CONTACT DERMATITIS SEEN AT THE NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH (NIOH) DERMATOLOGY CLINIC

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DECLARATION

I, André Rose, declare that this research report is my own work. It is being submitted for the Master of Medicine (Community Health) degree, at the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

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André Stanford Rose

On the 20th day of May 2010

DEDICATION

I dedicate this research report to my Friend, Lord and Saviour Jesus Christ.

In Him I live and move and have my being.

And without Him this work would never have been completed.

Thank you Mighty One.

"...for the labourer is worthy of his wage."

Luke 10v 7 (NIV)

PUBLICATIONS AND PRESENTATIONS ARISING FROM THIS STUDY

1. Poster presentation at The Wits School of Public Health Research Day, 15 May 2009.
2. Poster presentation at The World Public Health Congress in Turkey, April 2009.
3. Oral presentation at the 5th Public Health Association of South Africa 2009 annual conference in Durban, South Africa, December 2009.

SUMMARY

Introduction

Occupational contact dermatitis (OCD) is the most common occupational skin disease. OCD can be either due to irritants or allergens or a combination of these two agents. Irritant contact dermatitis (ICD) tends to be more common than allergic contact dermatitis (ACD). Skin diseases affect the financial, psychosocial and occupational lives of people. Productivity in the work place is detrimentally affected. OCD is regulated under the Compensation for Occupational Injuries and Disease Act (COID Act) which is administered by the Commissioner. The OCD cases seen at the dermatology clinic at the National Institute of Occupational Health (NIOH) sees a number of cases from a wide spectrum of industries with a variety of exposures but, these are not well described.

Aims and objectives

Aims:

1. To describe the cases seen at the occupational dermatology clinic at the National Institute for Occupational Health (NIOH).
2. To describe the industries and exposure agents of cases diagnosed with occupational contact dermatitis (OCD).
3. To describe the psychosocial, financial and occupational impact and compensation outcomes of cases diagnosed with OCD.

Objectives:

1. To describe the age, sex, diagnosis, site of dermatosis and skin patch test results of cases seen at the occupational dermatology clinic from August 2005 to December 2007.
2. To describe the jobs, the industries and suspected exposure agents of cases with OCD and dermatosis not related to vocation.
3. To determine the duration of exposure to a suspected agent before a diagnosis was made.

4. To describe the psychosocial, financial and occupational impact of the skin conditions.
5. To describe compensation outcomes including claim status, outstanding documentation; the experience of claimants with the Commissioner's office; the delay from submission to resolution.

Methods

Data were collected from the medical records of patients seen at the NIOH dermatology clinic from August 2005 to December 2007 (n=129). Telephone interviews were done with all participants that could be contacted (n=94). A questionnaire was administered by telephone enquiring about their current occupational status and occupational exposures; the impact of their skin disease on their finances, personal lives and vocation; and their experience with the Commissioner's office. The status of claims submitted to the Commissioner's office (n=64) was verified by reviewing the electronic records of the Commissioner's office. Descriptive and analytical analysis was done using STATA 10. Multivariate analysis was done to examine factors that might determine the compensation outcome.

Results

One hundred and twenty eight medical records were reviewed. The mean age of OCD patients was 41.9 years and 48 (75%) were males. ACD was diagnosed in 35 OCD participants and ICD in 29 participants. The rash occurred on the hands in 36 (56.3%) of the 64 OCD patients. The median duration of exposure to a suspected agent was 96.8 months. The median duration from diagnosis to the visit to the Commissioner's office was 19 months. Dermatosis on the hands had an odds ratio of 2.33 for loss of income. There was a greater chance of a claim being resolved if the skin patch test was positive. Only eight of the 64 cases were resolved at the time of the visit to the Commissioner's office.

Discussion

The impact of a skin dermatosis was similar in OCD and non OCD participants and impacted on their social lives and work performance. ICD and ACD were equally represented in the cohort. Workers generally reported a negative impression of the compensation process. There were many systems issues identified in the compensation process. This resulted in few cases being resolved. Many pieces of documentation required for the compensation process to be finalised were missing.

Conclusion

The financial, psychosocial and occupational impact of a skin disease was significant and similar between cases who were diagnosed with OCD and non OCD patients. The COID Act Commissioner had failed to administer the Compensation Fund effectively and to provide compensation to workers diagnosed with OCD.

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Chapter 1 Background and Literature Review

In this chapter the background to the study will be described, the overall research question and its importance. The chapter describes the field in which the research is based and the research question. The justification for the study will be stated. The relevant literature related to the topic will be presented. The aims and objectives of the study will be stated.

1.1 Background

The human skin is the largest organ. It is in constant contact with hazards in the external work environment. The skin is the most commonly affected organ in industry; and skin diseases constitute more than 35% of occupational diseases.[1] Contact dermatitis is the most common occupational skin disease; and is an inflammatory condition of the skin in response to an external agent or a combination of agents.[2] There are two main recognisable types of occupational dermatitis, namely irritant contact dermatitis (ICD) and allergic contact dermatitis (ACD.)[3] According to the Compensation for Occupational Injuries and Diseases Act (COID Act) (amended) no, 61 of 1997, occupational contact dermatitis is a clinical condition that is caused entirely or aggravated by workplace conditions. [4]

The occupational dermatology clinic at the National Institute for Occupational Health (NIOH) is a referral centre for suspected occupational skin diseases. Patients are referred mainly from the Gauteng province but may come from as far afield as the Free State, KwaZulu-Natal and Limpopo provinces. Complicated cases are referred to the clinic as well as cases where a second opinion is required. A specialist dermatologist confirms the diagnosis of OCD in each case seen at the dermatology clinic. A medical scientist with a background in

immunology performs all skin prick and skin patch tests on appropriate patients. Cases that are occupationally related are then referred for compensation under the COID Act.

Compensation of occupational diseases is meant to offer partial income protection to workers as a result of occupational injury or disease.[5] The compensation process in South Africa has failed to protect the financial interests of the worker.[5] Claims are not processed on time and have resulted in loss of income for many workers that depend on these payments. [5]

1.2 Problem statement

The dermatology clinic at NIOH diagnoses a number of OCD cases. The spectrum of industries and the agents the patients are exposed to are not well described. The success rate of OCD cases being compensated is not known neither is the impact of the disease on the patients.

1.3 Justification

Occupational contact dermatitis is an important occupational disease with significant public health importance. It is one of the most common occupational diseases described in the literature. OCD has a poor prognosis but is highly preventable and every effort should be made to prevent it in the workplace. Little is known in South Africa about the prevalence, the industries and the agents that are responsible for this condition.

OCD is compensatible in South Africa under the Compensation for Occupational Injuries and Diseases Act (COID Act) (amended) no, 61 of 1997. There is under-reporting and under-compensation of this condition. This study aims to identify the industries and exposure agents of patients seen at the dermatology clinic at the NIOH. The study will identify the gaps in having the process of having a claim successfully settled and help to improve the service to patients at the dermatology clinic. The findings should be of general importance in documenting the causes of OCD in the region and in evaluating the compensation system for OCD patients.

1.4 Literature review

1.4.1 Occupational contact dermatitis and other skin diseases

Dermatitis and eczema are used interchangeably to describe inflammatory changes in the skin. Dermatitis can be due to either endogenous or exogenous factors.[6] The two most important types of occupational contact dermatitis (OCD) are irritant contact dermatitis (ICD) and allergic contact dermatitis (ACD).[7] Irritant contact dermatitis may be acute or chronic.[8] In ICD the skin barrier is damaged and irritants cause an inflammatory reaction.[7, 9] Allergic contact dermatitis is a consequence of a delayed hypersensitivity reaction to an allergen.[9]

There are many other skin diseases that may be vocationally related and these include: photosensitivity dermatitis, acne, pigment disorders, uticaria, neoplastic disease, vascular disease, granulomatous reactions, hair and nail disorders, infections of the skin and physical

trauma.[10] This study has focused on OCD rather than other occupationally related skin diseases.

1.4.2 Diagnosis

The diagnosis of OCD depends on the nature of the rash, occupational exposure, anatomical distribution, improvement of the rash when not at work and the results of special investigations such as skin patch tests.[6,7,11] A high index of suspicion is required for the diagnosis of OCD especially if there is no history of skin rashes in the workplace.[12] In OCD the rash tends to improve when the worker is not at work e.g. when on leave.[13] If there is no improvement in the rash after three weeks of absence from work then an endogenous cause for the rash needs to be considered or non occupational contact dermatits.[12,13]

The onset of ICD can be immediate and does not require a sensitisation period.[8] ACD may occur as early as within two weeks of exposure to the agent but the latency period may be months to years.[6,9] Both types of dermatitis typically occur within one year of exposure to the agent.[13] The rash may be due to more than one agent.[14]

The diagnosis of OCD can be difficult if there is an underlying endogenous cause like eczema for the rash. OCD should only be considered if there is a definitive occupational exposure.[13] The skin patch test (SPT) is useful for confirming the diagnosis of ACD is an objective way of diagnosing ACD.[15] A negative patch test does not negate the diagnosis of ACD as the agent responsible for the dermatitis may not be part of the skin patch test series used to test the patient. [15]

The clinical features of contact dermatitis include pruritus, erythema, scaling, vesiculation and clustered papulovesicles. In chronic cases, fissures, hyperkeratosis and lichenification occur.[16-18]

1.4.3 Incidence and prevalence

It is accepted that occupational skin diseases are underreported.[19] This paucity of data makes it difficult to quantify the prevalence and incidence of this occupational disease.[11,19] This has lead to it being dubbed the "hidden epidemic."[20] Belsito quoted the prevalence in Europe as ranging from 6.7% to 10.6%.[11] In the state of Oregon in the United States of America it was found that the prevalence of occupational skin diseases was in the region of 15%.[21] In Australia the incidence is estimated at between 50-190 new cases per 100 000 of the working population.[7,9] In Denmark the incidence was estimated as 0.8 per 1 000 per year of the working population.[7] In the United Kingdom the incidence of occupational skin disease is estimated at 13 workers per 100 000 per year of the working population with a prevalence of 15 workers per 100 000.[22]

The prevalence varies according to occupation and industry and this further complicates estimating the population prevalence. A study by Attwa found that motor mechanics had a higher prevalence (18.4%) of OCD than controls (3.9%). The controls were in a low risk exposure group (book sellers.)[23] The nature of the job is an important predictor of OCD. Other high risk occupations include health care workers, metal workers, hairdressers, florists, bakers and concreters and bricklayers.[7,9,17,21] McCall *et al*, estimated the burden of OCD in different industries by using compensation claims submitted by these industries as a

proxy.[21] High claim rates (per 100 000 workers) were seen in the following industries: forestry and fisheries (64.5), agriculture (13), manufacture (9.3), construction (7.1), hospitals (8.1) and medical services (excluding hospitals) (7.7.) The claim rates were low in the following industries: educational services (1.8), finance/insurance/real estate (0.8) and transportation (2.3.)[21]

1.4.4 Rates of OCD among all occupational diseases

Skin diseases rank as one of the top causes of occupational diseases. In Germany between 1990 and 1993 occupational skin disease (OSD) comprised 34% of all occupational diseases.[7] In Singapore (2001-2002) it was the second most common (20%) of all occupational diseases.[24] In South Africa, Jeebhay and Jacobs (1990) reported that OCD was the third commonest occupational disease (12%) outside of the mining industry and the second most common within the mining industry.[25] Carman and Kruger (2008) reported that OCD is the most common of all occupational skin diseases South Africa.[26] In many countries it is seen as the most important occupational disease and it constitutes up to 30% of all occupational diseases that were compensated.[27] London, *et al* (1992) concluded from a study done in the canning industry that there was an under reporting of OCD and that the burden of disease was underestimated in South Africa when compared to international figures.[28]

1.4.5 Determinants of OCD

Skin contact with allergens or irritants or both is a necessary cause for OCD. The severity of the reaction depends on the type and duration of the exposure.[11] Endogenous factors (individual) and exogenous (exposure) factors determine the probability and severity of an

occupational dermatosis.[8,11] The endogenous factors include age, sex, ethnicity, anatomical site of contact, history of eczema and atopy.[8,27,29] The exogenous factors depend on the work environment, the nature of the work done and the agents the worker is exposed to.[11]

1.4.5.1 Endogenous factors

Age

The literature suggests that there is an inverse relationship between age and susceptibility to irritation.[29,30] In childhood, it appears that ICD decreases with increasing age.[31] In the elderly (>60 years) there was a decreased response to irritants.[30] Cumulative exposures in younger adults may result in greater reactivity. [31]

Sex

There are conflicting views about the difference in the susceptibility of men versus women to develop an occupationally related dermatitis.[32] Some studies have shown that women are more susceptible to developing ICD.[8,11] However, this may not be due to inherent sex differences but rather due to the occupational and non occupational exposures of women.[33] Women are more likely to be exposed to common sensitising agents like nickel because it commonly occurs in jewelry.[34,35]

Ethnicity

There is controversy regarding ethnic differences in developing contact dermatitis. One study reported more severe allergic reactions in Japanese people than in Caucasians.[36] In a limited number of studies, African-Americans were shown to have lower levels of

sensitisation The postulation for this is that the stratum corneum of African-Americans has a higher lipid content.[37] Goh (1986) found no difference in the incidence of ACD among the indigenous people (Malay, Chinese and Indian) of Singapore.[35] The research in this area is very sparse but suggests that there are no inherent race-related factors that influence the development of contact dermatitis.

