Note that the definition given above made no mention of laboratory results and relied more on symptoms plus exposure. The definition is also admittedly vague, and therefore may have been a source of confusion or disputes. The 2007 DoL report called for greater clarification of the medical criteria, and it seems this has been addressed by ACC in the intervening years between that report and the present. ACC’s solution was seemingly that of strict adoption of titre threshold levels. This solution may have removed a lot of ambiguity and made the causation assessment clearer, but it may also have led to some ill patients not receiving compensation because for some inexplicable reasons, their titre levels were not high enough to prove causation.

In saying that, this paper does not advocate going back to old case definition. It also acknowledges that ACC's adoption of titre levels is, barring a few inconsistencies, in tune with the case definition of MoH, indicating that ACC is responsive to new information about the disease and that the inclination to use titre levels as an indicator of illness is concurrent with the practices of the wider medical community.

For treatment providers, making the patient well supersedes concerns about meeting the insurance criteria

There is strong evidence that prompt administration of antibiotics can reduce the chance developing severe symptoms (Haake & Levett, 2015). It is therefore not surprising that all TPs in this study elected to treat on the basis of suspicion. However, they were also aware of the possibility that antibiotic therapy might impede compensation.

Administration of high doses of antibiotics in the early phase of the disease has been suggested as a possible reason for a low titre or delayed response (WHO, 2003) – along with other possible reasons discussed in the above section – but this has not been definitively proven. A recent study by Courdurie et al. (2017) did not see an association between precocious antibiotic therapy and a lower test sensitivity but that study only used ELISA tests and not MAT. Apprehension about antibiotic administration affecting serological results remains and has led some to recommend PCR for patients that have already taken antibiotics (Bharti et al., 2003; Musso & La Scola, 2013).

There are conflicting views among treatment providers and medical advisors on PCR as a viable alternative to MAT

Of the four TPs in the study, three have expressed a preference of PCR over MAT. The reasons given were (a) earlier confirmation from PCR versus MAT, (b) the paired sampling is affected by patient non-compliance, and (c) the possibility of early antibiotic treatment leading to lower titres in MAT. The first and last reasons relate to their primary responsibility to treat the patient, with compensation as a secondary concern. Getting a confirmation of the diagnosis as soon as possible helps the medical provider formulate a more accurate treatment plan.

Only TP 3 raised specific concerns about ACC not registering claims on the basis of PCR results alone, but this could be because the other primary care TPs either only dealt with AE/TPA (TP 2) or did not mention using PCR (TP 1). TP 4 uses PCR but the liaison officer did not mention problems with ACC failing to register claims on the basis of having PCR results alone. This concern was raised in the interview with TM, and while they contradicted the assertion that ACC would not register the claim that only had PCR results, they did note that there is a time limit for ACC to make a decision, and if a claim comes in with what they consider insufficient information, they will request additional information which has to be furnished within the time limit. The answer from TM means that the registration of the claim into the ACC system is no longer in question; however, the issue with ACC not accepting PCR as a sufficient proof of illness remains a concern.

MA 2 explains that this hesitancy to accept PCR results is because of past experience with false positives from PCR, mentioning two back-to-back incidences from one laboratory in early 2017/18. Whilst a little wariness is understandable, the back-to-back cases may just be an aberrant episode; what's more, given that no additional incidences were mentioned, it may have already been addressed by the particular laboratory.

The insistence on waiting for MAT results, which often entails paired sampling, means a longer waiting time for both treatment provider and patients. For patients, this waiting time introduces an element of uncertainty during the period of illness and recovery and adds to their stress. For some, this waiting time also corresponds to a period of financial anxiety; in the Adams (2002, p.79) study, nine of the ten patients received no income, once sick leave has been used up, in the time it took for the insurer to investigate the claim.

It should be noted that the guidelines from MoH (2017) do recommend that both PCR and MAT be conducted improve diagnostic accuracy. Other studies also recommend a combined testing strategy in order to maximize case detection (Musso & La Scola, 2013; Waggoner & Pinsky, 2016). However, the current case definition for a confirmed case, as is stated in both the MoH guidelines and the 2014 ACC leptospirosis review document, can be satisfied with just a PCR result.

