Executive Summary

Occupational Disease

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Committee on Workers' Compensation

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Introduction

Background

The Canadian Institute of Actuaries (CIA) engaged Oliver Wyman Actuarial Consulting, Inc., to provide information on issues relating to the consideration and measurement of unpaid costs associated with occupational diseases generated by the cumulative physical effect of long-term exposure to repetitive activities or hazardous substances.

The purpose of this assignment is to generate sufficient information and intellectual capital on occupational diseases to allow each individual workers' compensation board (WCB) in Canada to make informed decisions as to:

1. Which occupational diseases generate claims of sufficient frequency and severity to warrant investigation of potential costs of the disease in question;
2. Whether or not the expected cost of potential claims due to the cumulative physical effect of long-term exposure to repetitive activities or hazardous substances of currently active employees should be quantified and included as part of the liability for unpaid claim costs; and
3. What actuarial approaches to use to generate reasonable estimates of unpaid costs.

Philosophies and approaches related to the items above likely vary among the individual WCBs. There is concern within the actuarial community in Canada, represented by the CIA, that sufficient information may not be currently available (or at least currently available in a single document) to the individual jurisdictions for the purpose of making informed decisions on these items. Ideally, the information presented in this report, with supporting data acquired by Oliver Wyman, will serve as the basis for decision-making that reflects the unique risk exposure, current practice, and general operating philosophy of each individual WCB in the context of common practice in the numerous jurisdictions within the U.S. as well as other parts of the world.

Definitions

For the purpose of this report, the following definitions apply:

Traumatic (Acute) Claims: Claims generated by traumatic injuries are due to specific incidents at specific points in time. Examples are amputations and fractures. Another example is claims due to bee stings suffered by beekeepers. Data acquired for this assignment classified the latter claims as "occupational disease" given that poisoning due to bee venom is an occupational hazard for beekeepers. Nevertheless, these claims (and claims generated under similar circumstances for other occupations) are due to specific incidents at specific points in time and are therefore traumatic claims for the purpose this report.

Occupational Disease: Diseases generated by the cumulative physical effect of long-term exposure to repetitive activities or environmental hazards (generally referred to as "exposure to loss" in this report). Data acquired for this assignment suggests that *long-term* refers to a minimum exposure of at least five to 10 years, extending through decades. Examples of occupational diseases are cancer and carpal tunnel syndrome. In this sense, for the purpose of this report, the definition of *occupational disease* is strict and does *not* include injuries or conditions commonly referred to as occupational but which are caused by incidents at a specific

point in time (see the above paragraph). Data suggests two general categories of occupational diseases: latent occupational diseases and non-latent occupational diseases.

Latent Occupational Disease: Latent occupational diseases generally emerge at higher ages (50s and above), often after retirement, and are due to the cumulative effect of long-term exposure to environmental hazards over the working life of an individual. Data suggests that for latent occupational diseases, exposure occurs over the course of many decades. Examples include cancer, coal worker pneumoconiosis, asbestosis, and hearing loss. Data shows that latent occupational diseases generally emerge later in life, in some cases many years (often decades) after the last date of exposure to loss.

Non-latent Occupational Disease: Non-latent occupational diseases emerge at lower ages (30s to 40s) and are due to the cumulative effect of long-term exposure to repetitive motion. Data suggests that for non-latent occupational diseases, exposure occurs over the course of five to 20 years. Examples include carpal tunnel syndrome and various inflammatory conditions of the muscular-skeletal system (bursitis, tendonitis). Non-latent occupational diseases generally emerge relatively quickly after the last date of exposure to loss, often while the employee is still working.

Latency Period: *Latency Period* refers to the time required, from first exposure to loss, for a specific disease to manifest itself in an individual. The data acquired for this assignment does not have sufficient information to precisely measure latency periods. However, the data does imply (assuming employees generally start work at the same age) that latency periods for latent occupational disease claims are materially longer, perhaps by decades, than non-latent occupational disease claims, because they emerge at much greater ages.

Active Employee: Individuals currently employed in occupations that expose them to the underlying hazards that generate occupational disease claims.

Inactive Employee: Individuals no longer exposed to underlying hazards that generate occupational disease claims. Inactive employees either have retired from the workforce or changed employment to occupations that no longer expose them to loss.

Date of Loss: The date the injury generating a claim occurred. For a traumatic claim, the date of loss is the date the injury occurred, and is unambiguous. For an occupational disease claim, the date of loss is ambiguous given that occupational diseases are due to long-term exposure to repetitive motion or hazardous substances. In practice, as respects insurance contracts and the analysis of data for determining the financial responsibility for occupational disease claims[1] and liability valuations, the most common definition is the last date of exposure to loss. For an inactive employee, the last date of exposure loss is the last date worked. For an active employee, the last date of exposure to loss is generally coincident with the date the employee filed a claim. For the purpose of this report, the date of loss is defined using this common definition.

[1] The WCBs in Canada function as monopolistic provincial agencies. Financial responsibility lies almost exclusively with the respective WCBs. In most U.S. jurisdictions, as well as jurisdictions in other countries, workers' compensation insurance is sold through a competitive marketplace and the date of loss, as respects the assignment of the financial responsibility of an occupational disease claim, is important when an employer has contracted with different insurance enterprises over time.

Reported Claim: This is a claim that has been filed with (reported to) the respective WCB.

Inactive Employee: The date of loss of a reported claim is the last date worked.

Active Employee: The date of loss of a reported claim is the date the employee files a claim, which is assumed to be (and generally is) coincident with the last date of exposure to loss.

Unreported Claim: An unreported claim has a defined date of loss, but has *not* yet been filed with (reported to) the respective WCB. *Incurred but not reported claims* (IBNR) is a common term for unreported claims.

Inactive Employee: Inactive employees generate IBNR claims the date they leave the workforce. The claims exist because exiting the workforce establishes a date of loss for any future claim due to the accumulated exposure to loss during the working life of the employee. For latent occupational disease claims, claims may remain unreported for decades, until the underlying disease manifests itself and the employee files a claim for benefits.

Active Employee: Using the definitions established for the purpose of this report, unreported occupational disease claims *do not* exist for active employees because a date of loss, as defined earlier, does not exist until an active employee files a claim or leaves the workforce. Active employees therefore have an accumulated exposure to loss with an associated liability that reflects the expected cost of potential future claims. The liability associated with active employees is referred to as the Active Employee Component, or AEC.

Report Lag (or Lag): The time difference between the date of loss (as defined above) and the date of report. Report lag is an indicator (though not a precise measure) of the degree of latency associated with a specific occupational disease. Latent occupational diseases generally have much greater lag (years to decades) than non-latent occupational diseases (zero to several years). For example, cancer often manifests itself years after the last date of exposure to loss while employees report carpal tunnel syndrome claims generally while still working.

The definitions above suggest that there are three distinct cost components of occupational disease claims:

Reported Claim Costs: The expected cost of occupational disease claims that have been reported to the respective WCBs/employers.

Unreported (IBNR) Claim Costs: The expected cost of occupational disease claims that have not been reported to the respective WCBs/employers. Unreported claim costs, or IBNR, are exclusively due to inactive employees.[2]

Active Employee Component (AEC): The expected cost of potential future claims due to the cumulative exposure to loss associated with active employees.

[2] In practice, IBNR does exist for active employees. However, the nature of active employee IBNR is fundamentally different from IBNR due to terminated employees. IBNR for active employees is almost exclusively due to delays in recording the claim into databases used for the purpose of analysis. Report lags associated with these claims are extraordinarily small, ranging for days to months. These claims are commonly referred to as "pipeline" claims. Pipeline claims are fundamentally different from IBNR claims associated with terminated employees, where claims are reported years or decades after the last exposure to loss.

Detailed Scope

Oliver Wyman was engaged to address the following items, subject to data availability:

1. Identify a superset of occupational disease claims provided for by insurance in Canada.
2. Identify a superset of cumulative trauma claims that potentially could be included in the superset of occupational disease claims.
3. Identify occupational diseases currently classified as workers' compensation claims in jurisdictions outside of Canada and not currently classified as workers' compensation claims in Canadian jurisdictions.
4. Recommend a set of occupational disease claims for which a liability potentially could be determined.
5. Identify the set of occupational disease claims using the NWISP/ICD9 coding system in Canada.
6. Recommend and discuss the following occupational disease periods for each disease in the set identified in item 4 above:
    a. Minimum exposure period required to contract the disease
    b. Average latency period from start of exposure to disease emergence
    c. Variance of exposure by industry
    d. Minimum latency period required for qualification as a latent occupational disease.
7. Identify, rank, and discuss the cost of the occupational diseases identified in item 4 above.
8. Propose and discuss potential liability calculations.
9. Illustrate potential liability calculations.
10. Identify best practices in the U.S., Canada, and other countries.
11. The final report will be the result of a collaborative effort on the part of the CIA and Oliver Wyman and will address the items listed previously as well as the following:
    a. Impact of health and safety improvements
    b. Changes to exposure levels over time
    c. Changes in average age and other demographics
    d. Improvements to mortality
    e. Improvements to disease treatment
    f. Approaches to calculated and allocated liabilities by industry
    g. Other considerations.

General Approach

The most important element of this assignment was the acquisition and subsequent compilation, examination, and analysis of data. This portion of the assignment directly addresses items 1 through 7 of the scope, and provides required information and context to address items 8 through 11. The following is an outline of this process:

Data Acquisition

Oliver Wyman and the CIA jointly approached a number of Canadian provinces to discuss the contribution of data to this assignment. Additionally, Oliver Wyman approached current clients and contacts within the U.S. The following entities contributed data to this assignment:

The Alberta Workers' Compensation Board

The Workers' Compensation Board of British Columbia (WorkSafeBC)

A competitive state fund in the U.S.

Two large U.S. ship manufacturing, repair, and servicing corporations.

Data Editing

Oliver Wyman reviewed, sorted, and tested data from each source for structure, information content, and reasonability, and removed data with little or no informational value as well as data with irrational content. Information initially acquired consisted of over 400,000 claim entries. Of this data, approximately 150,000 claim entries were used.

Data Compilation

The form and content of the final database evolved during the editing and compilation process. The approach was iterative, in the sense that the editing and compilation process gave context and background to data structure and differences in content from the various contributors. The format accommodated common available data from all sources. Additionally, the form and structure of the final database considered the need to ensure confidentiality of contributor data. The structure of the final database follows. There is a discussion of the individual data elements later in this report.

Age at Date of Loss	Claim Cost at Current Level	Secondary Disease/Injury
Age at Claim Report	Industry Group	Source of Injury
Gender	Primary Disease/Injury Category	Body Part 1
Report Lag	Primary Disease/Injury Classification	Body Part 2
	Primary Disease/Injury	

Data Analysis

Data was examined throughout the editing and compilation process to determine the key metrics that would address the CIA's needs (as described in the scope), as well as to determine the most efficient and informative way to present the selected metrics. Data volume and reasonability were key considerations.

Best Practices, Liability Calculations, and Other Issues

Oliver Wyman investigated how other jurisdictions outside North America address the liability for latent diseases. Other aspects of items 8 through 11 of the scope were developed throughout the acquisition, editing, compilation, and analysis of data. Items 8 through 11 were addressed to the degree permitted by available data.