Anatomical site

Skin in different parts of the body has different permeability and thus reacts differently to irritants.[37] The skin is most permeable on the face and least so on the back. The hands are however, the most frequently exposed to either irritants or allergens and OCD is most commonly seen on the hands.[38,39]

History of eczema and atopy

The literature mentions that a history of eczema and atopy are important considerations in the development of contact dermatitis.[38] Coenraads and Diepgen (1998) concluded that individuals with a history of atopy are more at risk of developing ICD when exposed to occupational agents.[39] However, there is no consistently used definition of atopy. Some authors include a family and personal history of atopy while others divide patients into those with a history of atopic eczema and respiratory allergy. Another group of authors only considers a positive skin prick test as an indication of atopic diathesis.[40]

Atopic individuals have a predisposition to developing atopic eczema, allergic rhinitis or allergic asthma.[7] A positive family history of atopy increases the risk of developing allergic dermatitis with increasing risk dependent on the number of relatives affected.[38] It is

however, difficult to ascribe only genetic factors to this association because families share a common environment.[38]

A history of atopy also influences the prognosis of OCD. Holness and Nethercott (1990) found that workers with atopic dermatitis and OCD were less likely to improve than workers with OCD only.[41] These individuals often have persistent dermatitis even if they change jobs.[41]

1.4.5.2 Exogenous factors

Work environment

Work environmental factors aggravating and predisposing to OCD include heat, cold, humidity and UV radiation.[8,42] Wet conditions are often more problematic than cold conditions.[42] "Wet work" causes maceration of the skin resulting in fissuring and scaling and increased risk of irritants and allergens penetrating the skin.[43] Increased sweating will create a wet environment which can destroy the epidermal barrier.[8] Humidity and heat can result in solubilising of chemicals which aids their absorption.[43]

Mechanical factors such as friction, occlusion, pressure and vibration can result in repeated micro trauma which disrupts the epidermal barrier and increases susceptibility of the host to irritants and allergens.[43,44] Friction may be as a result of the type of job being done, the materials being handled, the tools used or the protective equipment and clothing used in performing the job.[44] Equipment and clothing meant to protect the worker may cause or aggravate OCD.

Developing OCD is also dependent on the job being done and certain occupations are at higher risk than others. Commonly affected groups include mechanics, housekeepers, metalworkers, cleaners, health care workers, construction workers, hairdressers, beauticians, cooks, bakers, agricultural workers and labourers.[7,8,11,24] This list is by no means exhaustive.

Exposure agents

Almost any chemical has the potential to be an irritant or an allergen. Allergens are usually organic in nature and provoke a cell mediated immune response. Irritants cause an inflammatory reaction. The potential irritancy depends on the molecular size, the volume of exposure, the duration of exposure and the solubility of the agent.[8,37] These considerations determine the outcome of the dermatosis.[8] The resultant dermatosis may be due to exposure to more than one agent (polysensitisation.)[14] Polysensitisation increases the susceptibility of the participant to develop a contact dermatosis.[45] The relationship between multiple exposures and developing OCD is complex.[14] Multiple exposures in the workplace however predisposes to an increased risk of developing OCD and increased severity of the disease.[45]

In Figure 1.1 below (produced from various sources) the common irritants and allergens are tabulated against the occupations they commonly occur in.[9,46-49] This list is not exhaustive but it does represent the most common high risk occupations and the most common allergens and irritants in these occupations.

Nickel is a common allergen frequently found in commercial products and in the work place.[50] Nickel is frequently found as a component alloy in stainless steel, silver, chrome plating and 14-carat gold.[34] Sweat dissolves nickel out of the metal and this can result in sensitisation to the nickel.[34] Workers at risk of developing nickel sensitisation include platers, metal workers, tool makers, car mechanics and cleaners and anyone working with tools containing nickel.[50,51] Although nickel is common in the workplace, nickel allergy is usually not occupationally related as it is found in everyday personal objects like costume jewellery, spectacle frames, buttons and coins.[50] Nickel frequently tests positive on skin patch testing but this does not necessarily mean that it is occupationally related. [52]

List of allergens and irritants encountered in various occupations

Occupation	Allergens	Irritants
Agriculture and farming	Rubber, plants, cereal crops, animal feed, veterinary medication, pesticides, wood, wool, preservatives	Artificial fertilisers, pesticides, insecticides, disinfectants, cleaning agents, petrol, diesel, oil
Cleaners	Rubber gloves, polishes, fragrances, disinfectants, waxes	Detergents, water, soaps, solvents, oils, greases
Construction workers	Cement, epoxy resins, woods, paints, varnishes, nickel, rubber, leather	Cement, wood dust, preservatives, fibreglass, solvents, pitch, tar, paint
Electronics and electric workers	Resins, soldering flux, metals, gloves, rubber	Solvents, soldering flux, acids, alkalis, resins, fibreglass, metallic salts
Food and catering industry	Flavourants, essential oils, dyes, foods, gloves, ant-oxidants, preservatives, utensils, nickel	Vegetables, fruit juices, lactic acid, enzymes, acetic acid, water, emulsifying agents
Foundry workers	Phenol and urea formaldehyde, resins, colophony, epoxy resins, cement, gloves	Oils, phenols, skin cleaners
Health care workers	Anaesthetics, antibiotics, antiseptics, formaldehyde, gluteraldehyde, rubber gloves, preservatives, acrylate	Detergents, disinfectants, water, soap, skin cleaners, alcohol
Hairdressers	Hair dyes, persulphate, nickel, fragrances, rubber gloves, formaldehyde, nickel, resorcinol	Shampoos, bleaching agents, water
Mechanics	Rubber, soldering flux, epoxy resins, additives in fuel	Solvents, fuels, grease, oils, detergents, abrasive soaps
Metal workers	Nickel, chromate, additives in cutting oils	Cutting oils, solvents, hand cleaners

Figure 1.1 List of allergens and irritants in selected occupations

1.4.6 Psychosocial, financial and occupational impact

Skin conditions are rarely life threatening but do affect the quality of life of individuals and their families.[53] The impact of OCD is experienced on a psychosocial, financial and occupational level. Although distinct categories can be drawn, there is overlap in these domains and the impact of OCD on a person's life cannot be viewed in isolation. [54]

Psychosocial impact

Skin disease can precipitate or exacerbate psychological stress or lead to secondary mood disorders such as depression and anxiety.[54] Individuals with chronic skin disease often feel self-conscious, helpless, embarrassed, and frustrated and angry.[55,56]

The impact of skin disease can be devastating on the social lives of people. The visibility of the disease means that people experience embarrassment and social withdrawal.[55] This, coupled with misunderstanding of skin disease and public fear of infection, increases social isolation.[57] This can be very debilitating as patients avoid social setting for fear of rejection.[54] In a 2006 study by Maroti *et al*, the majority of female participants with a skin disease did not want to appear in public because they felt ugly.[58]

Interpersonal relationships are also affected as a consequence of chronic skin diseases.[54] In 2007 Basra and Finlay found that 8% of participants reported that their sex life was adversely affected due to their skin condition. In the same study, participants reported that their outdoor leisure activities such as swimming, going to the beach and enjoying other outdoor activities like hiking, were hindered by their self consciousness of their skin condition. Basra and Finlay further reported that at least 98% of family members of participants interviewed (50 family members) were affected by the family member's skin disease.[59] In a 2006 study in Israel, Lazarov *et al*, found that of the 70 workers interviewed, 46% indicated that their OCD affected their interpersonal relationships; 19% said it affected their relationship within their family and 46% indicated that it affected their activities of daily living.[60]

Financial impact

The financial impact on individuals is direct and indirect.[61] Direct expenses are incurred as a result of out of pocket expenses for medical treatment. In a British community based study Herd *et al*, (1996) reported that the annual personal expense for atopic eczema was £297.[62] People may also loose income as a result of unemployment. This may be the consequence of either voluntary or involuntary dismissal.[61] Indirect expenses are a consequence of lost working days and travel expenses.[61] Financial losses are also incurred as a result of disability and inadequate compensation payments.[5,60] This in turn affects the macro economics of a country. Absenteeism results in a loss of production and decreased revenue returns for the government.[61]

Occupational impact

In the workplace occupational morbidity is defined in terms of impairment, disability and handicap. Impairment refers to any loss or abnormality of psychological, physiological or anatomical structure or function. Disability is any restriction or lack of ability (from impairment) to perform an activity in a manner considered normal. Handicap is a disadvantage that limits or prevents the fulfilment of a role that is normal.[61,63] The main aim of treating occupational skin disease is to reduce impairment and disability. Handicap is poorly described in occupational skin disease.[61]

The impact in the work environment is as a consequence of absenteeism and presenteeism.[61] Absenteeism and presenteeism contribute to the indirect cost and overall economic burden of skin disease.[54] Hutchings *et al*, reported that OCD did not prevent work but it affected work.[64] In this study workers reported that their work was limited because

they spent less time on tasks, were less careful about performing tasks and or were limited in the scope of work they could do.[56,64]

OCD may result in redeployment in the workplace.[63] This may involve re-skilling of the worker which has financial implications.[61] Redeployment and removal from the irritant or allergen is, however, no guarantee that the dermatitis will improve and resolve.[64,65] Workers may thus choose to voluntarily leave their employment.[63] However, some workers will continue to remain in the same job because of lack of other employment opportunities.[63] In Lazarov's study 70 workers in total were interviewed and 28 (40%) had stopped working in their profession due to OCD; 20 (28.6%) resigned because their skin condition got worse and eight (11.4%) were dismissed. [60]

1.4.7 Prognosis of OCD

The prognosis of OCD takes into consideration degree of healing, impact on the quality of life, on employment and the cost to the individual and the broader community.[66] This variability makes it difficult to quantify the impact of OCD among individuals and occupational settings and how endogenous and exogenous factors impact on the prognosis of OCD.[67] Factors that improve the prognosis of OCD include early diagnosis and increased patient awareness of the condition.[68] Removal from the job does not always result in resolution of OCD. The literature states that 21- 35% of workers who changed jobs still have persistent post occupational dermatitis.[67] In general, the prognosis of OCD is poor and this makes prevention and early diagnosis imperative.[68] Adequate and speedy compensation

would support removal from exposure and is hence an important control measure in dealing with OCD.[69]

1.4.8 Prevention of OCD

The first line of prevention of OCD is to identify the allergen and/or irritant and establish if it can be eliminated or if this not possible, substitute it with less a hazardous agent.[69] The next level of control is to develop engineering controls to eliminate or decrease exposure to these agents.[69] The introduction of personal protective equipment (PPE) such as gloves and special clothing should be the last resort to control exposure to the agents.[69] Workers need to be educated on appropriate and consistent utilisation of PPE.[70] The responsibility of ensuring a safe work environment is the dual responsibility of the worker and the employer.[71]

The effectiveness of a multidisciplinary approach to prevent occupational skin diseases is described in 2008 by John in the Osnabrück model.[72] This model describes strategies for primary, secondary and tertiary prevention of occupational skin disease. The model included outpatient evaluation, intense patient education and psychological counselling.

The focus of primary prevention is to stop OCD by eliminating or reducing exposure. This includes advising and educating individuals on protecting themselves in the workplace. It also entails pre-employment testing to known allergens and irritants in specific occupations and advising susceptible individuals to pursue alternate occupations.[73] Proactive surveillance of OCD is an important consideration in specific occupational settings.[74]

Secondary prevention entails prevention of worsening of the existing OCD. This requires clinical assessment and treatment and psychological support.[72,75] The diagnosis of OCD can be difficult and it is important to have a physician or dermatologist trained in this field to confirm the diagnosis.[13] Secondary prevention also entails increasing awareness in workers so that they can report a rash timeously.[73]

Severe occupational skin disease may interfere with continuation of the occupation. This incurs costs due to rehabilitation, re-skilling and compensation.[73] The Osnabrück model describes tertiary individual prevention (TIP) as a mechanism to preserve patients' jobs who are at risk of losing them and to rehabilitate individuals where secondary prevention has failed.[72] A ten year follow up study by Skudlik *et al*, in 2008 subsequent to the initiation of the Osnabrück model, showed that TIP made a significant difference in the lives and occupation of individuals that were part of this programme.[76]

1.4.9 Compensation

The compensation system is one of the oldest forms of social insurance world wide.[77] South Africa has adopted a no blame compensation system, under which the employee cannot litigate against the employer for an occupational injury or disease. The employer contributes to a central fund and claims for occupational compensation are settled from this fund. In South Africa compensation legislation for OCD is administered under the Compensation for Occupational Injuries and Diseases Act (COID Act) (amended) no, 61 of 1997 which is administered for the Department of Labour (DoL) by the Compensation Commissioner who is appointed by the Director-General of the DoL. The COID Act makes provision for "the

payment of compensation, the cost of medical aid or other pecuniary benefits to or on behalf of or in respect of employees in terms of this Act where no other person is liable for such payment" (COID Act 61, 1997, 16 (1) (a).[4]

Section 66 of the COID Act states that if a disease listed in Schedule 3 of the Act is diagnosed in an employee then this disease should be presumed to be as a consequence of the employee's occupation, unless proven otherwise. It is the responsibility of the employee to alert the employer in writing as soon as an occupational disease has been diagnosed (section 68 (1)). It is then the responsibility of the employer to notify the Commissioner's office within 14 days of having received the notice (section 68 (2).) If the employer fails to do so, the employer will then be guilty of an offence (section 68 (3).) Section 99 makes provision for an offender of the Act to be liable for a fine or imprisonment not exceeding one year.[4]

Section 73 of COID Act clearly states that the employee should not bear the cost of medical expenses incurred as a result of an occupational disease. The Commissioner or the employer should take financial responsibility for any disease listed in schedule 3 of the Act. "Allergic or irritant dermatitis due to dust, liquids or other external agents or factors" is listed in schedule 3 of the Act as an occupational disease.[4]

The process of compensation for OCD starts with the employee reporting the condition to a health care provider. Once the diagnosis of OCD is made, the case has to be reported to the Commissioner's office within 14 days. A series of appropriate forms is completed and submitted to the Commissioner's office. These forms are described below in Table 1.1. The

Commissioner requires all the necessary forms to be completed in order to settle a claim. The Commissioner reviews the claim and either decides that the dermatitis is related to the claimant's occupation or not. If the Commissioner decides that the dermatitis is related to the claimant's occupation then the employee is paid an amount according to the degree of permanent disability. This is an inherent problem with the COID Act. The payment is based on impairment but termed "disablement" by the Commissioner. The Commissioner has a sliding scale to decide on the amount to be compensated.[4]

Table 1.1 The documents required by the Commissioner when submitting a case for OCD