The MoH recommendation of using two tests may be due in part to PCR's inability to detect the infecting serovars; serovar information is important in tracking the epidemiology of the disease in the country and is therefore a sought-after data by health authorities, leading to the recommendation to perform MAT as well as PCR.

Previously, serovar type was a factor for consideration for compensation. TP 3 mentioned that they had experience of past claims being denied on the basis that the infecting serovar was not typically associated with the animal host the claimant came into contact with. Some of the participants in Adams (2002, p. 91) study also reported similar instances. However, this is no longer the case for ACC; MA 2 himself acknowledges that they no longer factor in the host-serovar association. This paper considers this a welcome development, since the host-association should not be thought of as a rigid association but more of an indicator of the animal-human interaction in an area (Bharti et al., 2003). Any susceptible mammal can be infected with and be a carrier of any of the pathogenic serovars (Haake & Levett, 2015). Given then that one of the disadvantages of PCR is no longer a concern for ACC, the continued preference for MAT becomes even more conspicuous.

It should be noted that the above discussion should not be taken as a recommendation of one test over another, but rather a description of the impacts of the observed inclination. This study makes no assertions on the overall superiority of one test over another.

The closeness between treatment providers and insurers may have an impact on the cover decision

The TPs' closeness with insurers differs by organisation, with TPs reporting an easier time dealing with AE/TPA than ACC. ACC, by virtue of it being a very large organisation, might tend to be more bureaucratic than an AE/TPA. This could produce a more distant relationship between ACC and the treatment provider compared. The patients in the Adams (2002) study have also reported frustration with the bureaucracy of the ACC system.

In contrast, the smaller organisational structure (at least in terms of a compensation administration) of an AE/TPA might result to a closer and more familiar association

with the treatment provider, especially when the treatment providers also serve as company doctors for the employer. Company doctors do not determine compensation, that is still up to the AE/TPA. However, their medical expertise might have more influence on AE/TPA, i.e. their diagnosis of leptospirosis might be accepted at face value.

An interesting note here is that the requirement for a medical advisor to be consulted about a leptospirosis claim is a specific policy within ACC; AE/TPAs are not bound by ACC policy, only by the legislative requirements. The legislative requirements only ask for a medical diagnosis of leptospirosis, which is already provided by the TP. If the TP and the AE/TPA have a good working relationship, the latter may bypass sending the claim to a medical advisor for comment and instead decide on cover on the basis of the TP's diagnosis. This is the experience of TP 1, where in the meat plant (an AE) that he works at as a company doctor often accepts his diagnosis at face value and will at times forego sending the claim out for external assessment.

The level of trust or confidence demonstrated in TP 1's case might be absent or diminished in the TP-ACC interchange, because of the distance created by the policies and bureaucratic nature of ACC. The lack of confidence goes both ways, with some TPs relaying instances where they believed that ACC made a wrong cover decision and rang ACC. For such instances, the TP's persistence to contact ACC on behalf of their patient may also be influenced by their level of experience, which can boost their confidence in their diagnosis; a physician with less experience might not be as tenacious in appealing the decision.

Employer reluctance to provide information or accept liability can complicate claim assessment

MA 2 mentioned instances where employers are reluctant to provide information because they wish to contest liability. This is also an observation in Adams' 2002 study, noting that employer actions appear to unnecessarily extend the claim assessment; examples of such actions include delaying filing of reports to ACC or questioning the work-relatedness of the exposure. Adams (2002, p. 82) observed that this resulted in patients, who are already struggling with ill health, having to expend resources and energy to fight to get their claim accepted.

For employers who stay with ACC, this reluctance to accept liability is tied to how their safety record affects their Work levy. Under ACC's Experience Rating Programme (see discussion in section 1.2.3) an employer's levy may be increased from 10% to as much as 75% based on their claims history (ACC, 2019b). MA 2 is familiar with the issue of employer reluctance and makes allowances for the lack of information from the employer; MA 2 would try to make do with just the information from the claimant, and in most cases, that would be sufficient.