Document type	Description of the document
W.CL. 1	Employer's report of an occupational disease
W.CL. 14	Notice of an occupational disease and claim for compensation
W.CL. 22	First medical report in respect of an occupational disease
W.CL. 26	Final or progress medical report in respect of an occupational disease
Dermatology report	Report from a dermatologist to confirm that the disease is a dermatitis related to vocation
W.CL. 10	Exposure history
Results of special investigations	Skin patch testing is a special investigation used by the Commissioner in adjudicating a claim, if appropriate
National identity document	
Salary advice slip	Salary of the claimant at the time the claim was lodged

The literature states that workers' experience with the compensation process is not always favourable. In 2001, Dembe reported that workers generally have a negative experience

with workers' compensation systems and perceive them as "uncaring, unfair and adversarial."[77] Workers often report that they do not receive adequate support from employers and see this as an obstacle to gaining compensation benefits.[78]

There is a paucity of recent literature on the outcomes of compensation claims from the Commissioner's office in South Africa. The 2002 Taylor Report stated that the Commissioner's office had failed to pay out adequate compensation to workers.[5] There are several media reports on how poor the Commissioner is in settling claims. In 2006, the trade union Solidarity issued a statement that the Commissioner's office was in a crisis as it could not process and settle claims on time. Solidarity reported that it had members who submitted claims (all occupational diseases and injuries) in 2002 and they were still not settled by 2006 when they had issued the press release.[79] In the 2007/2008 Annual Report of the Compensation Fund, the Commissioner stated that the fund faced several challenges that impeded service delivery. These challenges included poor management of the fund in the past; inadequate human resource capacity (especially in middle and senior tiers); poor governance procedures and poorly functioning information technology systems.[80]

1.4.10 Public health importance

OCD has important public health ramifications because it is a common occupational disease; it generally has a poor prognosis; and has a significant psychosocial and financial impact on individuals.[81] OCD impact on individual finances, and affects productivity and can have a detrimental impact on the macro economy of a country. Compensation payments impact on the financial resources of individuals.[21,61] Compensation levies to the Fund reduce available

finance at the enterprise level. OCD is, however, amenable to public health interventions: primary, secondary and tertiary prevention can alter the epidemiology of OCD.[73]

In the 2008 report by the Commission on Social Determinants of Health, the chair of the Commission, Michael Marmot stated that poverty still remained a major driving force for health inequality. The report stated that "achieving health equity requires safe, secure, and fairly paid work, year round work opportunities, and healthy work-life balance for all."[82] This report furthermore, stated that all workers have the right to working conditions that reduce their risk of exposure to hazardous material, work related stress, and health damaging behaviour. [82]

South Africa needs to eradicate poverty and improve equity between the rich and the poor in order to achieve its mandate of achieving the Millennium Development Goals (MDGs).[83] A healthy workforce is essential to realising this mandate. South Africa has some of the most progressive policies in the world, not least of which is its compensation legislation. It is imperative that these policies are enforced to ensure that inequity is addressed.[83]

1.4.11 Aims and objectives

Aims:

1. To describe the cases seen at the occupational dermatology clinic at the National Institute for Occupational Health (NIOH).
2. To describe the industries and exposure agents of cases diagnosed with occupational contact dermatitis (OCD).
3. To describe the psychosocial, financial and occupational impact and compensation outcomes of cases diagnosed with OCD.

Objectives:

1. To describe the age, sex, diagnosis, site of dermatosis and skin patch test results of cases seen at the occupational dermatology clinic from August 2005 to December 2007.
2. To describe the jobs, industries and suspected exposure agents of cases with OCD and dermatoses not related to vocation.
3. To determine the duration of exposure to a suspected agent before a diagnosis was made.
4. To describe the psychosocial, financial and occupational impact of the skin conditions.
5. To describe compensation outcomes including claim status and outstanding documentation, the experience of claimants with the Commissioner's office, and the delay from submission to resolution.

Chapter 2 Methodology

In this chapter the methodology of the study will be presented. The following will be described: study design; pilot study; study population; collection of data; data management; data analysis and ethical considerations.

2.1 Study design

This was a cross sectional study using quantitative and qualitative methods. The study consisted of three components. The first component was a retrospective review of medical records of all patients seen at the dermatology clinic at the National Institute for Occupational Health (NIOH) between August 2005 and December 2007. The second component was a semi-structured telephone interview administered to patients seen at the dermatology clinic. The interviews were done by the principal investigator. The third component was a follow up of all cases that were submitted for compensation in terms of the Compensation for Occupational Injuries and Disease Act (COID Act.) The Commissioner's office (the Commissioner of the Compensation Fund) was visited by the principal investigator on two occasions.

2.2 Pilot

The telephone questionnaire was piloted for clarity of questions on a group of five public health registrars. The questionnaire was administered to this group in a telephone interview. Responses to the questionnaire were noted. No changes were made to the questionnaire.

2.3 Study site

The medical records of the patients were kept at the dermatology clinic at the National Institute for Occupational Health (NIOH.) The NIOH is located in Johannesburg and sees cases from across the country but mainly from Gauteng. The referral base includes a wide variety of industries that have developed a rapport with the clinic as well as self referrals and referrals by word of mouth. The clinic operated once a month on a Friday afternoon. The clinic was run by a medical scientist (immunologist) and a specialist dermatologist with an interest in occupational skin diseases. The medical scientist was experienced in skin patch testing (SPT) and skin prick testing and had experience in working in various industries and with agents causing work associated skin diseases. There has only been one part time dermatologist at the clinic since its inception.

2.4 Study population

The occupational dermatology clinic was established in August 2005. All patients seen at the clinic in the period August 2005 to December 2007 were included in the study. The total number of patients seen at the clinic over the study period was 129. No sampling was done. The records of all patients seen at the clinic, regardless of diagnosis, were included in the analysis except that one 13 year old boy was excluded on grounds that he was a scholar and his reason for consultation at the clinic was not related to occupation.

The dermatologist diagnosed a patient as having OCD based on the history, occupational exposure and the results of the skin patch tests. Patients were coded as either having

OCD (n=64) or as not having OCD case because the skin condition was not related to their occupation (n=64.)

2.5 Data collection

The data were collected in three stages. The quality of the data was controlled by the researcher by checking the collection sheets and referring back to patient records to clarify any discrepancies. A data coding sheet was used to capture data from the medical records at the clinic (Appendix A). An information sheet and questionnaire were developed for the telephone interview (Appendices B and C) and a data coding sheet was used to gather data from the Commissioner (Appendix D).

2.5.1 Patient record review

All patient records for the study period (01 August 2005 and 31 December 2007) were retrieved. The dermatology clinic has a dedicated filing system. All the files of patient records are kept in the clinic and are easily retrieved. The relevant information was extracted from these records and recorded on the data capture sheets (Appendix A) by the principal researcher. The records contain the clinical notes made during the examination, a comprehensive history of the skin condition and the results of the skin patch test. The skin patch test is done at the time of consultation and reviewed at the follow up visit.

Information collected from the patients' records included:

- Age
- Sex
- Job at the time when the rash developed
- Industry at the time when the rash developed
- Site of rash
- Duration of exposure to suspected agents
- Duration from when the rash appeared to time of diagnosis
- Other co-workers affected
- Skin patch tests done
- Results of skin patch test

2.5.2 Telephone interviews

Telephone interviews were conducted with all patients regardless of their final diagnosis. An attempt was made to contact all 128 patients for whom records were available. Of these, 94 were contactable giving a response rate of 74.4%. One interview was excluded from the analysis because the participant opted not to have his data included at the end of the interview. Figure 2.1 illustrates the distribution of the participants in the telephone interview.

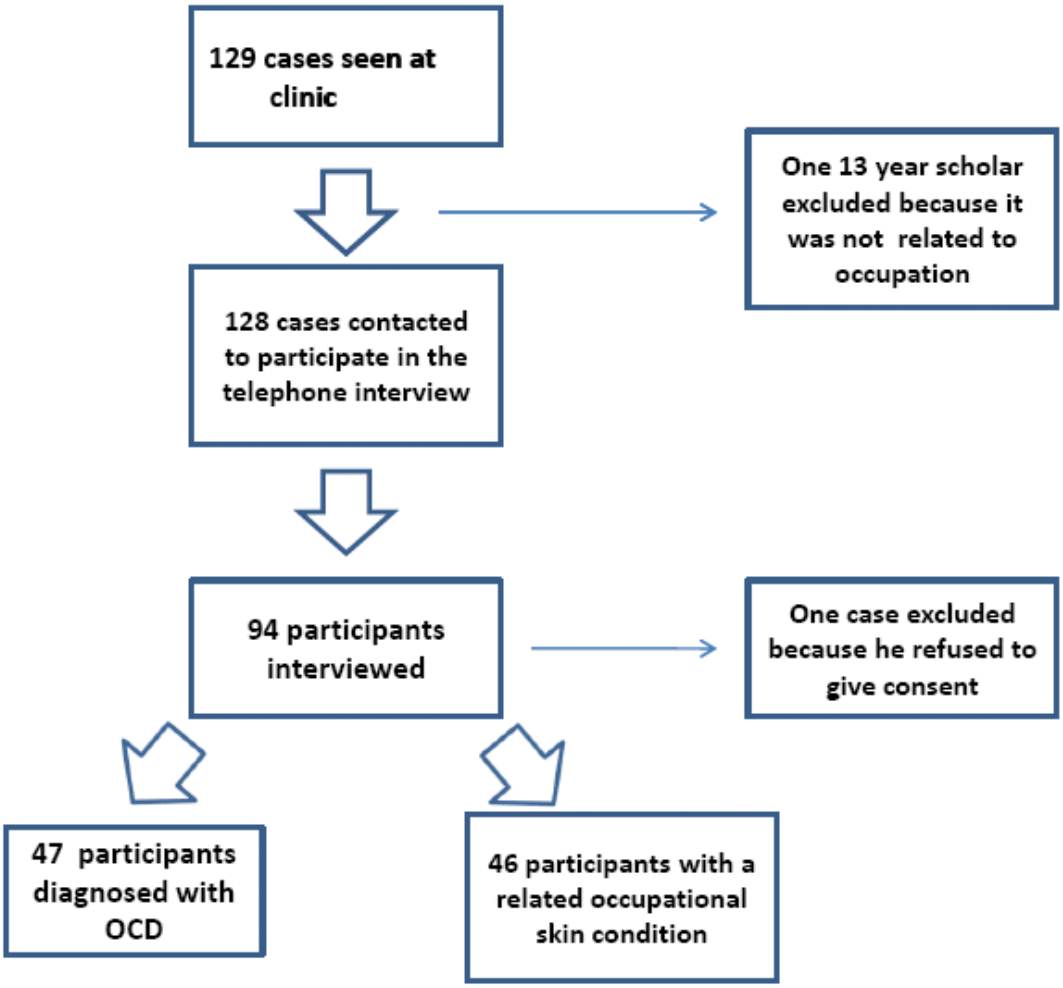

Figure 2.1 Break down of how participants for the telephone interview originated

The participants were contacted using the contact details in their medical records. If a participant was not contactable because their telephone numbers had changed the employer was contacted. If the participant had changed employment the next of kin was contacted. (The patients were asked to provide next of kin contact details when they first came to the clinic.) If the next of kin was not contactable or did not have a number for the participant, then Telkom directory enquires was contacted.

Telephone calls were made during office hours and after hours to allow for times that participants were not at work. In some instances the employer consented to the employee completing the interview during work hours. If the telephone number was valid but the participant was not available to complete the interview, three attempts were made to contact the participant. These attempts were made at different times of the day and after hours to try and contact the person at a time that they were likely to be at home or at work. After three attempts the participant was considered not contactable. Where appropriate a message was also left for the participant to return the call. In these instances where the participant did return the call the participant was called back so that it was not at their expense.

The telephone interviews were conducted in English or Afrikaans. If the participant could not speak either of these languages then the interview was done via a translator. In the instances where a translator was needed the interviewer used a member of staff at the NIOH that could speak the preferred language of the participant. The NIOH staff member was trained to administer the questionnaire. The interview took 15-20 minutes to complete.

The purpose of the study was explained to the participants and verbal consent was obtained from them. They were given the option not to participate or to opt out at any stage of the interview. They were given the contact details of the researcher at the NIOH and the occupational dermatology clinic. The questionnaire that was administered telephonically is attached as Appendix D. Participants were asked closed- and open-

ended questions. The interviewer probed the responses of the open-ended questions and these were captured.

In the closed-ended questions the participants were asked:

- if they were still working for the same employer
- if they were still exposed to the same suspected agents that caused the dermatosis
- if they changed jobs within the organisation or changed to another employer as a result of the dermatosis
- if the change of employer was related to their dermatosis
- If they experienced loss of income or promotional opportunities at work due to their dermatosis
- to quantify their loss of income in rands and the period over which this loss was sustained in months
- to quantify any out of pocket payments for medical care related to their dermatosis in rands and the duration of this payment in months
- if the dermatosis affected their work performance according to a Likert scale
- If they were aware of a claim submitted for compensation and if the Commissioner had contacted them regarding this claim

In the open-ended questions the participants were asked about how the contact dermatitis had impacted on their lives socially and occupationally. The researcher probed the participants' responses to better understand the participants' perspectives.

The cases diagnosed with occupational contact dermatitis were also asked about their experience with the Commissioner's office. They were asked to comment on the service the Commissioner's office rendered in terms of dealing with their claim. They were asked to comment on whether the Commissioner's office contacted them about their claim; how enquires about the progress of their claim were handled and if they felt the claim was handled in good time.

2.5.3 Review of claims submitted to the Commissioner and the status of the claims

All participants who had a diagnosis of occupational contact dermatitis (OCD) were included in the third part of the study. After a patient was seen at the skin clinic a report of the diagnosis and findings was sent to the employer. In the case of a diagnosis of OCD the necessary documentation was faxed to the Commissioner's office and to the employer. The employer is ultimately responsible for following up cases with the Commissioner.

The records of participants' diagnosed with OCD were reviewed to determine the status of their claim. All records were reviewed to verify if:

1. there was a record of confirmation of a fax sent to the employer and to the Commissioner's office
2. the status of the claim was known. This was ascertained in two ways. First, the Department of Labour (DoL) website was checked to see if a claim had been

registered. This was done using the patient's national identity number. The national identity number was obtained from patient records. (Patients were asked for this number at their first visit and a copy was made of the identity book at the first or subsequent visit and stored in the patients' files.)

Secondly, the researcher visited the Commissioner's office in Pretoria twice to collect data on each claim submitted by the NIOH against the electronic records of the Commissioner. The researcher was assisted in this task by a claimant officer at the Commissioner's office. The aim of these visits was to determine if a claim was registered with the Commissioner; the progress of the claim; the reasons why some claims were not settled; and the time from the submission of the claim to the time of the visit to the Commissioner's office. This information was captured on a data capture sheet (Appendix D).

The Commissioner received hard copies of claims. These claims were either faxed, posted or hand delivered to the Commissioner. This information was then captured electronically. The claims were then reviewed by clerks at the Commissioner. These clerks had a checklist of documents required for each claim. If a claim did not have all the required documents the claimant or employer was not informed routinely of the outstanding documentation. The Commissioner's office expected the claimant or the employer to follow up to check that all documentation had been received. Claims that complied with the regulations were then referred to either a review panel of nurses or doctors to decide if the claimant qualified for compensation.

Following the visit to the Commissioner's office, the researcher re-checked the patients' medical records to verify whether the outstanding documents the Commissioner's office reported correlated with the fax records in the patients' records. The NIOH keeps a record of faxes sent to the employer and the Commissioner. The employer was also contacted to ascertain if they had submitted the required forms (WC L1) to the Commissioner's office.

2.6 Data management

Each patient was assigned a unique study number to ensure anonymity. The unique number was recorded on each data capture sheet. These unique study numbers were allocated for individual clinical records. This list was kept in a safe place at the dermatology clinic at the NIOH and only the researcher had access to this list.

Data were recorded on data collection sheets which were designed in Microsoft Word 2007. The data were coded and the code was captured on Microsoft Access 2007. The coded data were captured twice from the hard copies of the data capture sheets. One data set was captured by the researcher and the second set was captured by an independent data capturer. The two data bases were then compared in Microsoft Access to check for consistency. Inconsistencies were cross checked and corrected by referring back to the original data capture sheets and the patient clinic records. This third corrected data base was then analysed. The verified coded data were analysed using STATA 10. In Table 2.1 below the variables are tabulated against the objectives of the study.

Table 2.1 The objectives of the study and the variables analysed to meet these objectives

Objective	Variables	
• To describe the cases seen at the skin clinic	• Age • Sex • Diagnosis	• Site of dermatosis • Skin patch test result
• To describe and compare the jobs, the industries and agents cases were exposed to at the time of onset of the rash	• Job/occupation at time of diagnosis • Industries worked in at time of diagnosis	• Suspected agents at time of diagnosis
• To determine the duration of exposure to an agent before the diagnosis was made	• Duration of exposure to a suspected agent in the workplace	
• To determine the duration from the onset of the rash to the time of diagnosis	• Duration from onset of rash to diagnosis	
• To determine the psychosocial, economic and occupational impact of OCD	• Current employer • Current exposure to suspected agents causing dermatosis • The reason and outcome for changing employment • Out of pocket payments for dermatosis	• Loss of income due to dermatosis • Loss of promotion opportunities due to dermatosis • Impact on performance at work
• To describe the compensation outcomes of cases diagnosed with OCD	• Claim status • Outstanding documentation	• The time delay between submission of a claim and settlement of claim or visit to the Commissioner

2.6.1. Description of cases seen at the skin clinic

Age, sex, site of dermatosis, diagnosis and skin patch test results were described. Age was analysed as a continuous variable.

2.6.2 Agents

The cases were exposed to a variety of agents which are captured in detail but for analysis these agents were categorised into broad categories namely: chemicals; oils and greases; epoxy resins; water and humidity; detergents; rubber and latex; metals; nickel; unidentified agents. (Nickel is mentioned separately because it is a common allergen but it is not always vocationally related. Organic solvents are a leading cause of irritant contact dermatitis but were included in the category chemicals because the absolute number was very low.) Agents that did not fit specifically into any of these categories were classified as “other.” This category included agents such as heat, leather, wool, alcohol, fragrances, flavourings and biological agents like fungi and bacteria.

For the purpose of the multivariate analysis the agents had to be further collapsed because of the small number of participants. These categories were chemicals, metals, agent not known and other. Oils and greases; detergents and epoxy resins were reclassified as chemicals. Nickel and other metals were grouped together because of the small numbers in each category. Water and humidity and latex and rubber were included in the “other” category. Chemicals were used as the reference group in the multivariate analysis.

2.6.3 Job classification

The jobs done by the participants with and without OCD were captured in detail but for multivariate analysis the jobs were classified into three broad categories namely unskilled, skilled and professionals. This classification was used as a proxy for level of education. It was assumed that unskilled workers would have lower levels of schooling and that professionals would have a tertiary level of education. This classification was conducted to see if likely education levels made a difference in compensation outcomes. It was assumed that participants with higher levels of education would be more empowered to follow up their compensation claims.

Workers were classified as unskilled if no formal training was needed for the job they did. These were mainly manual labourers and included cleaners, fettlers and workers in mines not trained for a specific job.

Skilled workers were those who had acquired a skill either through a specific training programme or had a formal education for the skill. These included spray painters, mechanics, miners and hairdressers.

Professionals were defined as participants who had formal training (usually at a tertiary institution) and were registered with a professional body. This included laboratory technicians, nurses, doctors and engineers.

2.6.4 Industries

The industries were classified according to the size of the industry. They were classified as micro if 10 or fewer people were employed; small if 11-100 were employed and large industries employed more than 100 employees. The information on the number of employees was obtained from the occupational health or human resource departments at the various industries that referred cases to the NIOH.

The industries were also classified according to the nature of the industry. These categories were based on the classification used at the occupational dermatology clinic. The categories used were engineering, mining, manufacture, health care, motor, food, refineries and "other." The "other" category was created where there were too few cases to be classified separately. These industries included the construction, milling, textile and beauty and cosmetic industries.

2.6.5 Duration of exposure to the suspected agent

The duration of exposure to a suspected agent was taken as the time in months from when the patient reported they had first worked with the suspected agent to the time they developed a rash. The agent was not always known. The time it took for the dermatosis to develop varied.

2.6.6 Duration from onset of rash to time of first consultation with a health care provider

This variable was defined as the time in months from when the patient first noticed the rash to the time they first presented to any health care provider. The health care provider in this instance was either a nurse or doctor in the workplace or someone not related to the workplace (for example a public or private health care provider). In some instances the dermatologist at the NIOH was the first contact a patient had with a health care provider. In this instance the date of first visit was used to calculate the duration from onset of rash to first consultation.

2.6.7 Change in job

The participants in the telephone interview were asked if they were still employed at the same employer and if they were still in the same job. Those who were with the same employer were asked to clarify if they were still doing the same job as when diagnosed with the dermatosis or if they had been redeployed within the company.

Participants who had changed employers were asked to clarify if they were still exposed to the same agents that were suspected of causing the dermatosis. These participants were also asked to indicate their reason for leaving the previous employer.

2.6.8 Out of pocket payments for health care related to the dermatosis

This was defined as any payment that was made to cover medical costs related to the dermatosis. This may have been payments made to general practitioners or specialists. In

instances where a participant was on a medical aid the monthly medical aid contributions were not included. However, where the participant had to pay costs not covered by the medical aid, expenditure was included. The participants were given a range if they could not remember the amounts spent. They were asked to indicate if it was less than R100 or more than R100 per month. Indirect costs such as transport costs were not included.

They were also asked to indicate in months how long they had to make these payments. In the case where they could not remember the duration, they were asked to indicate if they thought it was for less or more than six months. In cases where the participant indicated that the cost was still ongoing, the time was calculated to the date of the telephone interview.

2.6.9 Loss of income

Participants were asked to report if they felt that they had lost income as a result of the dermatosis. This included loss of wages or salary due to absenteeism as a consequence of the dermatosis. They were asked to quantify this in rands per month and the duration of this loss in months. If a participant could not recall this information they were given a range to choose from. They were asked to indicate if it was less than R500 or between R500 - R1 000 or more than R1 000 per month. They were given a range of either less than or more than six months duration.

2.6.10 Loss of promotion at work

The participants were asked to report if they had lost out on promotional opportunities as a result of their dermatosis. This question was asked of everyone. This was to ascertain if participants not diagnosed with an OCD felt that their skin condition resulted in loss of promotion.

2.7 Analysis

STATA 10 was used to do the descriptive and analytical analysis.

2.7.1 Descriptive

The descriptive analysis was done using means where the data were normally distributed. Medians were used if the data were skewed. Ranges were calculated for the skewed data. A histogram was constructed to decide on the symmetry and kurtosis of the data. Frequencies were used to quantify the occupations, the industries and the agents of the participants.

Proportions were calculated for variables that were dichotomous (e.g. sex) or categorical (e.g. agent exposed to.) Chi square tests were used to investigate whether the difference between the proportions were statistically significant.

The findings from the open ended questions in the telephone interview were analysed using qualitative techniques. The responses were coded and grouped into themes. MAXQDA 2007 was used to analyse these data.

2.7.2 Multivariate

Several logistic regression models were run to identify predictors of being diagnosed with occupational dermatosis, whether workers changed jobs after visiting the clinic and whether they experienced a loss of income. Variables were selected for the logistic regression model *a priori*. Table 2.2 shows the outcome and candidate independent variables used in the logistic regression model.

Table 2.2 The outcome and predictor variable used *a priori* in the logistic regression model

Outcome variables	Predictor variables	
1. Salary lost	• Age	• Industry size
2. Same employer	• Sex	• Patch test results
	• Site of dermatosis	• Occupational classification
	• Exposure agent	

2.8 Ethical considerations

Ethics approval was obtained from the Human Research Ethics Committee of the University of the Witwatersrand, Johannesburg. The ethics approval number is M080410 (Appendix F).

Participants signed a consent sheet (Appendix E) when they first presented to the dermatology clinic giving permission for their records to be used for research purposes. There were no cases where this consent sheet had not been signed.

Verbal informed consent was obtained from all participants prior to conducting the telephone interview. The researcher explained the purpose of the study and verbal consent was obtained to be included in the study. The participants were given the option of opting

out of the study at the time of the interview or at a later stage. The researcher also assured participants that non-participation would not affect the service that the NIOH delivered to them or the outcome of any cases pending at the Commissioner. All data were de-identified when entered into the database using a unique identification number. The three sets of data were linked through the use of the identification number.

The occupational dermatology clinic routinely follows up cases submitted to the Commissioner. Enquiry into the status of claims was thus part of the service rendered to patients seen at the clinic.

The data capture sheets and the electronic data are being kept at the occupational health clinic. The data will only be accessible to the staff of the clinic. Data will be kept for the required five years which is in keeping with good research practice.

Chapter 3 Results and Findings

In this section the study results will be presented. The study was done in three stages and the results will be presented accordingly. The first section is a review of the medical case records of the cases seen at the NIOH from August 2005 to December 2007. It describes the demographic profile of the cases; their diagnosis; the site of their rash; if co-workers were affected; the duration of exposure to suspected agents; the time to diagnosis; the time from the diagnosis to the researcher's visit to the Commissioner's office (to determine the delay in the claims being settled); the skin patch test results; the level of skill of the participants; their industries and the suspected agents they were exposed to. The industries they worked in are also classified. A comparison is done between the cases who were diagnosed with occupational contact dermatitis (OCD) and those with a non occupational skin disease.

The second part is an analysis of information derived from the telephone questionnaire that was administered to the participants who could be accessed telephonically. Occupational considerations include a description of the number of participants still employed at the same employer and in the same job and their current exposure to the same suspected agents. The financial implications are described in terms of loss of income due to the skin condition, loss of promotion at work and out of pocket payments for the medical care for their skin condition. The findings of OCD and non OCD participants are contrasted.

The findings of the open ended question looking at the perceptions of the two groups are listed. The experience of those diagnosed with OCD with the Commissioner's office is also shown.

The third part of the analysis focused on those cases that were diagnosed with OCD and the outcomes of claims submitted for occupational compensation. These cases are described and measures of association are used to explore significant relationships between cases diagnosed with OCD and those who did not have an OCD. Multivariate analysis was done to examine factors that might influence the diagnosis of OCD and the outcome of the compensation process. The variables used in the regression model were decided *a priori*.

3.1 Review of medical records

A total of 129 cases were reviewed from the dermatology clinic at the National Institute for Occupational Health. However, only 128 cases were included in the analysis because one case was a 13 year old and not employed.

3.1.1 Socio-demographic characteristics

The mean age was 41.1 years and the standard deviation was 11.2 with a normal distribution. There were 93 (72.7%) males and 35 (28.3%) females. The mean age of those diagnosed with occupational contact dermatitis (OCD) was 41.9 years and the standard deviation was 10.1. There were 48 (75%) males and 16 (25%) females diagnosed with OCD.

3.1.2 Diagnosis

Allergic contact dermatitis (ACD) was diagnosed in 37 (28.9%) cases and of these 35 was related to occupation. Irritant contact dermatitis (ICD) was diagnosed in 36 (28.1%) cases and of these 29 was occupational. In 64 cases (50.0%) the diagnosis was either not clear or

not related to the occupation. This included conditions such as fungal infections, eczema, psoriasis and Kaposi's sarcoma. There were also cases where the participants had developed a dermatosis to agents common to the workplace and the general environment e.g. nickel.

3.1.3 Site of rash

The hands were the most common site for a rash and occurred in 59 cases (46.1%). In 50 cases (39.1%) it occurred in other areas like the trunk, back, groin and feet. In 15 cases (11.7%) it occurred on both the hands and the face and neck and in four cases (3.1%) it occurred on the face and neck.

In the 64 patients diagnosed with OCD, 36 cases (56.3%) had a rash on only their hands, in 16 cases (25.0%) in other areas like the trunk, back, groin and feet, 9 (14.1%) had it on their hands, face and neck and three (4.7%) had it on their face and neck.

3.1.4 Co-workers affected

Thirty cases (23.4%) reported that co-workers had a similar rash. Forty five cases (35.1%) stated that there were no other workers with a similar rash. The remaining 53 cases (41.4%) were not sure if another co-worker had a similar rash.

In the 64 cases diagnosed with OCD, 19 (29.7%) reported that co-workers had a similar rash and 24 (37.5%) stated that there were no other workers with a similar rash; the remaining 21 (32.8%) were not sure if any co-workers were affected.

3.1.5 Duration of exposure to an agent

The median duration of exposure to an agent for all 128 cases reviewed was 60 months (range 1 - 348 months; SD= 92.7). The median duration of exposure for the 64 cases diagnosed with OCD was 96.8 months (range 1 - 324 months; SD= 90.9).

3.1.6 Duration from appearance of the rash to diagnosis

The median duration from the appearance of the rash to the time of diagnosis for the total 128 cases was 12 months (range less than 1 month to 300 months; SD = 29.9.) The median duration from the time of appearance of a rash to the time of diagnosis for the 64 cases diagnosed with OCD was 32.8 months (range less than 1 month to 300 months; SD= 56.3).

3.1.7 Skin patch test results

Skin patch tests (SPT) were done on 96 (75.0%) of the 128 cases. In 44 (45.8%) of these, the patch tests were positive; 38 (39.6%) were negative and 14 (14.6%) were equivocal. The SPT may have been positive in some participants for allergens unrelated to their industry e.g. nickel.

In the 64 cases submitted to the Commissioner 54 (84.4%) had skin patch tests done. Thirty three (61.1%) of these were positive; 15 (27.8%) were negative and six (11.1%) were equivocal.

3.1.8 Deaths

Five deaths were recorded. None of the deaths was directly attributable to their skin condition. The causes of death included underlying HIV/AIDS (3), occupationally unrelated skin carcinoma (1) and an accidental death.

3.1.9 Level of skill, the industries and the suspected agents cases were exposed to

In Table 3.1 below, the 128 cases are compared to the cases that were diagnosed with occupational contact dermatitis (OCD) and those that were not. This table describes the level of skill of the cases, the different industries of the cases and the suspected causative agents.

Table 3.1 shows that the distribution of cases in the cohort diagnosed with OCD and those with an occupationally unrelated dermatosis was more or less equal. The distribution between unskilled workers and skilled and professional workers was similar.

The most common industries seen at the dermatology clinic were engineering, mining, manufacturing and health. OCD was also most commonly diagnosed in these industries. Due to low numbers in some industries a number of industries had to be collapsed into a cumulative category called “other.”

Workers were exposed to a range of agents and in some cases there were multiple exposures suspected. There were cases where a specific agent could not be identified. The

most common suspected exposure agents were chemicals, oils and greases, detergents, metals and nickel.

Table 3.1 The occupation or job description of 128 cases seen at the dermatology clinic, the 64 cases that were diagnosed with OCD and the 64 cases that were diagnosed with a skin condition which was not occupationally related. The level of skill of the cases, industries they were from and the agents they worked with are listed

	Total number of case records reviewed N=128 (%)	Diagnosed with occupational dermatitis n=64(%)	Diagnosed with skin condition other than OCD n=64 (%)
Occupation category			
Unskilled Worker [a]	59 (46.1)	29 (45.3)	30 (46.9)
Skilled Worker[b]	58 (45.3)	30 (46.9)	28 (43.8)
Professional [c]	11 (8.6)	5 (7.8)	6 (9.4)
Industry			
Engineering	33 (25.8)	15 (23.4)	18 (28.1)
Mining	20 (15.6)	8 (12.5)	12 (18.8)
Manufacture	12 (9.4)	7 (10.9)	5 (7.8)
Health	9 (7.0)	8 (12.5)	1 (1.6)
Motor	8 (6.3)	2 (3.1)	6 (9.4)
Food	8 (6.3)	2 (3.1)	6 (9.4)
Refineries	6 (4.7)	6 (9.38)	0 (0.0)
Retail	5 (3.9)	2 (3.1)	3 (4.7)
Foundries	5 (3.9)	4 (6.3)	1 (1.6)
Other [d]	22 (17.2)	10 (15.6)	12 (18.8)
Agents exposed to	**N=171 [e]**	**n=83 [e]**	**n=88 [e]**
Chemicals	22 (12.9)	8 (9.6)	14 (15.9)
Oils and grease	26 (15.2)	14 (16.9)	12 (13.6)
No agent identified	25 (14.6)	11 (13.3)	14 (15.9)
Epoxy resins	16 (9.4)	5 (6.0)	11 (12.5)
Water and humidity	13 (7.6)	4 (4.8)	9 (10.2)
Detergents	11 (6.4)	6 (7.2)	5 (5.7)
Latex and rubber	10 (5.9)	3 (3.6)	7 (7.9)
Metals			
Nickel	10 (5.9)	8 (9.6)	2 (2.3)
Other metals	11 (6.4)	8 (9.6)	3 (3.4)
Other [f]	27 (15.8)	16(19.3)	11(12.5)

a. Workers were classified as unskilled if no formal training was needed for the job being done. These were mainly manual labourers. This included cleaners, fettlers, workers in mines not trained for a specific job.
b. Skilled workers were those who had acquired skill either through specific training or had a formal education for the skill. These included spray painters, mechanics, miners and hairdressers.
c. Professionals were defined as workers who had formal training for a specific skill. This would usually be a tertiary education. These included laboratory technicians, nurses, doctors and engineers.
d. Other industries included the construction, milling, textile, and beauty and cosmetic industries.
e. The sample size for the agents is greater than the total number of participants because some participants may have been exposed to more than one agent.
f. Other agents included for example heat, leather, wool, alcohol, fragrances, flavourings and biological agents like fungi and bacteria.

In Figures 3.1 and 3.2 the jobs and suspected agents of those diagnosed with OCD are listed.

The jobs of 64 patients diagnosed with OCD

- Labourers (24)
- Fitter and turner (7)
- Moto mechanics (6)
- Cleaners (5)
- Artisans (4)
- Nurses (4)
- Fettlers (3)
- Spray painters (2)
- Hairdressers (2)
- Mould makers (2)
- Technicians (2)
- Office clerk(1)
- Miners (2)

Figure 3.1 The jobs of cases diagnosed with OCD

The allergens/irritants to which 64 patients diagnosed with OCD were exposed to

- Nickel (8)
- Oils (8)
- Detergents (6)
- Metals (6)
- Epoxy resins (5)
- Greases (5)
- Dust (5)
- Humidity (4)
- Heat (4)
- Rubber/latex (3)
- **Silica (3)**
- Leather (2)
- Alcohol (2)
- Wool(2)
- **Exhaust fumes (1)**
- Platinum salts (1)
- **Mica (1)**
- **Paint stripper (1)**
- **Cement (1)**
- Chrome (1)
- Food(1)
- Perfumes (1)
- Bacteria (1)
- **Acrylate (1)**
- Not identified (9)

Figure 3.2 The agents of exposure of all cases diagnosed with OCD. Agents classified as chemicals in Table 3.1 in the OCD group are in bold in Figure 3.2 above

Figure 3.1 illustrates that labourers were the overwhelming majority of workers diagnosed with OCD. The other top ranking occupations included fitters and turners, motor mechanics and cleaners. Figure 3.2 ranks the agents participants with OCD were exposed to. The agents highlighted in bold are the agents that are classified as chemicals in Table 3.1.

Nickel, oils and greases, detergents, metals and epoxy resins were the most common agents OCD cases were exposed to. No specific agent could be indentified in nine OCD cases.

3.1.10 Classification of the industry size

The industries were classified into three categories according to the number of employees. Table 3.2 compares the total cohort seen in the clinic with the cases that were diagnosed with OCD. Industries with employees of 10 or less employees were classified as a micro industry. These included industries like panel beaters, hairdressers and beauty salons.

An industry was classified as small if it had between 11 and 100 employees. The typical industries for this category included mainly manufacturing and engineering industries. The types of jobs here varied from diesel and motor mechanics to various artisans like fitters and turners and tool makers.

There were 65 cases in the large industry (more than 100 employees) category. These came mainly from the mining industry and foundries.

Table 3.2 Classification of the work places of 128 cases and the 64 cases diagnosed with OCD according to the number of employees in the industry. Industries were classified as micro (less than or equal to 10 employees), small (11-100 employees) and large (> 100 employees)

Size of industry	The total case series N=128 (%)	The cases that were diagnosed with OCD n=64 (%)
Micro	13 (10.2)	8 (61.5)
Small	50 (39.0)	27 (54.0)
Large	65 (50.8)	29 (44.6)

3.2 Data from the telephone interviews

3.2.1 Number of participants interviewed

One hundred and twenty eight cases were considered for the telephone interview. Ninety four participants were recruited for the telephone interview. This was a response rate of 73.4%. Forty seven of the 64 participants diagnosed with OCD responded to the telephone interview. (This constituted 50.5% of all respondents and 73.4% of OCD participants.) One participant was excluded from the analysis because after concluding the interview he asked for the interview to be disregarded because he feared his employer would discriminate against him. The participant that asked to be excluded was treated as a non responder and 93 participants were included in the analysis. The remaining patients were not contactable either because they had either died or their telephone numbers had changed and an alternate number was not available.

3.2.2 The occupational considerations of the telephone interview

The median time from diagnosis to the time of the interview was 22 months for all 93 participants interviewed. The median time from diagnosis to the time of the interview for the 46 OCD participants was 20 months.

In Table 3.3 below the 93 telephone interviews are presented by all interviews and the OCD and non OCD cases are compared. Sixty nine (74.2%) of 93 participants were still employed at the same employer and 33.3% of them were still in the same job as at the time of diagnosis of their skin condition. Almost half (49.5%) of all participants reported that they were still exposed to the same agents that they suspected of causing their skin condition.

It is notable that just over half (52.2%) of participants with OCD were still exposed to the same agent suspected of causing their skin condition and that large proportions of the participants felt that their skin disease affected work performance. The OCD and non OCD participants provided similar responses except for effect on work performance, where a significantly larger proportion of the OCD participants (91.3%; n=42) reported a negative impact.

Table 3.3 Employment status, and financial and occupational implications of skin condition for respondents to telephone interview

	Total number of interviews done N=93 (%)	OCD participants interviewed n=47 (%)	Non OCD participants interviewed n=46 (%)
Employment and agent exposure status at time of interview			
Still working at the same employer (p=0.313 n=93)	69 (74.2)	37 (78.7)	32 (69.6)
Still working in the same job (p=0.234; n=89)	31 (33.3)	18 (40.9)	13 (28.2)
Still exposed to the same agents (p=0.777; n=91)	46 (49.5)	24 (52.2)	22 (47.8)
Financial implications for participants			
Loss of income due to skin condition (p=0.574; n=91)	20 (22.0)	9 (19.6)	11 (24.4)
Loss of promotion at work due to skin condition (p=0.318; n=91)	14 (15.1)	8 (17.4)	6 (13.3)
Out of pocket payments made towards treatment of skin condition (p=0.063; n=91)	56 (61.5)	24 (52.2)	32 (71.1)
Occupational implications for participants			
Skin condition affected work performance (p=0.03; n=91)	75 (82.4)	42 (91.3)	33 (73.3)

The p-values are Chi square tests of the proportions in the OCD and non-OCD groups. Denominators vary due to missing information. The only significant association was if the skin condition affected their work (p= 0.03.) Out of pocket payments (p= 0.063) was of borderline significance. The rest of the p-values were not significant.

Twenty two (23.7%) participants reported that they felt that they had lost their jobs as a direct consequence of their skin condition. One person retired early as a result of the associated dermatitis; 11 (11.8%) were unemployed; eight (8.6%) had moved to a new job because they could not be relocated within their initial exposure jobs; and two moved for reasons they did not want to disclose.

3.2.3 Financial considerations reported during the telephone interview

Ninety three participants were interviewed and 91 were able to indicate if they lost income due to their skin condition and 45 (49.5%) of these 91 participants were diagnosed with OCD. Twenty (21.9%) of the 91 participants indicated that they perceived that they had lost income as a result of their dermatosis. Eleven (24.4%) of the OCD participants indicated that they had lost income due to their dermatosis. Six (13.3%) of the 45 OCD participants perceived that they had lost out on promotion at work due to their skin condition.

Fifty six (61.5%) of the 91 participants indicated that they had to make out of pocket payments for their skin condition. Thirty two (71.1%) of the 45 OCD participants indicated that they had to make out of pocket payments for their skin condition. Thirty four (60.7%) of the 56 who indicated they had made out of pocket payments were able to quantify the

amount paid. Fifteen (26.8%) of the 56 who could quantify this amount were diagnosed with OCD. The median amount paid out of pocket by the OCD group was R260 per month (range 20-900; SD 214.7); and the median duration of this payment was 15.9 months (range 1-36 months; SD 11.9).

3.3 Qualitative findings of participants interviewed

The perception of the impact of skin disease on the social, financial and occupation aspects of the lives of the participants was very similar for those with a diagnosis of OCD and the non OCD group. Generally all participants perceived that their skin condition had a negative impact on their lives. There were however, participants who were ambivalent about the effect their skin disease had had on their lives. Men and women responded similarly. Illustrative responses of the participants are shown in Figure 3.3 below.

Occupational impact of dermatosis

"I could not work and stayed out of work a lot. They (the employer) *told me that I was just lazy and that if I did not work I should leave. This made me so emotional." (*Female, 52, nurse, non occupational dermatosis)

"I was told to get another job if I could not continue to work in the workshop." (Male, 42, mechanic, OCD)

"The nurse at the work clinic said my rash was not serious enough and she did not submit my forms (for compensation)*."* (Female, 45, fettler of ceramics, OCD)

Financial impact of dermatosis

"I feel that the company is delaying this whole process (of the claim being settled). *I am sure I didn't get promoted because of my skin and my salary did not increase."* (Male, 56, process controller at a refinery, non occupational dermatosis)

Social impact of dermatosis

"It (the skin dermatosis) *affected me greatly. I was too embarrassed by what people said. I could not touch my wife."* (Male, 44, instrument technician, non occupational dermatosis)

"This skin problem makes me very embarrassed at work and home." (Male, 41, inventory controller at a mine, non occupational)

"People stare at me all the time. This is very embarrassing." (Female, 34, upholster, OCD)

Figure 3.1The occupational, financial and social impact of dermatosis on participants

Participants diagnosed with OCD reported on their experience with the Commissioner's office and their perception of the compensation process. The majority of people (86%, n=43) were not happy with the level of service they received from the Commissioner's office. They expressed discontent with the lack of feedback from this office. They felt that the time to process claims was too long. Twelve participants (27.9%; n=12) were not even aware that a claim had been submitted for them. Illustrative comments are listed in Figure 3.4 below.

The experience with the Commissioner's office of participants diagnosed with OCD

"I called them (the Commissioner's office) *but they kept saying that they would call me back. They never did."* (Male, 42, fitter and turner)

"I had a very good experience with the compensation people; my claim was settled very quickly." (Male, 25, boiler maker)

"I waited three years and still did not get my money." (Male, 42, winch operator)

"I did not even know that claim had been submitted for me." (Male, 36, motor mechanic)

Figure 3.4 The perception of participants diagnosed with OCD of the Commissioner's office

3.4 Participants eligible for compensation

3.4.1 Results of the outcomes of the participants eligible for compensation

Of the 64 participants, only eight had been resolved by the Commissioner's office by the time the researcher visited the office of the eight, six had received compensation and two had been repudiated.

The successful resolution of a claim depended on the Commissioner receiving all the necessary documentation. In Table 3.4 below the outstanding documents are listed according the Commissioner's electronic records.

Table 3.4 The number and proportion (multiple responses) of documents that had not been captured on the electronic database at the Commissioner's office for the 64 cases in 2008

Document type [a]	Number of outstanding documents N=64(%)
WCL 1 (Employers report of an occupational disease)	46 (71.9)
WCL 14 (Notice of an occupational disease and claim for compensation)	46 (71.9)
WCL 22 (First medical report in respect of an occupational disease)	49 (76.6)
WCL 26 (Final or progress medical report in respect of an occupational disease)	48 (75.0)
Dermatology report	54 (84.4)
WCL 10 (The exposure history)	55 (85.9)
Results of special investigations	47 (73.4)
Final medical report	50 (78.1)
National identity document	48 (75.0)
Salary advise slip	47 75.8)

a. See Table 1.1 in the introduction for a description of these documents

It should be noted that failure to have a document recorded in the Commissioner's electronic records does not mean that the document was not submitted. Documents are required from the employer, the employee and the attending doctor, in this setting the NIOH. These parties may have submitted claims but the Commissioner may either not have received them or there may have been failure to register these records on the electronic system. The Commissioner may thus have received all documents (usually by fax) but failed to capture them in their electronic records. If records did not appear on the electronic data base the Commissioner's office regarded it as missing.

In order to verify the accuracy of the Commissioner's office's records the researcher called the employers to see how many claims the employers said they had submitted. There were 33 (52.4%; n=56) cases where the employer reported that they had submitted the necessary documentation to the Commissioner's office. The medical records were cross referenced to see which records had verification of a fax sent by the NIOH to either the employer or the Commissioner's office or both. The employer had not submitted the necessary documentation in 25 cases (44.6%; n=56.)

3.4.2 Duration from first visit to NIOH until the visit to the Commissioner's office

The duration from the date the NIOH submitted claim forms to the Commissioner's office to the researcher's visit to the office was a median of 19 months (SD 8.7; range 4-29 months).

3.4.3 Description of the resolved cases

In Table 3.5 below the characteristics of the cases that were resolved are compared to the cases that were unresolved. There were eight cases that were resolved and 56 cases that remained unresolved at the time of the visit to the Commissioner's office. Of the eight resolved cased six had received compensation and two cases had been rejected.

Table 3.5 below shows that all resolved cases were men. The majority of the cases (83.3%) had a positive skin patch test. The majority of the cases (37.5%) were from the health industry. Four cases (50%; n=8) were from a micro industry. Two of the resolved cases were not included in the telephone interview. One case could not be contacted and the other

person had died. The analysis of the telephone interview shows that four of six participants (66.7%) were still employed at the same employer. Three participants reported that they were still exposed to the suspected agent that caused the skin condition.

Table 3.5 The characteristics of the eight cases that were resolved versus 56 cases that were unresolved at the time of the visit to the Commissioner's office

Number	**Resolved cases**	**Unresolved cases**
	n=8 (%)	**n=56 (%)**
Mean age (p= 0.309; n=64)	45.6	41.4
Sex: male (p= 0.081; n=64)	8 (100)	40 (71.4)
Skin patch test positive (p= 0.450; n=54)	5 (83.3)	28 (58.3)
Industry [a] (p= 0.588; n=64)		
Health	3 (37.5)	5 (8.9)
Mining	1 (12.5)	7 (12.5)
Foundries	1 (12.5)	3 (5.4)
Engineering	1 (12.5)	14 (25.0)
Refineries	1 (12.5)	5 (8.1)
Retail	1 (12.5)	1 (1.8)
Industrial classification[b] (p= 0.003; n=64)		
Micro industry	4 (50)	4 (7.1)
Small industry	2 (25)	25 (44.6)
Large industry	2 (25)	27 (48.2)
Employment history	**n=6 (%)** [c]	**n=42 (%)**
Still working at same employer (p= 0.279; n=47)	2 (40)	8 (19.1)
Still exposed to same suspected agents (p= 0.850; n=47)	3 (50.0)	21 (51.2)
Financial impact (p= 0.222; n=46)		
Loss of income due to skin condition	3 (60)	34 (82.9)

a. Only the industries that the eight cases came from are listed. The complete spectrum of industries the unresolved cases originated from is not listed.

b. Industries were classified as micro (less than or equal to 10 employees), small (11-100 employees) and large (> 100 employees.)

c. Only six cases were used for this analysis because one case could not be contacted and the other had died.

3.4.4 Multivariate

This section describes the logistic regression models constructed. The outcome variable in Model 1 is salary lost and the outcome variable in Model 2 is a resolved claim. Model 3 describes the predictors of cases with OCD who were still exposed to the same agents in the work place. Model 4 shows the predictors for settlement of a claim. The predictor variables are sex, age, site of diagnosis and agents skin patch test results, level of skill and industry size. Table 3.6 below describes the univariate analysis done.

Table 3.6 The univariate analysis of the predictor variables used in the multivariate analysis

Predictor variables	Outcome variables			
	Salary lost OR (95% CI) p-value	**Exposed to same chemical OR (95% CI) p-value**	**Diagnosed with OCD and still exposed to same chemical OR (95% CI) p-value**	**Claim resolved OR (95% CI) p-value**
Sex	0.68 (0.24-1.96) p=0.470 n=91	1.03 (0.42-2.56) p=0.947 n=91	2.05 (0.59-7.15) p=0.260 n=45	-
Age	0.97 (0.92-1.01) p=0.204) n=91	0.99 (0.95-1.03) p=0.553 n=91	0.99 (0.95-1.05) p=0.975 n=45	0.96 (0.89-1.03) p=0.307 n=64
Site of diagnosis	1.12 (0.84-1.65) p=0.341 n=91	**1.33 (1.00-1.76) p=0.048** n=91	1.31 (0.88-1.97) p=0.184 n=45	1.10 (0.66-1.83) p=0.704 n=64
Agents exposed to				
Agent not known	1.29 (0.34-4.85) p=0.711 n=91	1.44 (0.48-4.29) p=0.515 n=91	1.33 (0.29-6.04) p=0.709 n=44	1.58 (0.14-17.22) p=0.708 n=48
Metals	1.13 (0.34-4.85) p=0.895n=91	0.59 (0.48-4.29) p=0.496 n=91	3.00 (0.70-12.93) p=0.140 n=44	0.43 (0.82-2.31) p=0.328 n=48
Other[a]	1.29 (0.37-4.42) p=0.690 n=91	1.50 (0.54-4.15) p=0.438 n=91	-	-
Skin patch results				
SPT negative	2.33 (0.69-7.85) p=0.174 n=69	0.66 (0.25-1.70) p=3.91 n=69	1.22 (0.27-5.60) p=0.796 n=30	3.57 (0.39-32.96) p=0.262 n=54
Occupational class (Reference: unskilled)	0.89 (0.32-2.34) p=0.781 n=91	0.67 (0.23-1.53) p=0.343 n=91	0.92 (0.28-2.95) p=0.884 n=45	4.30 (0.80-23.25) p=0.090 n=64
Industrial class (Reference: small industry)	1.33 (0.94-1.91) p=0.107 n=91	1.01 (0.77-1.33) p=0.923 n=91	0.97 (0.66-1.43) p=0.873 n=45	1.41 (0.80-2.47) p=0.232 n=64

a. Other agents included for example heat, leather, wool, alcohol, fragrances, flavourings and biological agents like fungi and bacteria

The 95% crude odds ratios (ORs) all spanned one, and there were no significant p values in the univariate analysis except for a borderline result highlighted in bold in Table 3.6. This may be due to the low power of the study. There was a 1.33 greater chance of the hands

being the site of the dermatitis if workers were still exposed to the same agents in the workplace. There was a 2.33 greater chance for loss of income if the dermatitis was diagnosed on the hands. There was a 3.57 times greater chance for a claim to be resolved if the skin patch test was positive and a 4.30 greater chance of the claim to be settled if the worker was a professional. There was a 1.41 greater chance of the claim being settled if the worker was from a larger industry.

Table 3.7 Model 1 predictors of loss of salary in all participants interviewed (n=69)[a]

Variable	OR	95% CI	p-value
Sex (male)	0.57	0.13-2.41	0.445
Age	1.01	0.94-1.07	0.865
Site of diagnosis (hands)	1.19	0.76-1.85	0.450
Agent: Chemical	(reference)		
Not known	0.61	0.96-3.91	0.603
Metals	0.41	0.45-3.45	0.415
Other agents [b]	0.34	0.61-1.95	0.229
Skin patch test results:			
Positive test	(reference)		
Negative	3.61	0.90-14.53	0.070
Occupational class:			
Unskilled workers	(reference)		
Professionals and skilled workers	1.44	0.37-5.75	0.60

[a.] The number of observations was reduced as a result of missing data.

[b.] Other agents included for example heat, leather, wool alcohol, fragrances, flavourings and biological agents like fungi and bacteria.

No significant predictors of loss of salary were identified in Model 1 (Table 3.8 above). However, some ORs were elevated or well below one but all CIs spanned one. Men were 0.57 times less likely to report loss of income and professionals and skilled workers were

1.44 times more likely to report loss of income due to OCD. Participants with a negative patch test were 3.61 times more likely to report loss of income due to OCD.

Table 3.8 Model 2 predictors of all participants who are still being exposed to the same agents suspected of causing the skin dermatitis (n=69)[a]

Variable	OR	95% CI	p-value
Sex (male)	1.30	0.390-4.354	0.666
Age	**0.97**	**0.897-1.00**	**0.050**
Site of diagnosis			
Hands	(reference)		
Other than hands	1.28	0.894-1.836	0.177
Agent: Chemical	(reference)		
Not known	1.35	0.314-5.804	0.686
Metals	0.79	0.136-4.543	0.789
Other agents [b]	1.18	0.293-4.716	0.820
Skin patch test results:			
Positive test	(reference)		
Negative	2.60	0.595-11.363	0.204
Occupational class:			
Unskilled workers	(reference)		
Professionals and skilled workers	4.60	0.470-44.996	0.190

[a] The number of observations was reduced as a result of missing data.

[b] Other agents included for example heat, leather, wool alcohol, fragrances, flavourings and biological agents like fungi and bacteria.

Only age was significantly associated with continued exposure in older participants. However, some ORs were elevated. Model 2 (Table 3.8 above) shows that men are 1.30 times more likely to still be exposed to the same agents suspected of causing the dermatitis. There was a 1.35 greater risk of still being exposed to the same agent if the agent is not known. The risk is 2.60 times greater for continued exposure of the suspected agent causing the dermatitis if the skin patch test was negative. Skilled and professional workers had a

4.60 times greater risk of continued exposure to the suspected agent. Age was marginally significantly associated with a lower likelihood of still being exposed to the agents. For each year that a respondent was younger they had 3% lower chance of still being exposed to the suspected causative agent.

Table 3.9 Model 3 predictors of participants diagnosed with OCD who are still exposed to the same agents in the work place suspected of causing the OCD (n=29)[a]

Variable	OR	95% CI	p-value
Sex (male)	4.07	0.47-36.88	0.212
Age	1.01	0.92-1.11	0.827
Site of diagnosis:			
Hands	(reference)		
Other than hands	1.27	0.68-2.36	0.457
Agent:			
Chemical	(reference)		
Not known	2.69	0.24-30.32	0.424
Other agents [b]	14.72	0.93-234.31	0.057
Skin patch test results:			
Positive test	(reference)		
Negative	2.34	0.24-23.12	0.465
Occupational class:			
Unskilled workers	(reference)		
Professionals and skilled workers	0.31	0.04-2.18	0.239

[a] The number of observations was reduced as a result of missing data.

[b] Other agents included for example heat, leather, wool, alcohol, fragrances, flavourings and biological agents like fungi and bacteria.

In Model 3 (Table 3.9 above) the 95% confidence intervals all spanned one and there were no significant p-values less than 0.05. However, men were 4.07 times more likely to still be exposed to the same agents even after been diagnosed with OCD. There was a 2.69 times greater chance of continued exposure in OCD cases if the agent was not known. There was a 2.34 greater chance of continued exposure of OCD cases if the SPT was negative.

Table 3.10 Model 4 predictors for settlement of a claim (n=30)[a]

Variable	OR	95% CI	p-value
Age	1.14	0.95-1.36	0.153
Site (hands)	1.40	0.52-3.70	0.512
Skin patch test results			
Positive	(reference)		
Negative test	17.19	0.55-540.86	0.106
Industry			
Industries <100 employees	(reference)		
Large industries (>100 employees)	4.56	0.0.22-5.04	0.328

[a] The number of observations was reduced as a result of missing data.

Model 4 (Table 3.10 above) shows that there is a 1.40 times greater chance of a claim being settled if the rash was on the hands. A positive skin patch test was associated with 17.19 times higher chance of a claim been settled, although not significantly.

The odds ratios have very wide confidence intervals in many of the univariate and multivariate results. The small sample size meant that the study was under-powered. The results have to be interpreted with caution but they give an idea of which factors could possibly have being important if the sample size was larger.

Chapter 4 Discussion

The aim of this study was to describe the patients seen at the NIOH dermatology clinic; to describe the industries where patients worked and the exposure agents; and to describe the impact of the psychosocial, financial and occupational outcomes on cases. This study showed that the majority of the OCD patients (75%) seen were men and that ICD and ACD were almost equally common. OCD was most commonly diagnosed on the hands (56.3%). There was a long exposure period to the suspected agents (96.8 months) and a long delay between the onset of the rash and when the diagnosis was made (32.8 months) in the OCD patients. The occupational, financial and social impact of having a skin condition affected OCD and non OCD patients. Only eight patients were finalised by the time of the assessment of claim resolution. The study illustrated the failure of the compensation system to deliver benefits to the claimants for occupational diseases.

4.1 Description of patients seen at NIOH

Gender

The majority (75%) of the 64 patients diagnosed with OCD were male. Several studies (Slodownik, *et al* (2008) and Belsito, *et al* (2005)) reported a higher prevalence amongst females.[8,11] The main reason cited for this is that the women are exposed in the workplace to agents that are high on the list of common irritants or allergens e.g. "wet work."[32] However, there appears to be no inherent difference between men and women; but different occupational exposures may predispose women to greater susceptibility than men.[33] In this study the larger number of men diagnosed with OCD may be due to the employment patterns in the referral area as there are more men in employment but it does

raise the concern of the accessibility of women to occupational health services. Ryan in a 1994 study concluded that in many parts of the world women receive less attention than men for skin diseases.[84]

ICD vs. ACD in the dermatology clinic

Irritant contact dermatitis is often reported as being the more common form of OCD (70-80% of OCD cases) in the occupational setting.[6,9,13] In a five year follow up study by Kucenic and Belsito (2002) there was, however, evidence that ACD was more prevalent. ACD was diagnosed in 54.7% of OCD patients and ICD was diagnosed in 45.3% of the 64 OCD patients.[85] There was no real difference in numbers of ACD and ICD patients seen at the NIOH dermatology clinic, but this may be due to a selection bias because patients referred to the NIOH dermatology clinic are referred for in depth investigation for their skin disease; for example patients are often referred for skin patch testing.

Hand dermatitis

The hands are the most common site for developing an OCD.[17] In a study by Lazarov (2006) 88.6% (n=70) of patients had a rash on their hands.[60] The hands are highly visible and skin changes can negatively impact on a person's self image and contribute to feelings of depression and anxiety and may affect interpersonal relationships.[86] Women in particular report a high level of impact on their private lives as a result of developing hand dermatitis.[86] The psychological and social impact of OCD together with its poor prognosis makes primary prevention imperative.[54,67]

Skin patch testing

The diagnosis of OCD can be difficult and requires good occupational history taking and a high index of suspicion. It is not always easy to distinguish between ICD and ACD. The skin patch test (SPT) is a useful diagnostic aid in ACD.[15] With occupational exposure to the agents and an appropriate history a positive SPT is usually diagnostic of ACD.[85] A SPT is specifically requested by the Commissioner as evidence for the diagnosis of ACD.[4] The SPT is however, not always positive in OCD often because the suspected agent may not be part of the test series used. The skin patch test in this study was positive in 61.1% (n=64) of cases submitted to the Commissioner's office and this may have had implications for the resolution of claims submitted to the Commissioner. The multivariate analysis showed an association between a case being resolved and a positive SPT.

Duration of exposure to causative agents

The median duration of exposure from first exposure to the suspected occupational agents to onset of rash for OCD patients was 96.8 months; and for those with a diagnosis of non-occupationally related skin condition it was 60 months. Workers may be exposed to agents in the work place for weeks to years before a rash develops.[11] The long latent period compounds the difficulty in making a diagnosis because the employer and the employee may not attribute causation of the dermatitis to occupational exposure. This may cause delays in the worker presenting to the occupational health services. In some cases the worker may also present to health services where the health practitioner may not make the link between the dermatosis and the vocation of the worker which further delays the diagnosis of OCD. Duration of exposure may affect the social and work related outcomes because a longer duration of exposure after the onset of the rash has a worse outcomes.[11,67]

Delay from appearance of rash to diagnosis

There was a 32.8 month delay between the appearance of the dermatitis and the diagnosis of the rash at an occupational health facility. There are several reasons to explain this: workers may think that the rash is not serious and that it will disappear they may not have access to occupational health services or workers may fear being dismissed. The latter reason is highly relevant in the South African labour environment where the unemployment rate is high and the supply for unskilled work outstrips the demand.[87]

4.2 The exposure agents, the occupations and the industries

The common irritants and allergens

The most common causative agents seen in patients diagnosed with OCD in the dermatology clinic were nickel, oils and greases, detergents, metals, epoxy resins, dust and humidity. In a number of cases no causative agent could be identified (13.3% of 83 agents).

The allergens and irritants described in this study are in keeping with those described in the literature.[9,46-49] Nickel is the most common allergen described but may be a confounder for the diagnosis of OCD because it is frequently found in a range of commercial domestic products.[50] Nickel sensitisation is especially common in women because nickel is a commonly used alloy in jewelry.[50] There were 83 suspected agents in the 64 cases diagnosed with OCD because of multiple exposures. Multiple sensitisations is important because it increases the risk of developing contact dermatitis and the prognosis is worse.[14,45]

The allergens and irritants described in this study are not representative of some of the more common agents seen in the vocational settings in other countries. Common agents described in the literature include fertilisers, flavours, cement, leather and dyes.[46-49] The types of industries these agents can be found in include the construction, agriculture and food but these industries rarely refer patients to the NIOH. Gauteng does not have a large agriculture sector and this important industry as a source of OCD is not represented in the cohort included in this study. The narrow spectrum of industries seen at the dermatology clinic is a limitation of this study. This should motivate the dermatology clinic to be proactive in setting up surveillance for OCD in these underrepresented industries and in so doing will extend the variety of industries represented in patients seen at the clinic.

OCD is not well understood among the general population. There may also be limited understanding among workers from these industries that the rash they are experiencing is occupationally related. If workers attend primary health care facilitates, providers may not link the rash to occupational exposure and make not appropriate referral to specialist facilities.

The industries represented in the study

The mining, construction and health industries are the most common industries described in the literature and many cases submitted for compensation in this study were from these industries.[2,3,26] Approximately one in eight (12.5%; n=64) of patients were from the mining (eight cases) and health industries (eight cases). These industries may be underrepresented because the mines generally have dedicated occupational health services and may refer cases directly to the Commissioner and the same may apply to health care workers.

4.3 The psychosocial, occupational and financial outcomes of patients seen at the NIOH

Both participants diagnosed with OCD and with a non-OCD condition expressed marked similarities in how their skin disease impacted on their psychosocial lives. The brunt of the psychosocial effects of skin diseases was experienced in interpersonal relationships, perceptions of self image, work performance and productivity. It drained financial resources among people affected by both occupational and non occupational skin diseases.

Psychosocial outcomes

The analysis of the psychosocial impact of skin disease in the study was relatively superficial. It did not completely explore in-depth the impact that the disease could have on individuals and their families. However, the study does give a general indication of how the cohort was affected. The findings from the study were consistent with findings in similar studies cited in the literature.[54,60] The participants reported feeling embarrassed, self conscious and avoidant of social settings. They also reported that it affected personal relationships and this was well illustrated by one respondent who said, *'I was too embarrassed by what people said. I could not touch my wife.'* (This is anecdotal but gives insight into people's experience who have a dermatitis).

There were no significant differences between the responses of men and women. In a study done in 2000 in Cape Town, Jobanputra and Bachmann reported that women in their study experienced more psychosocial consequences than men and having a skin condition affected women in terms of self esteem, clothing choice and anxiety.[89]

Financial outcomes

The study did not investigate how workers thought their skin condition impacted on their finances. The collection of these data posed a challenge because there was a long delay (up to two years) between when the study was conducted and when the participants had been seen in the clinic. Participants could not always recall how much and for what duration they had spent money on medical care related to their skin condition. The assessment of the financial expenditure was further limited because hidden costs like transport costs, loss of income due to loss of promotion opportunities at work and loss of productivity and salary due to presenteeism and absenteeism was not quantified.

The percentage of cases that reported loss of incomes was very similar between the non OCD cases (21.9%) and the OCD cases (24.3%). Fifty six of all participants (61.5%; n=91) reported that they had to make out of pocket payments and 32 (71.1%; n=45) of OCD cases reported having made out of pocket payments. The median out of pocket payouts was R260 per month over 15.9 months. This at face value may not appear to be a large amount of money but when one considers that the majority of the cohort was unskilled workers with low monthly salaries it can be appreciated that it would have impacted on their personal budgets.

The financial impact extends beyond individuals and can affect the productivity of enterprises and ultimately the macro-economy of a country because revenue generated is decreased.[61,62] The economic burden of skin diseases has not been established in South Africa and the costing of the burden of skin disease will help to strengthen the case for

primary prevention in the occupational setting which should reduce spending on secondary and tertiary prevention and compensation claims.

Occupational outcomes

This study showed that 78.7% (n=47) of all OCD participants (ACD and ICD) were still working for the same employer and 40.9% were still employed in the same job as when they were diagnosed with OCD. Twenty four (52.2%) of OCD were still exposed to the same agents suspected of causing the OCD. Three of the eight cases where claims were settled were still exposed to the same agents. These figures are very high for cases diagnosed with OCD. Workers who have a confirmed diagnosis and were compensated for OCD should not be working in the same job where they are exposed to the same allergens and irritants responsible for causing the disease as this is defeating an underlying principal of control of hazards in the workplace. The main reason for workers continuing to work under less than ideal conditions may be for financial reasons in that they may have limited options for seeking alternate employment.

There were 22 (23.7%) participants from the OCD and non OCD groups that reported loss of employment as a direct consequence of the skin disease. Eight (8.6%) of the participants from the two groups indicated that they were forced to seek other jobs because they could not continue to work in the environment that caused or aggravated their skin condition.

Seventy five (75%; n=93) of all workers interviewed indicated that they perceived that their work performances was affected by their skin condition. The OCD cohort reported a higher number (91.3%) of workers affected compared to the non OCD cohort (73.3%). The impact

on work performance is, however, still very high in the respective groups. The extent of the impact of skin disease on work performance was not quantified and is a limitation of this study.

The psychosocial, occupational and financial outcomes of skin diseases in the workplace highlight three important public health considerations. The importance of primary prevention is imperative especially if the poor prognosis of contact dermatitis is considered. Secondly the psychosocial and financial impact of skin diseases on workers is important even if it is not occupationally related. Thirdly, the importance of a well functioning compensation process is important to help protect the worker from the financial burden OCD places on people affected by this common occupational disease.

4.4 The compensation outcomes

Occupational compensation as a form of social security

Skin diseases are often chronic in nature and not life threatening and for this reason may be over-looked by policy makers.[54] One function of the compensation system is to provide social security to workers by a temporary or permanent payment due to occupational injury or disease.[91] This is an important social net for workers from low income brackets. The cost of medical treatment for occupational diseases should be covered by the compensation system and if this is not the case it can have a significant impact on the finances of individuals.[61,62] In this study workers reported that their engagement with the compensation system was not positive and that they did not receive the support that they had anticipated from the Compensation Fund.

The workers' perception of the compensation process

Overall the claimants reported having a poor experience with the Commissioner's office. A limitation of this study is that it did not extensively explore the reasons why claimants reported a negative experience in dealing with the Commissioner's office. In a study looking at the perceptions of employees and their experience with the compensation process in Florida and Wisconsin, USA, Strunin, *et al* in 2004 reported an overwhelmingly negative experience of workers with the compensation process.[78]

The compensation outcomes

Only eight cases (12.5%; n=64) in this cohort had had claims finalised at the time of the visit to the Commissioner's office. The median waiting period for the claims to be settled was 15 months. Of the eight cases finalised only six had received compensation. In 2006 Lazarov, *et al* reported that only 24.3% (n=70) of cases in their study received compensation even though they were diagnosed with OCD.[60] The low number of cases compensated raises concerns about the whole process of submitting and adjudication claims under the COID Act.

All OCD cases seen in this cohort were diagnosed with OCD by a specialist dermatologist with extensive expertise in occupational dermatology; and despite this two claims that were finalised were rejected and 56 (87.5%; n=64) cases diagnosed with OCD were still pending a median of 21 months after the diagnosis. There are several factors that could explain this: the compensation officers who screen cases may not understand why certain cases that do not fulfil all the criteria on a checklist may still be eligible. Secondly, a positive skin patch test is a requested by the Commissioner's office to assist in making a decision of ACD and it

is not present the clerks may erroneously exclude a case on this basis. The skin patch test is not indicated in an irritant dermatitis.[15]

The number of cases compensated is very low when compared to other studies. Holness, *et al* in 1995 reported that 87% (n=230) of cases were resolved successfully in their study.[67] Carman, *et al* (2008) reported that on average 12.3% of cases submitted to the Commissioner's office between 1999-2005 were finalised.[26] The data is not disaggregated according to acceptance or rejection of a claim. There are minimal data available on the number of cases finalised by the Commissioner's office.

Incongruencies in records of the Commissioner's office and the employer

The main reason cited by the Commissioner's office for failure to finalise claims was that there were outstanding documents. A comparison of the records of the Commissioner's office and the NIOH records of forms submitted showed that 25 cases (44.6%; n=56) were pending because the employer had not submitted the necessary documents (WCL 1). Failure by the employer to submit the necessary documents exacerbates the existing backlog at the Commissioner's office and results in "inefficient compensation thereby prejudicing workers who had an occupational injury or disease." (Taylor, 2002).[5]

The COID Act (1993) stipulates that as part of the compensation process the employer needs to submit a WCL 1 form on behalf of the employee.[4] This places the employee at a disadvantage because the compensation process then hinges on the employer being proactive in submitting the necessary documentation. There were instances where the employer was contacted and had indicated that they had not submitted the WCL 1 forms

because they did not agree with the NIOH dermatologist's diagnosis of OCD. This is a contravention of the COID Act on the part of the employer. The COID Act (amended) (1997) makes provision for either fining or imprisoning the employer for failing to comply with the Act. However, the enforcement of the Act is problematic due to human resource constraints.

Failure of the compensation system

The median time (19 months) from submission of a claim until the assessment of claim status was very long. This is also a very long wait for the Commissioner to reach and adjudicate a claim. At the time of the visit none of the pending claims was on the brink of being settled. The reasons for this long delay are beyond the scope of this study but it would be appropriate to explore the underpinning reasons for these delays in a subsequent study. The Taylor Report (2002), however, sums up the reasons for the system failing as '... (the Commissioner) failing to administer the Compensation Fund adequately...'[5]

In the 2007/2008 annual report of the Compensation Fund the Commissioner reports that there are administrative shortfalls within the Compensation Fund administration.[80] A range of challenges to the management of the Fund are listed and these included human resource challenges, ineffective technology utilisation and failure to decentralise services.

The failure of the compensation process is a health systems failure. The compensation system has failed to protect workers when they are most vulnerable (when they are injured or ill).

4.5 Limitations

The patients seen at the dermatology clinic are not representative of the industries in the catchment area of the dermatology clinic. There is, therefore, not adequate representation of the spectrum of high risk industries described in the literature. The results cannot be generalised but it does offer some insight into selected industries generating cases in the area.

There is only one dermatologist that sees patients at the NIOH dermatology clinic. Cases may thus have being misclassified. The advantage of having the same person though is that there is consistency in the criteria used to make the diagnosis of OCD.

This was a retrospective review and with a long delay between when cases were seen and the time of the study. Patients interviewed may not have been able to accurately recall the information that they were asked to provide. This may especially have been true when participants were asked to quantify the financial cost of their skin condition.

The researcher only had access to the electronic records at the Commissioner's office. The electronic records could not be verified against hard copies that this office may have received. It is thus not clear if cases submitted were received but not captured on the electronic system.

The researcher did not anticipate that such a small number of cases would be resolved. The few cases that were compensated influenced the analytical component of the study. Had

the sample size been larger it is anticipated that the multivariate analysis would have been able to better predict the factors that may have influenced finalisation of a claim.

Chapter 5 Conclusion and Recommendations

5.1 Conclusion

Vocation is an important aspect of an individual's life because it provides financial stability and offers meaning to life. The impact of occupational diseases can have far reaching consequences on workers. OCD is chronic in nature, may have a poor prognosis and has a significant impact on the psychosocial, financial and occupational dimensions of affected people.

The compensation outcome of OCD cases seen at the NIOH dermatology clinic was very poor. There were several factors that contributed to the poor outcome in this study. The two most important considerations were the failure of the employer to submit forms to the Commissioner's office, and the failure of the Commissioner to process claims efficiently. The COID Act Commissioner failed to administer the Fund effectively and to ensure that workers receive compensation for OCD as a means of protecting their income when affected by this skin disease.

The agents commonly causing OCD, the occupations workers are employed in and the industries they are from are not fully described for the catchment area for NIOH. The burden of skin disease in the workplace needs to be described more extensively.

5.2 Recommendations

5.2.1 Recommendations to the Commissioner

- The 2007/2008 Annual Report of the Compensation Fund made good recommendations to improve the services rendered by the Commissioner's office. Every effort should be made to implement these recommendations. These recommendations included improving staff recruitment and retention, decentralisation of the Commissioner's services to other provinces and introduction of electronic submission of claims. The system can be strengthened if the shortage of staff at all tiers is addressed.
- The Commissioner's office needs to address the quality of service rendered by improving customer relations.

5.2.2 Recommendations to the employer

- It is the responsibility of the employer to ensure that all documents are submitted to the Commissioner's office.
- The introduction of an electronic tracking system between the employer and the NIOH may ensure better tracking of the progress of patients.

5.2.3 Recommendations to the NIOH

- The employer needs to fill out the WCL 1 form for submission of a claim but this requirement can be circumvented if the employee completes an affidavit for submission of a claim by the NIOH to the Commissioner's office. This should be standard practice in the dermatology clinic for submission of a claim. (This

recommendation was initiated when the preliminary results of the study showed that the employer was a major bottleneck in the compensation process).

- A specific compensation officer should be identified at the Commissioner's office to liaise with and claims can be hand delivered to this officer to ensure that the claims are captured. This will ensure that there is a point person to contact for queries. (This recommendation has subsequently been implemented).
- A surveillance system should be implemented to monitor the agents and industries that are at high risk in the NIOH catchment area.
- The study should be repeated at a later stage when the number of cases seen at the dermatology clinic has increased. This will improve the power of the study and assist in determining the factors that predict compensation outcomes.

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Appendices

Appendix A

Data Capture Sheet for Medical Records Review.

Data Capture Sheet Medical Records			Code
1	Unique number		
2	Sex	Male 1☐ Female2☐	☐
3	Age	Years	
4	Occupation		☐
5	Job		☐
6	Industry		☐
7	Duration of exposure (months) to causative agent from exposure to diagnosis	mm	
8	Onset of symptoms/rash	mm yyyy	
9	When diagnosis was made	mm icy	
10	Site of rash	1.Hands 2.Face and neck 3.Both 4.Other	☐
11	Diagnosis	1.OCD 2.Irritant contact dermatitis 3.Other	☐
12	Causative agent(s)	1..... 2..... 3.....	☐ ☐ ☐
13	Were other workers affected by a similar rash?	Yes 1☐ No 2☐	☐
14	Skin patch test done?	Yes1 ☐ No 2☐	☐
15	Patch test results	1.Positive 2.Negative 3.Equivocal 4.Other	☐
16	Record of claim submitted to CC.	Yes 1☐ No 2☐	☐

Appendix B

Patient Information Sheet:

Study title: Contact Dermatitis seen at the NIOH Dermatology Clinic.

Good day my name is Dr André Rose. I am working at the National Institute for Occupational Health. I am doing follow up of patients that were seen at the skin clinic. I am trying to find out what have happened to the people that were seen at our skin clinic. I am also contacting you to ask some questions about what has happened in your work and if you have heard anything about your compensation. I will use the results of this for a study that I am doing with the University of the Witwatersrand.

I would like to ask if you would like to participate in this study by answering some questions for me. It should take about 15min of your time.

The way that this study will work is that I will ask you some questions on what has happened to you since you were diagnosed with your skin disease. I want to find out how it affected you at work and what has happened to your compensation claim.

The benefit to you is that we follow up on your compensation claim. If it has not been sorted out will try and get your claim finalised.

There will not be any disadvantage to you if you decide at any point that you do not want to join in this study. You do not have to answer any questions that you do not want to. If you decide not to join in this study you will have no disadvantage to the treatment and care that you will receive at the skin clinic.

We will keep all personal information confidential.

If you have any questions or need further information you can contact me at the NIOH on 011 712 6400. You can also call the ethics committee on 011 717 1234.

Would you like to be part of this study?

The interview will now begin.

Appendix C

Telephonic Patient Questionnaire.

	Questions	Code
1	Are you still working at the same employer as when you were first diagnosed with the skin disease? Yes **1** ☐ No **2**☐ If yes go to Q6. If no go to Q9	☐
2	Are you still exposed to the same chemical that caused the skin disease? Yes **1**☐ No **2**☐ Not sure**3**☐	☐
3	Have you changed jobs because of your skin disease? Yes **1**☐ No **2**☐	☐
4	What job are you doing now? _____	
5	What is the reason you are no longer with the same employer? 1.Medically boarded 2.Retired 3.Resigned 4.Retrenched 5.other Explain _____	☐
6	What are you doing now? 1.Unemployed 2.Self employed 3.New job 4.Working part time 5.other Explain _____	☐
7	Are you still exposed to the same chemical that caused the skin disease? Yes **1**☐ No **2**☐ Not sure**3**☐	☐
8	Did you change employers because of your skin condition? Yes **1**☐ No **2**☐ Explain:_____	☐
9	Do you feel that you have lost out on promotion opportunities because of your skin condition? Yes **1**☐ No **2**☐	☐

10	Do you feel that you have lost salary because of your skin condition? Yes **1**☐ No **2**☐	☐
11	If yes please explain.	
12	How much income have you lost each month? R_____	
13	For how many months have you lost this income? mm_____	
14	Did you have to pay for any of the treatment for your skin disease? Yes **1**☐ No **2**☐	☐
15	How much per month has this cost you? R---------- per month for ---------- months	
16	Did your skin condition affect your work performance? If so how has your skin condition affected your performance at work? Very much. **1**☐ A lot.**2** ☐ A little. **3**☐ Not at all4	☐
17	Have you made a claim for workers' compensation for your skin condition? Yes **1**☐ No **2**☐	☐
18	What was the outcome of your claim? Accepted **1** ☐ Rejected **2** ☐ Do not know **3** ☐	☐
19	If your claim was rejected do you know why the claim was rejected? Yes **1**☐ No **2**☐	☐
20	If yes please explain. _____	

21	Has the Compensation Commission contacted you about the claim? Yes **1**☐ No **2**☐ Do not know**3**☐	☐
22	What comments do you have about the compensation process?	

The interview in now over.

If you have any questions do not hesitate to call me on 011 712 6400. Thank you very much for your time.

Good bye.

Appendix D

Data capture sheet for enquiry into compensation claim.

Patient number: _____ Claim Number: _____

1	Is there a record of there a claim submitted in the medical records? Yes 1☐ No 2☐	☐
2	Contact the employer. Has a claim been submitted? Yes 1☐ No 2☐	☐
3	If yes. When was the claim submitted? dd mm yyyy	
4	If no. Why was the claim not submitted?	
5	If claim was submitted, contact Commissioner's office. Is there a record of the claim with the Commissioner's office? Yes 1☐ No 2☐	☐
6	When was the claim received? dd mm yyyy	
7	If the Commissioner has a record of the claim. Has the claim been resolved? Yes 1☐ No 2☐	☐
8	If the claim has not been resolved why is there a delay? 1.Outstanding documents. ☐ 2. Other. ☐	☐
9	The following documents were outstanding: 1.Employers report W.CL.1 2.Notice of occupational disease W.CL.14 3.First medical report W.CL.22 4.Progress report for each consultation W.CL.26 5.Dermatology report 6.Exposure history W.Cl.10	☐ ☐ ☐ ☐ ☐ ☐

	7.Results of medical rests. 8.Affidavit of employee if employer cannot be 10traced or the W.CL.1 was not submitted on time.	☐ ☐
10	The claim has been resolved. Yes 1☐ No 2☐	☐
11	Outcome of the claim: 1.accepted 2.pending 3.rejected	☐
12	If accepted. Reason:_____ If rejected. Reason:_____ If pending. Reason:_____	
13	Did the claimant receive compensation? Yes 1☐ No 2☐	☐

Appendix E

Consent form signed when patient is seen at the dermatology clinic.

NATIONAL INSTITUTE
for
OCCUPATIONAL HEALTH
Listed in Schedule 3 Part A: National Public Entities – Practice No.5200296

25 Hospital Street, Constitution Hill, JHB • PO Box 4788 Johannesburg 2000 South Africa • Tel: 27 11 712 6400 • Fax: 27 11 712 6426

CONSENT FORM: USE OF CLINICAL INFORMATION

This document must be explained to the patient by a member of the clinical staff

Dear Patient,

You are here being assessed for a possible occupational disease because of health problems you are currently experiencing. The NIOH not only assists in the assessment and management of occupational diseases (OD) but is also actively involved in conducting research aimed at improving the quality of the care we deliver and the information we have about OD in the country. This research may involve the use of patient records from which information may be extracted. The use of such information is subject to:

- Approval from a National Committee for Research on Human Subjects; and
- Anonymity: in other words the identity of the patient from whose file information is extracted is never revealed to anyone but the researcher unless specific consent is obtained from the patient to do so.

We would like to obtain your consent to use information from your file for the purpose of our research, subject to the approval and anonymity mentioned.

If you choose not to give your consent, then so doing will not compromise the current or future services you receive from NIOH in any way.

If at any time in the future, you choose to withdraw this consent, you are free to do so and this will again not prejudice the current or future service you get from NIOH in any way.

Should you wish to contact us at any stage regarding this consent, please contact the Occupational Health Sister at the following telephone number: **(011 712 6420)**

PATIENT NAME	CLINIC NUMBER

YES	I hereby give consent for my patient records to be used as per the conditions explained to me for the purposes of research.

NO	I do not give consent for such patient records to be used.

FULL NAME OF THE WITNESS (PLEASE PRINT)

SIGNATURE	DATE

Appendix F

The ethics clearance form.

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Rose

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M080410**
PROJECT	Contact Dermatitis seen at the National Institute for Occupational (NIOH) Dermatology Clinic
INVESTIGATORS	Dr A Rose
DEPARTMENT	School of Public Health
DATE CONSIDERED	08.04.25
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 08.05.20 **CHAIRPERSON** .....
(Professor P E Cleaton Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Prof D Rees

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

Appendix G

Algorithm of problems indentified in the compensation process and recommendations

Steps in the compensation process	Problem Indentified	Recommendation
Step 1 Dermatologist confirms diagnosis and completes forms for submission to the Commissioner.	• Completed forms are faxed to the Commissioner but there is often no record of the forms having been received.	• Forms are completed and delivered by hand to the Commissioner's office to a specific officer. This recommendation was implemented.
Step 2 The employer completes forms for submission to the Commissioner's office.	• The employer often does not complete the necessary forms which cause a delay in the claim being settled.	• The patients (employees) should sign an affidavit that allowing the NIOH to submit forms on their behalf without the employer being involved. • The employer should be encouraged to complete all forms and submit it to the Commissioner on time.
Step 3 Claimants are not informed of the progress of their claims.	• The Commissioner's office's communication with claimants is poor.	• The Commissioner needs to improve the communication between the office and the claimants. It needs to be proactive in providing feedback regarding the status of a claim.