MA 2's work around means that within the ACC scheme, employer reluctance represents a bump or detour in the compensation track. However, when viewed within the context of the AEP, employer reluctance could present a much greater hindrance. Keenan (2007) in the DoL report found that employers do not always appreciate issues of cover for leptospirosis and that in the view of the Meat Workers Union, "this problem was even worse with employers who were part of the ACC Partnership programme [another name for the AEP]" (Keenan 2007, p. 33). Remember that the AEP gives AEs oversight over their employees' workplace claims, therefore, an AE who is reluctant to accept liability may find various ways to obstruct the compensation process. An example can be seen in the Adams (2002, p. 93) study, where the AE of one participant failed to inform him of his right to apply for compensation; it was only after he spoke with an Occupational Safety and Health inspector did the worker realise that he could take action.

No accounts of AE/TPA reluctance were raised in the interviews. That, along with the claims statistics showing a higher acceptance percentage from AE/TPA, could indicate this is not a current problem with AEP. However, the higher claims percentage could also be due to cases being dismissed even prior to registration. There could be many reasons for the disparity in the claims percentage but unfortunately, this study is not equipped to discover those reasons.

2.4 Chapter Summary

In summary, this chapter presented the study goals and objectives and described the methods used to achieve them. It also presented the diagram of the claims process up to cover decision and the key findings from the interviews, and then discussed their implications within the compensation process.

Chapter 3

Conclusion

This chapter summarises the key findings of the study and presents recommendations regarding the gaps found within the process.

3.1 Summary of the study findings

Going back to the research objectives stated in section 2.1, the objectives were three-fold: to find out the requirements for leptospirosis claim, to determine what happens to a claim after its lodgement, and to discover factors that could affect claim assessment.

The requirements (presented in section 1.3) showed that a leptospirosis claim must satisfy both statutory and medical criteria. The statutory requirements, especially those related to the exposure, are set in legislation and can be affected by wider institutional changes; ACC's implementation of its policies and procedures have been influenced by the numerous amendments of its principal act since its inception.

The medical criteria meanwhile rest on the case definition of the disease, made up of the clinical manifestation and laboratory results, and which may also change according to new knowledge about the disease. The laboratory results are themselves affected by numerous variables such as the stage of the disease, patient compliance with regards to sample giving, and by the prescribed antibiotic treatment.

The medical aspects of the claim undergo assessment twice by medical professionals, first by treatment providers even prior to claim lodgement, and second by insurance medical advisors after claim registration. The conclusions (i.e. diagnoses) reached by said professionals may differ, depending on their views on PCR as an alternative test to MAT.

The level of experience of the physicians affect how they conduct their assessment. Treatment providers who encounter leptospirosis patients frequently may be more attuned to the signs of the disease and more adept with complying with the provisions of a claim. The experience of the medical advisors is a factor in how they assess a claim, like making allowances for certain instances of employers failing to provide information.

Aside from the medical criteria, the claim also needs to pass the assessment for appropriate exposure. Information about the exposure is requested from the patient and the employer. Instances of employer reluctance to provide information have been observed, and this may affect a claim's chance of being granted cover.

3.2 Study reflections and recommendations

The results of this study should be interpreted with caution due to the small number of participants. In addition, this was primarily intended as an exploratory study to generate findings to aid future investigations.

With that in mind, the following recommendations hope to address some of the gaps identified in the study:

Communication of the causation criteria used to assess a leptospirosis claim should be improved

ACC lowering the threshold titre for the single MAT sample, in keeping with the MoH criteria, is welcome news, but the fact that this updated information was not widely known outside of ACC is not. While ACC is not required to make the causation criteria readily available in their website, improving the transparency and access to these updated criteria could make it easier for treatment providers to comply with the claim requirements.

Better communication here refers not just to updated case definition but also to conveying the importance of having an appropriate exposure. The exposure aspect of a claim does not seem to be as keenly appreciated by persons outside of the claim assessors and improving this might help claimants manage their expectations about the claim better.

Conflicting views about laboratory results should be resolved

This goes hand-in-hand with the first recommendation. The conflicting views regarding PCR may be a bigger concern in the years ahead, as more treatment providers turn to PCR for its speedier results. It is therefore ideal to reach a consensus about its use now.

Another issue that calls for dialogue is regarding low titre levels in patients that exhibit symptoms for leptospirosis. Of course, insurers may very well view this issue as already resolved, i.e. when it comes to evidence of illness, the titres outweigh the symptoms, especially as the latter can be caused by other conditions. However, it may still be of benefit to hold a discussion about such cases, as it would provide a

forum for laying out the different views on the issue. It may also be prudent to recall the original intentions of Woodhouse et.al (1967) in removing the fault principle, i.e. the point of compensation is to not on who is to blame for the injury, but on addressing the consequences of injuries; it can be argued here that symptoms and the suffering borne by the patient are very much a consequence while titres relate more to causes.

Future studies to examine the compensation experiences under AEP versus ACC

The influence of AEs was only really lightly touched upon in this study. Yet it seems to be an area where plenty of misgivings abound but have very few concrete studies to back up the concerns. The results from this study seem to show that from the treatment providers perspective, AEs are actually easier to deal with. But what about the patient experience? No study was found that specifically compared the compensation experience of workers under AEP versus ACC. What is more, most of the documentation that exists about AEP is from the perspective of employers and TPAs. More worker-focused studies on AEP is therefore recommended, in order to see how well workers have fared under this decades-long programme.

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Appendix 1 Low Risk Ethics Notification Letter



Date: 11 February 2019

Dear Abbie Uy

Re: Ethics Notification - **4000020557 - Compensation of occupational leptospirosis in New Zealand**

Thank you for your notification which you have assessed as Low Risk.

Your project has been recorded in our system which is reported in the Annual Report of the Massey University Human Ethics Committee.

The low risk notification for this project is valid for a maximum of three years.

If situations subsequently occur which cause you to reconsider your ethical analysis, please contact a Research Ethics Administrator.

Please note that travel undertaken by students must be approved by the supervisor and the relevant Pro Vice-Chancellor and be in accordance with the Policy and Procedures for Course-Related Student Travel Overseas. In addition, the supervisor must advise the University's Insurance Officer.

A reminder to include the following statement on all public documents:

"This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research."

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director - Ethics, telephone 06 3569099 ext 85271, email humanethics@massey.ac.nz."

Please note, if a sponsoring organisation, funding authority or a journal in which you wish to publish requires evidence of committee approval (with an approval number), you will have to complete the application form again, answering "yes" to the publication question to provide more information for one of the University's Human Ethics Committees. You should also note that such an approval can only be provided prior to the commencement of the research.

Yours sincerely

Research Ethics Office, Research and Enterprise
Massey University, Private Bag 11 222, Palmerston North, 4442, New Zealand **T** 06 350 5573; 06 350 5575 **F** 06 355 7973
E humanethics@massey.ac.nz **W** <http://humanethics.massey.ac.nz>

Appendix 2 ACC OIA response

Page 1 of 8



04 April 2019

Abbie Uy
Abbie.Uy.1@uni.massey.ac.nz

Dear Abbie

Your Official Information Act request, reference: 0053872

Thank you for your email of 12 March 2019, asking for information relating to occupational leptospirosis in New Zealand. You have asked for the following information:

1. *The form/s used to lodge a leptospirosis gradual process claim*
2. *The requirements needed to decide on a leptospirosis gradual process claim*
3. *The guidelines/criteria used by ACC to assess a leptospirosis gradual process claim, specifically the laboratory and/or clinical criteria*
4. *In relation to point (3), are Accredited Employers and/or Third-party administrators required to employ the same criteria/guidelines? If so, how does ACC monitor their compliance?*
5. *The number of leptospirosis gradual process claims lodged to ACC, by decision and by year, starting from the time Leptospirosis was included in Schedule 2 of the ACC Act*
6. *The number of leptospirosis gradual process claims lodged to Accredited Employers, by decision and by year, in the same period as point (5)*
7. *The common reasons for rejection of cover for leptospirosis gradual process claims*
8. *The assessment procedure for a leptospirosis gradual process claim*
9. *In relation to point (8), do Accredited Employers and/or Third-party administrators follow the same procedure?*

Lodgement and assessment of a leptospirosis claim (items 1,2,3 & 8)

A claim for leptospirosis gradual process is lodged with an ACC45 Injury Claim form. ACC then requires confirmation of the diagnosis and evidence of occupational exposure. A diagnosis of leptospirosis is made retrospectively using the microscopic agglutination serological test (MAT) in association with typical clinical features. In most cases, ACC will need two MAT results 10-14 days apart. The delay with ACC making a decision on these claims is usually because we are waiting on the MAT tests.

Regarding the assessment process, a claim is assigned to a Case Coordinator once the claim is registered. The client is contacted and medical notes are requested. ACC needs confirmation of a client's work history to ensure they had occupational exposure. Therefore, the client's employer must be notified, however, quite often clients are self-employed.

Once ACC has the relevant information, the claim is referred to ACC's Lead Occupational Health Advisor for comment. As the condition is listed in Schedule 2 of ACC's legislation, the final cover decision is made on the advice from the Lead Occupational Health Advisor.

For your information, enclosed is an example of two laboratory reports outlining screening tests. In line with section 9(2)(a) of the Act, personal details of the client have been withheld to protect their privacy. We have also enclosed the document 'ACC Review 54, May 2014. Leptospirosis in New Zealand' a fact sheet produced by ACC outlining the cause, clinical manifestations, diagnosis, treatment and prevention of leptospirosis.

Accredited employers and/or third-party administrators (items 4 & 9)

Accredited Employers (AEs) and Third-party administrators (TPAs) are bound by the same legislation and regulations as ACC. Essentially, they 'stand in ACC's shoes' to manage their workplace injuries. ACC monitors AEs and TPAs through its annual audit process, and through injury and claim management monitoring activities. ACC does not specifically monitor leptospirosis gradual process claims being managed by an AE or a TPA.

However, AEs and TPAs are not bound by ACC policy. They will have their own claims management policies and procedures for managing these types of gradual process claims. ACC would expect that these will reflect the requirements of the ACC legislation and any relevant regulations.

Leptospirosis gradual process claim statistics (items 5,6 & 7)

Leptospirosis by gradual process was included in Schedule 2 of the ACC Act in April 2002. However, we are not providing claim data prior to 2007 as ACC changed its database systems at that time, and any claim data prior to 2007 would not be complete. The data we are therefore providing includes the last 12 financial years from 2006/07 to 2017/18. Data was extracted on 25 March 2019 and may differ if re-run at a later date.

The attached appendix outlines data regarding new leptospirosis gradual process claims broken down by cover decision, claims lodged with AEs and reasons for declined claims. AEs are required to send claim information to ACC on a regular basis, however, ACC cannot guarantee the accuracy of the data provided in Table 2.

ACC does not disclose data below a certain level to protect the privacy of individuals. This decision is made under section 9(2)(a) of the Act. Accordingly, we have used the value <4 where the claim count is less than four. This limits the potential for particular individuals or matters specific to certain individuals being identified. Withholding in this way is necessary to protect the privacy of these individuals. In doing so, we have considered the public interest in making the information available and have determined that it does not outweigh the need to protect the privacy of these individuals.

Any queries

If you have any questions, you can email me at GovernmentServices@acc.co.nz.

If you are not happy with this response, you have the right to make a complaint to the Ombudsman. Information about how to do this is available at www.ombudsman.parliament.nz or by phoning 0800 802 602.

Yours sincerely



Emma Coats
Manager Official Information Act Services
Government Engagement & Support

Appendix

Table 1: Number of new leptospirosis gradual process claims lodged with ACC between 1 July 2006 and 30 June 2018 broken down by claim cover decision.

Lodgement Financial Year	Accept	Decline
2006/07	24	13
2007/08	12	12
2008/09	23	13
2009/10	17	14
2010/11	12	7
2011/12	17	9
2012/13	11	15
2013/14	11	7
2014/15	14	13
2015/16	16	10
2016/17	24	19
2017/18	17	16
Grand Total	198	148

Table 2: Number of new leptospirosis gradual process claims lodged with Accredited Employers between 1 July 2006 and 30 June 2018 broken down by claim cover decision.

Lodgement Financial Year	Accept	Decline
2006/07	26	9
2007/08	21	8
2008/09	17	15
2009/10	11	6
2010/11	10	5
2011/12	13	<4
2012/13	15	4
2013/14	11	5
2014/15	4	4
2015/16	6	<4
2016/17	8	4
2017/18	9	<4
Grand Total	151	67

Table 3: Number of declined new leptospirosis gradual process claims lodged with ACC between 1 July 2006 and 30 June 2018 broken down by reason for decline.

Reason for decline	Claim count
No Occupational Gradual Process	93
Exclusionary Criteria Apply	22
No Physical Injuries	18
Injury Not Result of Accident	6
Other	9
Grand Total	148

Patient: [REDACTED] Sex: M; DOB: [REDACTED] Age: [REDACTED] Page 1 of 1

Name [REDACTED]
NHI [REDACTED]
Sex M
Date of birth [REDACTED]
Printed by [REDACTED]



ESR SENDOUT

[REDACTED]

Ref Lab No:	1402724795	1402686655
ESR Lab No:	141P0220A	141P0221A
Sample Type:	Acute Serum	Convalescent
Date Collected:	23 May 2014	2 June 2014
Leptospira Serology:		
L. Copenhageni MAT	25	25
L. Tarassovi MAT	<25	<25
L. Ballum MAT	<25	<25
L. Canicola MAT	<25	<25
L. Grippityphosa MAT	<25	<25
L. Australis MAT	25	<25
L. Hardjo MAT	<25	100
L. Pomona MAT	<25	<25
Summary of Results:	Positive	
Leptospira Causative Agent:	Leptospira Hardjo	
Comments:		
A 4-fold or greater increase in titre is indicative of a current or recent infection.		
Leptospirosis is a notifiable disease.		
Reported by: SMT -RLP		

Leptospirosis in New Zealand

An overview of clinical best practice

May 2014

ACC Review 54

Although leptospirosis is not regularly encountered in the typical urban New Zealand general practice, knowledge of this disease is important. Leptospirosis is an under-diagnosed notifiable disease, with a true rate much higher than the number of notified cases. Rural GPs should always consider leptospirosis in a patient with a flu-like illness who has risk factors such as working on a farm or in meat processing.

Background

Leptospirosis is the most commonly notified zoonotic disease in New Zealand with 80–180 laboratory cases reported each year. Although approximately 20 species and 230 serovars have been described world-wide, fewer than 10 different serovars have been isolated from human cases in New Zealand.^{1,2} Transmission to humans is via the urine of contaminated animals, either directly or in the water or soil. *Leptospira* gain access to the circulation by penetrating abraded skin or intact mucous membranes and ultimately penetrate various tissues, resulting in a systemic illness with a wide spectrum of clinical features.^{1,2}

Epidemiology

The notified incidence of leptospirosis in New Zealand has decreased from around 20 cases per 100,000 in the 1970s to 2.5 cases per 100,000 in 2012^{3,4} with 80% occupationally acquired. Vaccination of dairy and pig herds and improved occupational safety are considered to be key contributors in this decline. Sheep and cattle are the greatest source of human disease in New Zealand,⁵ with farmers and farm workers having the highest incidence. Meat-processing workers are the second largest occupational group, although notifications in these industries have declined markedly over the last decade.⁴ Recent research suggests that ESR notifications of leptospirosis in abattoir workers may be seriously under-reported by a factor of 40–50 times.⁵ Recreational activities around lakes and rivers account for most non-occupational cases. In 2012, most of the 113 cases reported were male (92%), with the highest age-specific rate in the 40–49 year age group. Although no leptospirosis-related deaths have been reported in recent years, approximately 60% of notified cases are hospitalised.⁴

Clinical and Laboratory Features

The course of the disease is variable, with sub-clinical and self-limiting systemic illness in greater than 90% of cases. Severe illness accompanied by multi-organ failure is uncommon in New Zealand.¹ The incubation period is usually 5–14 days, but can range from 2 to 30 days.¹

The predominant early clinical features are:

- fever, rigours

- Leptospirosis is the most important zoonosis in New Zealand. It is a notifiable disease and should be reported to the local medical officer of health.
- *Leptospira* organisms are carried by many farm animals (cattle, sheep, deer, pigs, dogs) and rodents (rats, hedgehogs, possums), and are excreted and transmitted via the urine of infected animals.
- The incidence of infection is highest in males in high-risk occupations, particularly livestock farmers and meat workers.
- There is consensus that suspected leptospirosis should be treated early.
- If unsure about diagnosis and treatment options, contact an infectious diseases specialist for advice.



Please send your feedback to ACCReviewFeedback@acc.co.nz

- sudden onset of headache with possible photophobia
- muscle pain and tenderness
- conjunctival suffusion
- skin or mucosal rash.

Severe cases can develop significant jaundice, spontaneous bleeding, renal failure and respiratory failure. Although most people fully recover within a month, some reports in uncontrolled studies suggest that a minority of people may develop a chronic fatigue-like illness.⁶

Laboratory investigations that support the possibility of leptospirosis include the finding of lymphocytopenia or thrombocytopenia in up to 50% of cases. Increases in transaminases are commonly seen on liver function testing.

Definitive diagnosis requires culture, molecular biology (e.g. PCR) or serological testing. In New Zealand, leptospirosis diagnoses are usually made using the microscopic agglutination serological test (MAT). Unfortunately, MAT serology will usually be negative in the first seven days of illness, highlighting the importance of both acute and convalescent serology to make the diagnosis. MAT serology is also not completely specific, with cross-reactivity between serovars. As a result, the presumptive serovar based on the MAT can only give a broad idea of the serovars present at the population level and is of limited value for identifying the infecting serovar in an individual case of leptospirosis in humans.⁷ Only culture and molecular techniques can give exact serovar data.

Differential Diagnosis

The symptoms and signs associated with leptospirosis are non-specific, with a wide range of other conditions presenting with similar symptoms, particularly when patients present early. Prolonged febrile myalgic illness for greater than 72 hours, characteristic haematological and liver function abnormalities (as described above) and the ruling out of alternative diagnoses, such as influenza, pneumonia, meningitis, viral hepatitis, septicaemia and EBV infection, make the diagnosis more likely. In the North Island, murine typhus, also a rural-based infection, has a very similar clinical presentation and laboratory findings.⁸ Only specific leptospirosis blood tests can confirm the diagnosis.

Case Definition

Confirmed – a clinically compatible illness that is laboratory confirmed by leptospira isolation or PCR; or a fourfold or greater rise in leptospiral MAT between acute and convalescent sera or a single raised titre of

≥800 on MAT.

Probable – a clinically compatible illness with a single raised titre of ≥200 on MAT.

Treatment

Treatment differs depending on the severity and duration of symptoms at the time of presentation. Evidence regarding the effectiveness of antibiotic treatment is inconclusive,⁹ but there is a consensus view that early antibiotic treatment with doxycycline 100mg bd (5-7 days) or amoxicillin 500mg tds (5-7 days) should be given if there is strong clinical, epidemiological and laboratory suspicion of infection.¹⁰

All patients with severe infection or signs of meningitis should be referred to hospital immediately, where they are likely to be treated with either IV benzylpenicillin 1.2gm 6 hourly or ceftriaxone 1gm daily for 5-7 days.

Prevention

Adequate vaccination of farm livestock is a vital to reduce human cases. Other preventive measures include workplace safety measures like handwashing, covering cuts, and avoiding eating, drinking and smoking in high-risk environments with exposure to animal urine. Good communication between local GPs, vets and at-risk occupational groups can improve awareness and minimise the risk of leptospirosis.

Issues Relevant to ACC

Patients with leptospirosis as a result of their employment are eligible for ACC cover. The required standard is that of a confirmed or probable case as per the case definition outlined above. ACC accepts such claims, unless the leptospirosis arose from non-work exposure. For each claimant, a form must be completed by medical practitioner, employer and claimant.

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Appendix 3 Interview questions for the treatment providers

Page 1 of 2

Questions for Group A – GPs and Hospital-based Physicians

- Check that digital recorder is turned on.
- Re-confirm consent to be interviewed and recorded.

Name: _____

Date: _____ Location: _____

Interviewer: _____

A. Familiarity with occupational leptospirosis

1. What do you look for when assessing a case as a probable occupational leptospirosis?

2. Could you please describe the steps you'd take, and the tests you'd order to confirm diagnosis?

B. Familiarity with insurance criteria of occupational leptospirosis

Note: 'Insurer' may refer to ACC or to Accredited Employers, who are large companies that either self-manage their own workplace compensation or contract it out to third-party administrators such as WellNZ, WorkAon, Gallagher Bassett, etc. Thus, workplace injury or illness claims ("worker compensation") may be processed through the ACC scheme or the Accredited Employers scheme. Claims for employees who work for Accredited Employers are not handled by ACC.

1. What requirements does the insurer ask from you to support the claim?

2. In terms of communicating the criteria or requirements, how would you describe the information flow between you and the insurer?

C. Experience with cover

1. What is your experience with acceptance or rejection of cover?

2. In your experience, is there a difference when dealing with ACC compared with Accredited Employers and/or third-party administrators?

Bonus Question (only if there is still time):

Is there anything else you'd like to tell me about your experience as an attending physician with regards to leptospirosis and worker compensation?

Appendix 4 Interview questions for the medical advisors

Page 1 of 2

Questions for Group B – Medical advisors/claims assessors

- Check that digital recorder is turned on.
- Re-confirm consent to be interviewed and recorded.

Name: _____

Date: _____ Location: _____

Interviewer: _____

A. Requirements for cover

1. What do you look for when assessing a claim?

2. What are the requirements in terms of documentation do you need?

B. Factors that influence cover decision

1. What factors might influence an acceptance of cover?

2. What factors might influence a rejection of cover?

3. How long do you take to arrive on a decision?

Bonus Question (only if there is still time):

Is there anything else you'd like to tell me about your experience as a medical adviser with regards to leptospirosis and worker compensation?

Appendix 5 Participant information sheet and consent form



SCHOOL OF
VETERINARY
SCIENCE

Compensation of occupational leptospirosis in New Zealand

INFORMATION SHEET

Introduction

This study is conducted as a partial requirement for a Masters in Veterinary Public Health degree. The investigators are Abbie Uy (postgraduate student), Dr. Jackie Benschop (primary supervisor, Massey University ^mEpiLab), Dr. Julie Collins-Emerson (co-supervisor, Massey University ^mEpiLab), and Dr. Gerard Prinsen (co-supervisor, Massey University, School of People, Environment and Planning).

Project Description and Invitation

This is a qualitative exploratory study that aims to map out the specific steps a lodged claim travels, starting from the time the health provider recognises that a patient might be a probable work-related leptospirosis case, up to the point when cover is decided. Key persons at each step will be interviewed about the criteria a claim needs to meet at that stage and how they arrive at their decision.

We would like to invite you to be part of the panel of key informants. You will be asked about your experience with the compensation process of occupational leptospirosis. The results of the interview will be used in conjunction with the findings in the literature to come up with a decision map of the claim assessment process, as well as to identify the gaps that might exist within it.

Participant Identification and Recruitment

The panel will be composed of 2 groups of informants: medical providers (GPs and hospital-based physicians), and insurance medical advisers. Because the scope of the research starts from the health provider and onwards, no patients will be included in the panel of interviewees.

Recruitment of the participants will be done through convenience sampling, i.e. approaching those who fit into one of the categories and who are already known to the researchers and asking them if they wish to be enrolled as an informant or asking them for referrals. The tentative number of informants are 3 - 4 persons per group for a total of 6 – 8 interviewees, although that number might change as the research progresses.

Project Procedures

The interview will be in a semi-structured format, where open-ended but focused questions will be asked. We are hoping to conduct the interview face-to-face, but depending on your availability and preference, we can also do it through video or phone call. Consent will be sought beforehand for the interview to be audio-recorded. We are targeting only one in-depth

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Compensation of occupational leptospirosis in New Zealand

PARTICIPANT CONSENT FORM - INDIVIDUAL

I have read, and I understand the Information Sheet attached as Appendix I. I have had the details of the study explained to me, any questions I had have been answered to my satisfaction, and I understand that I may ask further questions at any time. I have been given sufficient time to consider whether to participate in this study and I understand participation is voluntary and that I may withdraw from the study within the agreed upon time frame.

Declaration by Participant:

1. I agree to participate in this study under the conditions set out in the Information Sheet.
2. I agree/do not agree to the interview being sound recorded.

Full Name:

Signature:

Date: