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Health Care Cost Trends

The Impact of Diagnosis on Individual DI Recovery and Mortality Rates from 2006 through 2014 – Phase 2

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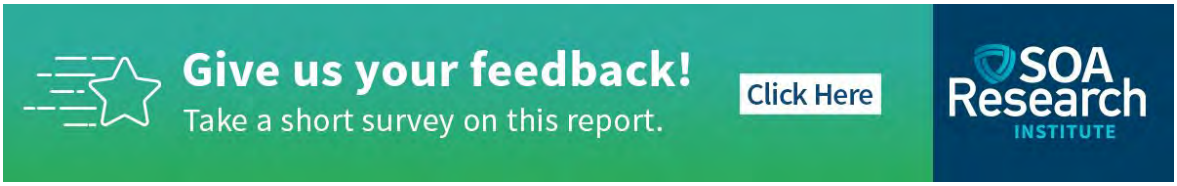
The Impact of Diagnosis on Individual DI Recovery and Mortality Rates from 2006 through 2014 – Phase 2

AUTHORS Robert W. Beal, FSA, MAAA
Retired Actuary

Thomas R. Corcoran, FSA, MAAA, ERA
Retired Actuary

SPONSOR Individual Disability Experience Committee



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Section 1 Introduction and Scope

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This study has been prepared by the Individual Disability Experience Committee (IDEC) of the Society of Actuaries Research Institute (SOA).

1.1 STUDY OBJECTIVE

The objective of the overall study, titled *The Impact of Diagnosis on Individual DI Recovery and Mortality Rates from 2006 through 2014* ("the 2024 IDEC Study"), is to analyze how individual disability income (IDI) claim recovery and mortality experience varies by diagnosis over select claim durations. The 2024 IDEC Study consisted of two phases. Phase 1 of the 2024 IDEC Study, which was published in June 2024[1], limited the scope to only claims with a 90-day elimination and To Age 65-70 benefit period. By limiting the elimination and benefit periods, Phase 1 produced a constant data set that allowed the study to focus primarily on the impact of diagnosis on IDI disabled life recovery and mortality.

This report covers Phase 2 of the 2024 IDEC Study and expands the scope to include short-term and lifetime benefit periods and 30-day, 60-day, and 180-day elimination periods, in addition to the 90-day elimination period and To Age 65-70 benefit period covered in Phase 1. Specifically, this report studies how IDI recovery and mortality experience by elimination period and benefit period vary by occupation class, diagnosis, and claim year, separately for males and females.

1.2 STUDY BACKGROUND

The 2024 IDEC Study was preceded by the following two IDEC studies of IDI claim termination rates:

- *Claim Termination Experience from 2006 to 2014, revised August 2021*[2]

  This study analyzed IDI claim termination experience from 2006 to 2014 in terms of actual-to-expected (Actual/Expected) ratios relative to the 2013 Individual Disability Income Valuation Table (2013 IDIVT). Claim termination experience was measured by contract type, calendar year, elimination period, benefit period, occupation class, onset age, sex, duration, monthly indemnity, the presence of cost-of-living adjustment (COLA) benefits, and diagnosis category. Results were presented in terms of Actual/Expected claim termination ratios, where the expected terminations were based on the claim termination rates for recovery and mortality combined from the 2013 IDIVT. For the purposes of this report, this study is referred to as the "*August 2021 IDEC Study*."

[1] https://www.soa.org/49d98d/globalassets/assets/files/resources/research-report/2024/diagnosis-impact-mort-rates-2006-2014.pdf
[2] https://www.soa.org/4a3dda/globalassets/assets/files/resources/experience-studies/2021/2021-08-update-analysis-claim-termination-report.pdf

- *2006-2014 Experience Adjustments to the 2013 IDI Valuation Table Claim Termination Rates, Revised April 2022*[3]

  This study developed claim termination rates based on experience from 2006 through 2014. Claim termination rates over the select claim durations (i.e., the first ten claim durations) during the 2006-2014 period were represented as Actual/Expected adjustment factors to be applied to the 2013 IDIVT select claim termination rates. For claim durations 11 and higher (i.e., the ultimate claim durations), a completely new set of claim termination rates was developed. This was necessary because it had become clear from the 2006-2014 data that Actual/Expected ratios against the 2013 IDIVT could not adequately capture the new experience (additional explanation is provided below). For the purposes of this report, this second study is referred to as the "*November 2021 IDEC Study*."

The 2024 IDEC Study uses the same data source for IDI claims as the August 2021 and November 2021 IDEC studies. The two prior IDEC studies did not analyze the claim termination data separately for recoveries and mortality during the select claim period. The November 2021 IDEC Study did develop claim termination rates separately for recovery and mortality for ultimate durations because the recovery and mortality termination patterns were materially different in the ultimate period. The reader should refer to the November 2021 IDEC Study report for a discussion of the development of the ultimate recovery and mortality rates.

Phase 2 of the 2024 IDEC Study studies the impact of occupation class, sex, diagnosis, elimination period, and benefit period on disabled life recovery and mortality rates. The authors recognize that claim termination rates may also vary by other factors, and analyses of these factors may be worthy topics for future IDEC studies.

1.3 STUDY SCOPE

The scope of IDI claims used in the 2024 IDEC study was limited in order to use a consistent set of claims across the variables being analyzed. This meant excluding certain categories of claims, as described below.

The data sets used in Phases 1 and 2 of the 2024 IDEC Study are defined as follows:

1. A&S policies

   Claims from non-A&S policies were excluded in both Phase 1 and Phase 2. The two most prominent non-A&S policies are Business Overhead Expense (BOE), and Disability Buy-Out (DBO). BOE policies typically have a short elimination period, e.g., 30 days, and a short benefit period, e.g., no longer than 24 months, with benefits covering business overhead expenses during disabilities. DBO policies have long elimination periods, e.g., 360 days or longer, and most DBO benefits are typically paid out as a lump sum benefit upon satisfaction of the elimination period. The differences in the typical elimination period and benefit period for BOE and DBO policies, as well as differences in other contractual benefits and definitions, could distort comparisons by diagnosis to A&S policies.

2. Benefit period

[3] https://www.soa.org/4972b7/globalassets/assets/files/resources/experience-studies/2021/2006-14-idiet-report.pdf

Phase 1 of the 2024 IDEC Study included only claims with To Age 65-70 benefit periods. The August 2021 IDEC Study analyzed how claim termination rates are affected by the length of the benefit period. Claim termination rates for claims with To Age 65-70 benefit periods, in general, are significantly higher than for claims with a lifetime benefit period and significantly lower than for claims with short-term benefit periods.

Phase 2 of the 2024 IDEC Study includes IDI claims with short-term and lifetime benefit periods in addition to claims with To Age 65-70 benefit periods in order to observe differences in recovery and mortality rates by benefit period. For the benefit period part of the Phase 2 analysis, claims are limited to those with 90-day elimination periods in order to remove the potential impact of different mixes by elimination period on recovery and mortality rates.

3. Elimination period

Phase 1 of the 2024 IDEC Study included only claims with a 90-day elimination period because elimination periods have a significant impact on termination rates, especially in early claim durations.

Phase 2 of the 2024 IDEC Study includes IDI claims with 30-day, 60-day, and 180-day elimination periods, in addition to claims with a 90-day elimination period, in order to quantify differences in recovery and mortality rates by elimination period. For the elimination period part of the Phase 2 analysis, claims are limited to those with To Age 65-70 benefit periods in order to remove the potential impact of different mixes by benefit period on recovery and mortality rates. The scope does not include claims with elimination periods under 30 days or 360+ days because of their low volumes.

4. Onset age

Both Phase 1 and Phase 2 excluded claims with onset ages 65 and over because the volume of data by diagnosis was too limited for meaningful analysis. It would not be appropriate to combine data for onset ages 65 and over with earlier onset ages because there are typically significant changes at age 65 to the benefits provided.

Before any exclusions, the IDI records in the 2006-2014 IDI Claim Database in the select claim durations, i.e., claim years 1-10, were comprised of 74,743 recoveries and 16,816 deaths. Table 1.1 shows the impact on the number of IDI recoveries and deaths in this study in Phases 1 and 2 after implementing the four claim exclusions described above.

Table 1.1
CUMULATIVE REDUCTIONS IN THE NUMBER OF RECOVERIES AND DEATHS FROM IMPLEMENTING THE FOUR CLAIM LIMITATIONS

CLAIM LIMITATIONS	CLAIM COUNT		PERCENT OF ALL RECORDS IN SELECT DURATIONS	
	Recoveries	Deaths	Recoveries	Deaths
All Records in Select	74,743	16,816	100%	100%
All Records in Phase 1	25,145	6,766	34%	40%
All Records in Phase 2	49,423	13,071	66%	78%

Phase 2 expands the scope to include more elimination periods and short-term and lifetime benefit periods. As a result, the percentage of utilized recovery records increased from 34% in Phase 1 to 66% in Phase 2. The corresponding percentages for death records increased from 40% in Phase 1 to 78% in Phase 2.

Both Phase 1 and Phase 2 of the 2024 IDEC Study present results in terms of claim count, not claim monthly indemnity. For this study, claim count is a better measurement basis because splitting the data by diagnosis often results in relatively small volumes of data in many cells. When data volumes are small, differences in monthly indemnity are more likely to distort the results.

It should be noted that, since the study period for this analysis ended in 2014, COVID has no impact on these results.

1.4 METHODOLOGY

The traditional format for IDI claim termination experience studies has been to show Actual/Expected results where the expected basis is an industry table (e.g., the 2013 IDIVT). Because the 2024 IDEC Study is the first IDI experience study to capture data on claim terminations separately for recoveries and deaths, there is no industry IDI claim termination table that separates termination rates into recovery and mortality rates. Consequently, it was necessary to adopt alternative methods for measuring IDI recovery and mortality experience in ways that would be effective in analyzing trends in the absence of industry expected tables.

1.4.1 MEASURING RECOVERY EXPERIENCE

The 2024 IDEC Study measures recovery experience using Actual/Aggregate Recovery Ratios, i.e., the ratio of actual recoveries to “aggregate” recoveries, which are derived by applying Aggregate Recovery Rates to the underlying claim exposure. The Aggregate Recovery Rates were derived by aggregating all occupation classes and non-maternity Diagnosis Groupings. They vary by sex, onset age grouping, and claim duration grouping. The male and female Aggregate Recovery Rates are provided in Section 2.

Derivation of the female Aggregate Recovery Rates excludes maternity claims because maternity recovery rates are disproportionately large relative to the recovery rates of other diagnoses for claims with onset ages under 40 and could otherwise distort the comparisons. This is particularly important in comparing recovery rates between males and females. However, recovery experience associated with maternity claims is analyzed in this study relative to the female Aggregate Recovery Rates.

The Aggregate Recovery Ratios used in Phase 1 were based on claims with a 90-day elimination period and To Age 65-70 benefit periods. Phase 2 continues to use the Phase 1 Aggregate Recovery Ratios. This

facilitates the analysis of differences in recovery experience by maintaining one set of male and female Aggregate Recovery Rates regardless of occupation class, diagnosis, elimination period, and benefit period.

It is important to note that the Aggregate Recovery Rates do not represent an "expected" recovery basis. Rather, they are used solely as a basis of normalization to compare the relative recovery experience across subsets of claims and to facilitate the comparison of recovery experience among subsets of claims.

1.4.2 MEASURING MORTALITY EXPERIENCE

For mortality experience in both Phase 1 and Phase 2 of the 2024 IDEC Study, an informative approach was chosen to compare disabled life mortality to the mortality we would expect from all IDI lives (i.e., disabled and active lives combined). For this report, we have designated that basis as "Standard." In the absence of an industry standard table based on the mortality for all IDI lives, active and disabled combined, we selected a benchmark, i.e., the 2015 Valuation Basic Table (VBT) mortality table for ordinary life insurance policies (ultimate policy durations only, smoker and nonsmoker mortality combined). The 2015 VBT mortality rates (provided in Appendix C) vary by sex and attained age of the claimants during the exposed claim years.

Our analysis suggests that the 2015 VBT is a plausible surrogate for the mortality of all IDI lives (active and disabled combined) since the disabled life mortality for claims attributable to back, injury other than back, and other musculoskeletal diagnoses produce Actual/Standard Mortality Ratios that are close to 100%. In general, these three diagnoses are not associated with life threatening conditions. The 2015 VBT was also used as the mortality standard for the November 2021 IDEC Study of ultimate duration claim mortality, so consistency between studies was also a consideration.

1.5 REPORT ORGANIZATION

Section 1 Introduction and Scope

This section describes the objective, scope, and methodology of the 2024 IDEC Study, the limits placed on its scope, and the methodology used by the study.

Section 2 Study Variables and Values

This section describes the claim variables and values upon which this study focuses.

Section 3 Summary of Key Results and Observations

This section highlights key results from Sections 4, 5, and 6. At the end of Section 3, some observations on potential impact of these study results on future IDEC studies are provided.

Section 4 Disabled Life Recovery Experience by Benefit Period

This section discusses how IDI disabled life recovery experience by benefit period varies by occupation class, diagnosis, and claim duration, separately for males and females. Actual recoveries are compared to aggregate recoveries based on Aggregate Recovery Rates.

Section 5 Disabled Life Recovery Experience by Elimination Period

This section discusses how IDI disabled life recovery experience by elimination period varies by occupation class, diagnosis, and claim year, separately for males and females. Actual recoveries are compared to aggregate recoveries based on Aggregate Recovery Rates.

Section 6 Disabled Life Mortality Experience by Benefit Period

This section discusses how IDI disabled life mortality experience by benefit period varies by class, diagnosis, and claim year, separately for males and females. Actual deaths are compared to "Standard" deaths, which are derived by applying the 2015 VBT ultimate mortality rates to claim exposure.

Section 7 Disabled Life Mortality Experience by Elimination Period

This section discusses how IDI disabled life mortality experience by elimination period varies by occupation class, diagnosis, and claim year, separately for males and females. Actual deaths are compared to "Standard" deaths.

Section 8 Acknowledgements

Appendix A Definition of Diagnosis Groupings

Appendix A lists the ICD-9 codes that comprise the 15 Diagnosis Groupings, along with samples of the conditions that fall within each Diagnosis Grouping.

Appendix B Aggregate Recovery Ratios by Onset Age and Claim Duration

Appendix B shows the Aggregate Recovery Ratios used to measure recovery experience in Sections 4 and 6. These Aggregate Recovery Ratios were developed in Phase 1 and are based on claims with a 90-day elimination period and To Age 65-70 benefit periods.

Appendix C Mortality Rates in the Ultimate Policy Years from the 2015 Valuation Basic Table

Appendix C lists the male and female annual mortality rates per 1,000 that are used as the "Standard" mortality rates described above and presented in Sections 5 and 7.

1.6 SUPPORTING DATABASE

The authors have prepared an Excel database that contains the claim exposure, actual deaths, standard deaths, actual recoveries, aggregate recoveries for all combinations of elimination period, benefit period, benefit amount, sex, occupation class, Diagnosis Grouping, and claim year contained in this study. The database will allow interested readers to derive Actual/Aggregate Recovery Ratios and Actual/Standard Mortality Ratios (defined in Section 2) for any combination of the variables, including combinations not specifically presented in this report. This database is available along with the Phase 2 report from the Society of Actuaries Research Institute.

Section 2 Study Variables and Values

This section defines the study values and variables in the following subsections:

- Definitions of Study Variables
- Definitions of Study Values for Recovery Experience
- Definitions of Study Values for Mortality Experience

2.1 DEFINITIONS OF STUDY VARIABLES

The 2024 IDEC Study utilizes the same claim database used in the August 2021 and November 2021 IDEC Studies. The range of claims in this study have been limited in order to maintain a more homogenous set across both recovery and mortality experience.

The following parameters are utilized in this study:

- Claim duration groupings: Year 1, Years 2-6, and 7-10
- Onset age groupings: Under 40, 40-49, 50-59, and 60-64
- Sex: male, female
- IDEC occupation classes: M, 1, and 2-4
- Elimination periods: 30-day, 60-day, 90-day, and 180-day
- Benefit period: short-term, To Age 65-70, and lifetime
- Diagnoses Groupings: described in Appendix A

2.1.1 OCCUPATION CLASSES

There are five IDEC occupation classes, which are defined as follows:

- Class M—All medical occupations, e.g., doctors, surgeons, dentists, nurses, podiatrists, veterinarians, psychologists, psychiatrists, pharmacists
- Class 1—All nonmedical white-collar and professional occupations
- Class 2—Skilled labor and most sales-related occupations
- Class 3—Blue-collar occupations with light manual duties
- Class 4—Blue-collar occupations with heavy manual duties

The August 2021 IDEC Study listed the specific occupations comprising the five IDEC occupation classes in the claim database. However, note that there are variations among data contributors as to the specific occupations that they assign to each IDEC occupation class.

Table 2.1 shows the distribution of claim exposure by claim count for the A&S claims in this study during the select claim durations by the IDEC occupation classes. Claim exposure measures the time period that claims are exposed within the study. Male and female claims are combined in the table.

Table 2.1
DISTRIBUTION OF CLAIM EXPOSURE BY COUNT IN CLAIM DURATIONS 1-10 FOR EACH OF THE IDEC OCCUPATION CLASSES FOR A&S CLAIMS IN THIS STUDY

IDEC OCCUPATION CLASS	PERCENTAGE OF CLAIM EXPOSURE
M	41.6%
1	47.9%
2	10.0%
3	0.4%
4	0.0%
All	**100.0%**

Claims in occupation classes 3 and 4 comprise less than 0.5% of the total claim exposure. For this study, occupation classes 2, 3 and 4 have been combined into one segment labeled "2-4." Claim exposure in this combined occupation segment is attributable mostly to occupation class 2. For simplicity, the report refers to occupation class 2-4 as one class, although it is comprised of IDEC occupation classes 2, 3 and 4.

This study documents how recovery and mortality experience vary by occupation class, among other variables. The distribution of claim exposure by occupation class varies to some extent among the different elimination and benefit periods. For example, occupation class 2-4 has a higher representation among short-term claims and lifetime claims. The authors considered introducing a method of normalizing the distributions by occupation class when experience for all occupation classes combined was studied. However, it was concluded that the impact on results of such normalization was not significant enough to justify the additional complexity. The authors believe that none of the observations made in this report would change if normalization were used.

2.1.2 DIAGNOSIS GROUPINGS

This study focuses on the impact of diagnosis on claim recovery and mortality rates. Appendix A lists the 15 Diagnosis Groupings along with their ICD-9 codes and samples of the types of conditions falling within each Diagnosis Grouping.

For this study, the 15 Diagnosis Groupings have been assigned to four categories for the purpose of summarizing claim recovery and mortality differences among key subsets of claims. Table 2.2 shows the assignment of the Diagnosis Groupings into the four categories. The "Other" Diagnosis Grouping combines certain low frequency Diagnosis Groupings, i.e., diabetes, digestive, respiratory, ill-defined & miscellaneous conditions, and infectious diseases.

Table 2.2
ASSIGNMENT OF DIAGNOSIS GROUPINGS INTO CATEGORIES

CATEGORY	DIAGNOSIS GROUPING
Physical Claims	Back
	Injury other than back
	Other musculoskeletal
MNAD Claims	Mental & nervous (MN)
	Alcohol & drug (AD)
Non-Physical & Non-MNAD Claims	Cancer
	Circulatory
	Nervous system
	Other*
Maternity Claims	Maternity

* Diabetes, Digestive, Respiratory, Ill-defined & Miscellaneous Conditions, and Infectious Diseases

These categories are different than the five 2013 IDIVT categories, i.e., Very High, High, Medium, Low, and Very Low, which were the result of combining Diagnosis Groupings with similar aggregate claim termination rate levels for the purpose of valuing claim reserves. The prior categories no longer work well when terminations are split between deaths and recoveries.

2.2 DEFINITIONS OF STUDY VALUES FOR RECOVERY EXPERIENCE

2.2.1 MONTHLY CLAIM EXPOSURE AND AVERAGE MONTHLY RECOVERY RATES

Claim months are measured from the beginning of the elimination period. Claim exposure in a claim year represents the number of months that a claim is open during that year. No claim exposure is included in the study prior to the end of the elimination period. For example, the earliest claim month to be included in the study for a claim with a 90-day elimination period is the fourth month. In this example, the claim exposure in months 1-3 is not included in the study.

The monthly claim exposures for all claims in the 2024 IDEC study are unchanged from the two prior IDEC studies; they all use the 2006-2014 IDI Claims Database.

The average monthly recovery rate in a specific claim year for a subset of claims is the total number of recoveries in that claim year divided by the total monthly claim exposure.

2.2.2 AGGREGATE MONTHLY RECOVERY RATES

Aggregate Recovery Rates are the average monthly recovery rate when all occupation classes and non-maternity Diagnosis Groupings are combined. They vary by sex, onset age grouping, and claim year (1-10). Only claims with a 90-day elimination period and To Age 65-70 benefit period were used to derive the Aggregate Recovery Rates. The calculation of the female Aggregate Recovery Rates excludes maternity claims because maternity recovery rates are exceptionally large relative to other female recovery rates. The inclusion of maternity claims could otherwise distort comparisons, particularly in the younger onset ages.

The male and female Aggregate Recovery Rates are provided in Appendix B. They are presented as the average monthly recovery rate per 1,000 for each onset age grouping and claim year (1-10).

It is important to note that Aggregate Recovery Rates do not represent an “expected” basis. Rather, they are used solely as a basis of normalization to compare the relative recovery experience across Diagnosis Groupings.

2.2.3 ACTUAL/AGGREGATE RECOVERY RATIOS

Sections 4 and 5 discuss differences in recovery experience by utilizing Actual/Aggregate Recovery Ratios, which are derived by dividing the observed, or "actual," number of recoveries for a subset of claims by their "aggregate" number of recoveries. The aggregate number of recoveries is derived by multiplying the annual claim exposure in years one through ten by the Aggregate Recovery Rates that reflect the sex, onset age grouping and claim year.

In the Sections 4 and 5 tables, the Actual/Aggregate Recovery Ratio for any cell having less than five actual recoveries is left blank.

2.3 DEFINITIONS OF STUDY VALUES FOR MORTALITY EXPERIENCE

2.3.1 STANDARD MORTALITY

For the 2024 IDEC Study, the authors thought it would be informative to compare disabled life mortality to the mortality that might be expected from all IDI lives (i.e., disabled and active lives combined). That basis has been designated as "Standard." In the absence of an industry standard mortality table representing all IDI life mortality, the 2015 Valuation Basic Table (2015 VBT) mortality table was selected for ordinary life insurance policies in their ultimate policy durations only, smoker and nonsmoker mortality combined as a reasonable benchmark. The authors believe the results of this study appear to validate this choice since the overall Actual/Standard Mortality Ratio for all physical claims (i.e., back, injury other than back, and other musculoskeletal) is close to 100%. The 2015 VBT ultimate mortality rates used in the derivation of Standard deaths are provided in Appendix C.

The number of Standard deaths for any cell is derived by multiplying the cell's claim exposure separated into attained age groupings (under 25, 25-29, 30-34, 35-39, …, 60-64) by the 2015 VBT mortality rates (divided by 12 to get monthly rates) at pivotal ages 22, 27, 32, 37, …, 62.

2.3.2 ACTUAL/STANDARD MORTALITY RATIO

Sections 6 and 7 utilize Actual/Standard Mortality Ratios to compare observed, or "actual," disabled life deaths to Standard deaths. The Actual/Standard Mortality Ratio is not shown in any table for a cell having less than five actual deaths.

Section 3 Summary of Key Results and Observations

This study expands the scope of the Phase 1 study of IDI recovery and mortality experience to include short-term and lifetime benefit periods in addition to To Age 65-70, and 30-day, 60-day, and 180-day elimination periods in addition to 90-day. The study explores the impact of occupation class, diagnosis, and claim year on recovery and mortality rates, separately by sex.

Section 3 has the following subsections:

3.1 Disabled Life Recovery Experience by Benefit Period
3.2 Disabled Life Recovery Experience by Elimination Period
3.3 Disabled Life Mortality Experience by Benefit Period
3.4 Disabled Life Mortality Experience by Elimination Period

3.1 DISABLED LIFE RECOVERY EXPERIENCE BY BENEFIT PERIOD

This subsection presents key results from Section 4. When studying the differences in recovery experience by benefit period, the claim exposure has generally been limited to the first six claim years because the maximum benefit periods of short-term claims seldom exceed five years. (When the elimination period is added to a 5-year benefit period, the claim exposure ends in the sixth claim year.) An exception to this is when studying experience by claim year, where a comparison of recovery experience in years 7-10 is shown for claims with To Age 65-70 and lifetime benefit periods (but not short-term benefit periods).

Table 3.1 compares male and female Actual/Aggregate Recovery Ratios by occupation class and benefit period. Maternity claims are excluded from Table 3.1 but are shown separately in Table 3.2. Aggregate Recovery Rates, discussed in Section 2, represent the average monthly male and female recovery rates for claims with a 90-day elimination period and To Age 65-70 benefit period, varying by onset age and claim year, with all non-maternity Diagnosis Groupings and all occupation classes combined.

Table 3.1
MALE AND FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS FOR NON-MATERNITY CLAIMS BY OCCUPATION CLASS AND BENEFIT PERIOD - CLAIM YEARS 1-6 COMBINED

Occupation Class	MALE				FEMALE			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	156%	102%	86%	**101%**	149%	105%	90%	**105%**
1	140%	94%	81%	**97%**	126%	93%	82%	**96%**
2-4	185%	116%	96%	**145%**	138%	108%	108%	**119%**
Total	**166%**	**100%**	**85%**	**106%**	**136%**	**100%**	**88%**	**103%**

On average, the male short-term recovery ratios are 66% higher than the corresponding To Age 65-70 recovery ratios, while female short-term recovery ratios are 36% higher. The male lifetime recovery ratios are 15% lower than the corresponding To Age 65-70 recovery ratios, and female lifetime recovery rates are 12% lower. On average, occupation class 2-4 has the highest non-maternity recovery ratios, and occupation class 1 has the lowest among the three occupation classes.

Table 3.2

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS FOR MATERNITY CLAIMS BY OCCUPATION CLASS AND BENEFIT PERIOD - CLAIM YEARS 1-6 COMBINED

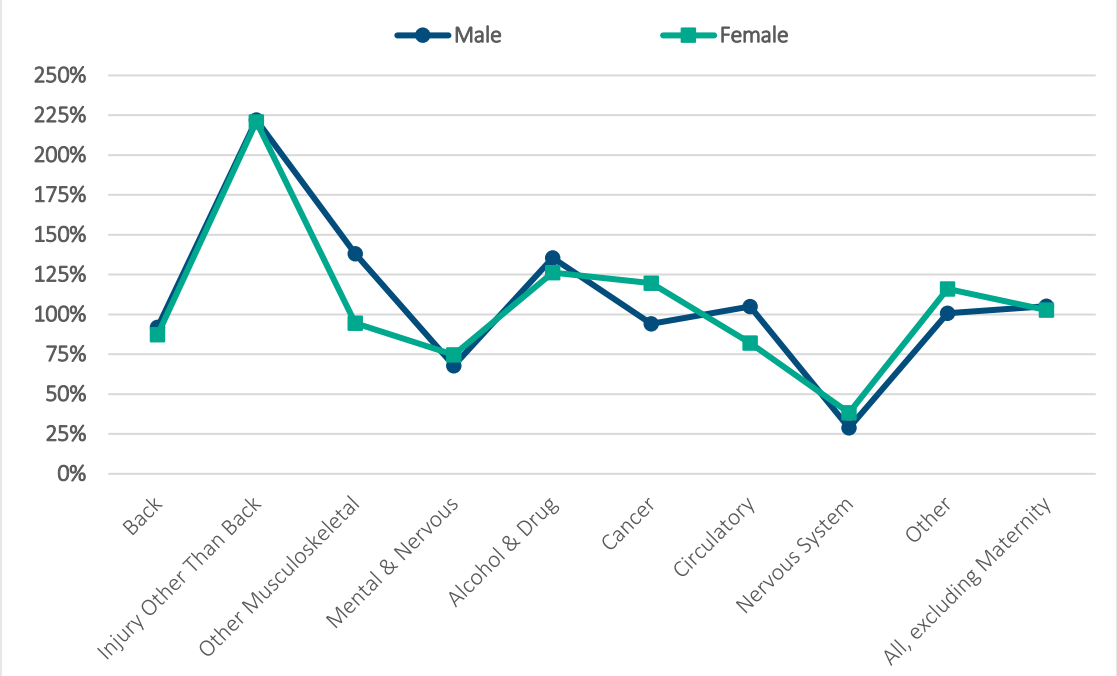
Occupation Class	FEMALE			
	Short-Term	To Age 65-70	Lifetime	Total
M	479%	489%	526%	**495%**
1	483%	533%	663%	**531%**
2-4	478%	361%		**397%**
Total	**480%**	**490%**	**527%**	**494%**

The overall maternity recovery ratios are fairly close to 500% for all three benefit periods when the three occupation classes are combined.

Figure 3.1 compares the male and female Actual/Aggregate Recovery Ratios by Diagnosis Grouping when all benefit periods and occupation classes are combined. In general, males and females have similar patterns in their recovery ratios by Diagnosis Grouping.

Figure 3.1

MALE AND FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS BY DIAGNOSIS GROUPING



Figures 3.2 (male) and 3.3 (female) show how male and female Actual/Aggregate Recovery Ratios vary by diagnosis and benefit period over claim years 1-6. All occupation classes are combined.

Figure 3.2

MALE ACTUAL/AGGREGATE RECOVERY RATIOS BY DIAGNOSIS GROUPING AND BENEFIT PERIOD - CLAIM YEARS 1-6

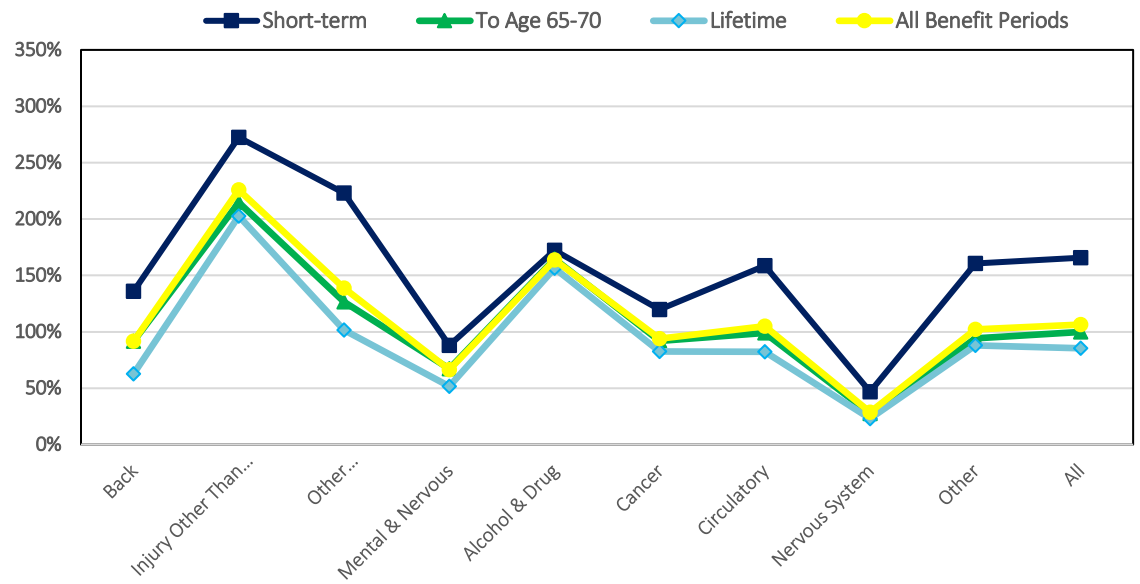
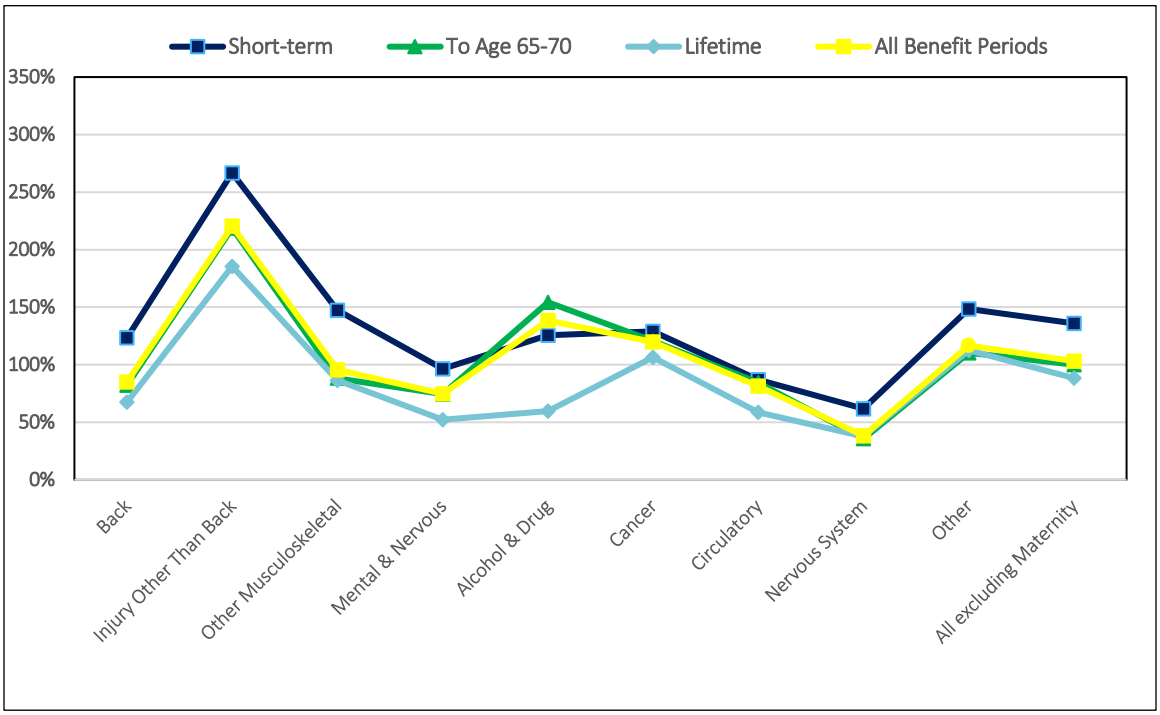


Figure 3.3

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS BY DIAGNOSIS GROUPING AND BENEFIT PERIOD - CLAIM YEARS 1-6



The short-term benefit period has the highest recovery ratios in all Diagnosis Groupings and the lifetime benefit period has the lowest recovery ratios for both males and females. The recovery ratios for cancer and nervous system claims are much closer by benefit period than the recovery ratios for the other diagnoses.

Table 3.3 compares the Actual/Aggregate Recovery Ratios by claim year and benefit period for all non-maternity claims combined. All occupation classes have been combined.

Table 3.3

MALE AND FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS FOR NON-MATERNITY CLAIMS BY CLAIM YEAR AND BENEFIT PERIOD – ALL OCCUPATION CLASSES COMBINED

Claim Year	MALE				FEMALE			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	163%	100%	93%	**108%**	126%	100%	91%	**102%**
Years 2-6	175%	100%	71%	**103%**	162%	100%	84%	**104%**
Years 7-10		100%	102%	**101%**		100%	96%	**99%**

In claim years 1 and 2-6 with all non-maternity Diagnosis Groupings combined, the short-term benefit period has the highest recovery ratios, and the lifetime recovery ratios have the lowest. In claim years 7-10, the lifetime recovery ratios are much closer to the To Age 65-70 recovery ratios for both males and females.

3.2 DISABLED LIFE RECOVERY EXPERIENCE BY ELIMINATION PERIOD

This subsection presents key results from Section 5. The analysis of recovery experience by elimination period covers claim years 1-10 since all IDI claims in this analysis have To Age 65-70 benefit periods.

Table 3.3 compares male and female Actual/Aggregate Recovery Ratios by occupation class and elimination period. Maternity claims are not included in Table 3.3 but are shown separately in Table 3.4.

Table 3.4

MALE AND FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS FOR NON-MATERNITY CLAIMS BY OCCUPATION CLASS AND ELIMINATION PERIOD - CLAIM YEARS 1-10 COMBINED

Occupation Class	MALE					FEMALE				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	196%	123%	102%	69%	**108%**	271%	165%	105%	71%	**117%**
1	174%	112%	95%	60%	**98%**	226%	134%	94%	65%	**101%**
2-4	243%	133%	116%	68%	**129%**	266%	154%	108%	84%	**119%**
All	**194%**	**119%**	**100%**	**63%**	**106%**	**247%**	**149%**	**100%**	**69%**	**109%**

In all three occupation classes, the Actual/Aggregate Recovery Ratios for the non-maternity Diagnosis Groupings decrease as the elimination periods increase. Recovery ratios for the 180-day elimination period tend to converge across the three occupation classes.

Table 3.5

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS FOR MATERNITY CLAIMS BY OCCUPATION CLASS AND ELIMINATION PERIOD - CLAIM YEARS 1-10 COMBINED

Occupation Class	FEMALE				
	30-Day	60-Day	90-Day	180-Day	Total
M	566%	392%	489%	359%	**485%**
1	825%	414%	532%	798%	**542%**
2-4	575%		365%	555%	**385%**
All	**705%**	**408%**	**490%**	**495%**	**491%**

The overall maternity recovery ratios are close to 500%, but do not show any noticeable increasing or decreasing trends by elimination period as observed in the non-maternity claims in Table 3.3.

Figures 3.4 (Male) and 3.5 (female) illustrate how male and female Actual/Aggregate Recovery Ratios vary by diagnosis and elimination period over claim years 1-10. All occupation classes are combined.

Figure 3.4

MALE ACTUAL/AGGREGATE RECOVERY RATIOS BY DIAGNOSIS GROUPING AND ELIMINATION PERIOD - CLAIM YEARS 1-10 COMBINED

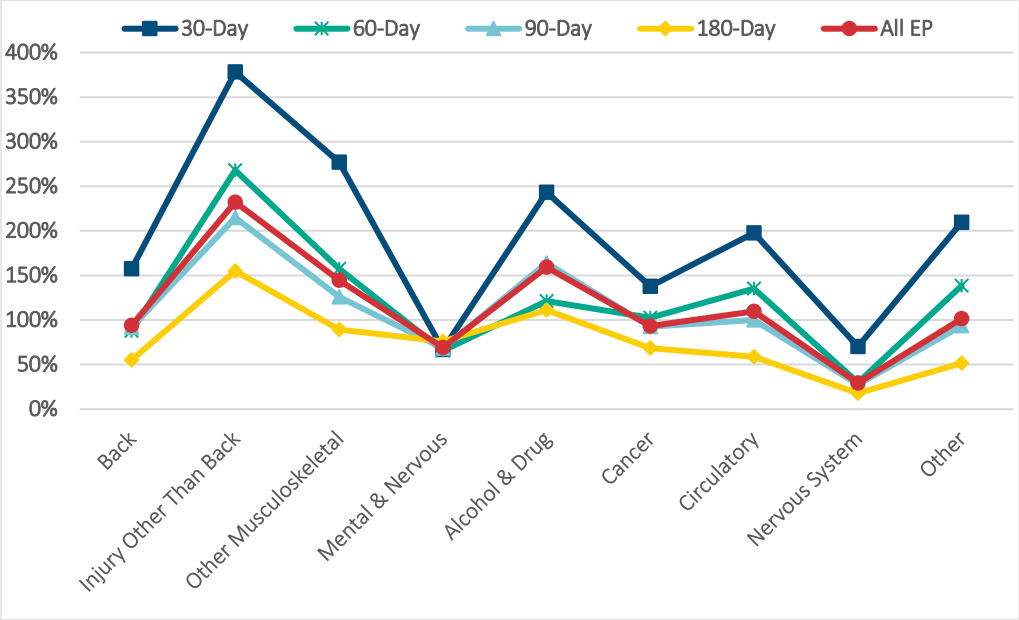
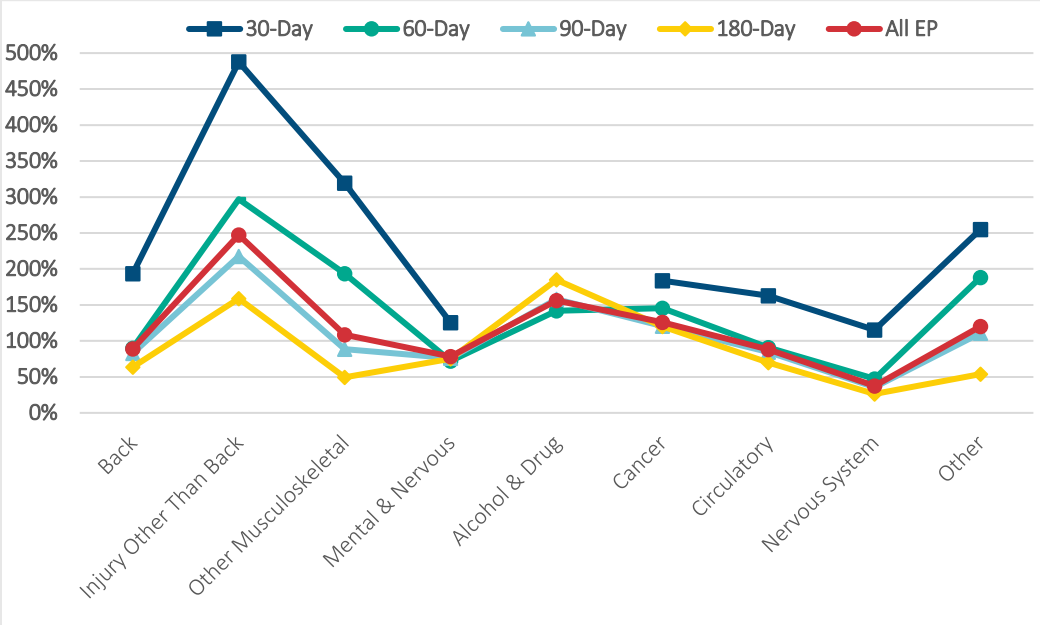


Figure 3.5

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS BY NON-MATERNITY DIAGNOSIS GROUPING AND ELIMINATION PERIOD - CLAIM YEARS 1-10 COMBINED



The male and female recovery ratios by Diagnosis Grouping generally decrease as the elimination periods increase. The 180-day elimination period has the lowest recovery ratios for all of the diagnoses. The male recovery ratios for the four elimination periods and female recovery ratios for elimination periods exceeding 30 days converge for mental & nervous claims.

Table 3.6 compares the Actual/Aggregate Recovery Ratios by claim year and elimination period for all non-maternity claims combined. All occupation classes have been combined.

Table 3.6

MALE AND FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS FOR NON-MATERNITY CLAIMS BY OCCUPATION CLASS AND ELIMINATION PERIOD - ALL OCCUPATION CLASSES COMBINED

Claim Year	MALE					FEMALE				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	228%	131%	100%	54%	**111%**	290%	169%	100%	62%	**117%**
Years 2-6	105%	94%	100%	71%	**95%**	120%	107%	100%	76%	**97%**
Years 7-10	88%	97%	100%	93%	**98%**	80%	80%	100%	59%	**90%**

In claim years 1 and 2-6, the recovery ratios for both males and females generally decrease as the elimination periods increase. For males in years 7-10, the recovery ratios for elimination periods greater than 30 days tend to converge. This convergence of recovery ratios in years 7-10 does not occur for females.

3.3 DISABLED LIFE MORTALITY EXPERIENCE BY BENEFIT PERIOD

This subsection presents key results from Section 6. Similar to the analysis of recovery experience by benefit period, the analysis of mortality experience by benefit period is limited, for the most part, to claim years 1-6.

Table 3.7 compares the male and female Actual/Standard Mortality Ratios by occupation class and benefit period when all non-maternity Diagnosis Groupings are combined. Maternity has been excluded from the mortality analysis because there are only a few related maternity deaths. As discussed in Section 2, Standard mortality rates are based on the 2015 VBT in the ultimate policy years.

Table 3.7

MALE AND FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD, ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Occupation Class	MALE				FEMALE			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	660%	735%	526%	**665%**	987%	774%	779%	**792%**
1	1188%	1095%	817%	**1065%**	1216%	1307%	969%	**1255%**
2-4	1001%	889%	458%	**902%**	1011%	1041%	890%	**1027%**
All	**996%**	**931%**	**615%**	**874%**	**1104%**	**1068%**	**854%**	**1041%**

Occupation class M has the lowest mortality among the three occupation classes for each benefit period. The mortality associated with lifetime claims is significantly lower than the mortality for short-term and To Age 65-70 claims.

Table 3.8 compares the Actual/Standard Mortality Ratios for cancer and non-cancer claims for all occupation classes combined.

Table 3.8

MALE AND FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY BENEFIT PERIOD, CANCER, NON-CANCER, ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

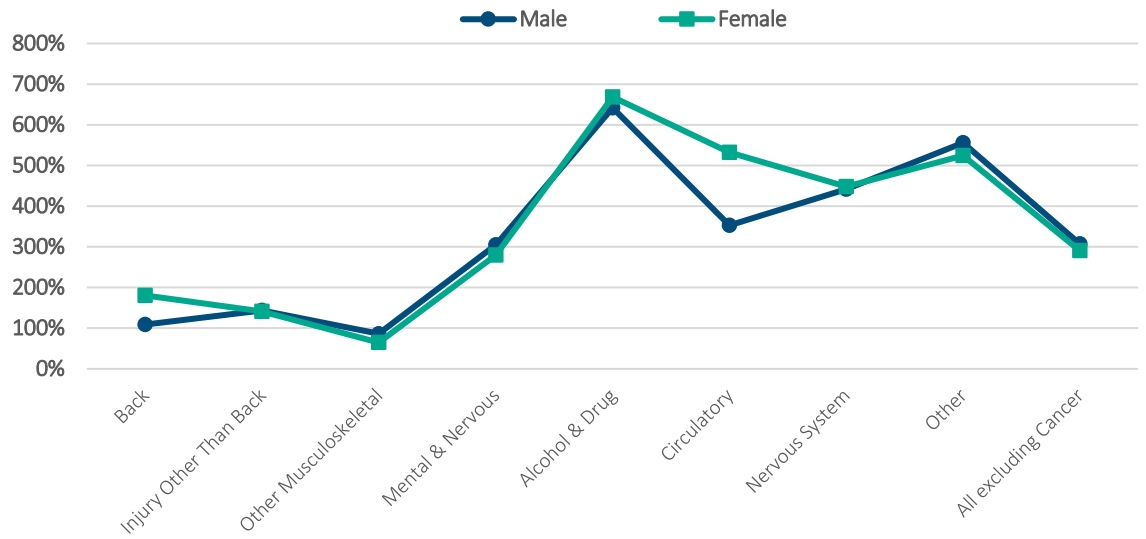
Diagnosis	MALE				FEMALE			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Cancer	5861%	5401%	4814%	**5371%**	6347%	5810%	4453%	**5667%**
Non-Cancer	361%	319%	238%	**307%**	321%	292%	257%	**290%**
All	**996%**	**931%**	**615%**	**874%**	**1104%**	**1068%**	**854%**	**1041%**

Cancer has the highest mortality by far among all Diagnosis Groups. Cancer deaths represent 69% of all male and 76% of all female IDI disabled life deaths. Differences by occupation class are provided in Section 6. Cancer mortality is over 17 times non-cancer mortality for males and 19 times for females. When all occupation classes are combined, the short-term benefit period has the highest cancer mortality ratios of the three benefit periods, while lifetime has the lowest cancer mortality ratios. Similarly, the short-term benefit period has the highest non-cancer mortality ratios of the three benefit periods, while lifetime has the lowest non-cancer mortality ratios.

Figure 3.6 compares Actual/Standard Mortality Ratios by Diagnosis Grouping for males and females for claim years 1-6 and all benefit periods combined. Cancer has been excluded because its large mortality ratios distort the relative results from the other Diagnosis Groupings.

Figure 3.6

MALE AND FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY DIAGNOSIS GROUPING - CLAIM YEARS 1-6

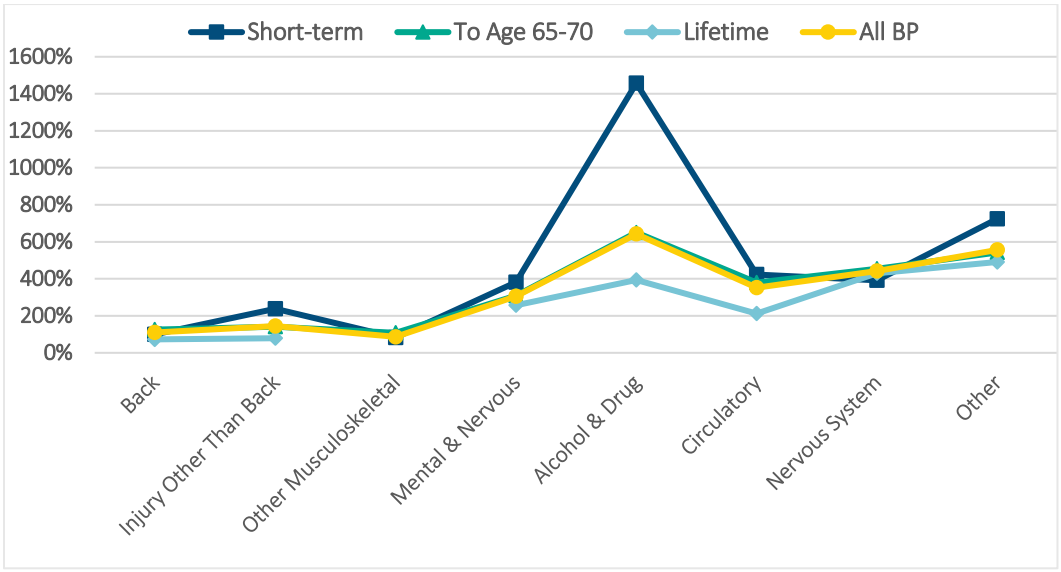


For both males and females, back, injury other than back, and other musculoskeletal have the lowest mortality while alcohol & drug has the highest mortality among the non-cancer diagnoses.

Figures 3.7 (male) and 3.8 (female) compare the Actual/Standard Mortality Ratios by Diagnosis Grouping and benefit period.

Figure 3.7

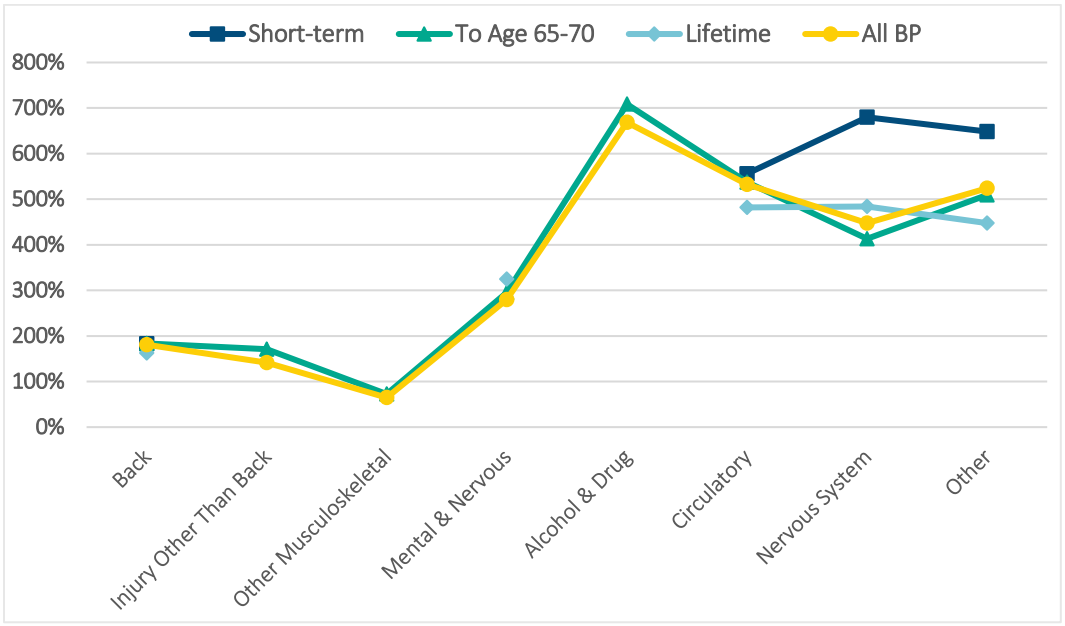
MALE ACTUAL/STANDARD MORTALITY RATIOS BY DIAGNOSIS GROUPING AND BENEFIT PERIOD - CLAIM YEARS 1-6



In general, the male short-term mortality ratios in Figure 3.6 are the highest for all of the Diagnosis Groupings while the lifetime mortality ratios are the lowest. Back, injury other than back, and other musculoskeletal have the lowest mortality ratios among the Diagnosis Groupings. Alcohol & drug and nervous system have the highest mortality ratios among the non-cancer diagnoses. The male mortality ratios when all benefit periods are combined follow the To Age 65-70 quite closely.

Figure 3.8

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY DIAGNOSIS GROUPING AND BENEFIT PERIOD - CLAIM YEARS 1-6



The low volume of female deaths relative to male deaths means more cells are left blank because they have fewer than five deaths. Regardless, for circulatory and other diagnoses, the short-term mortality ratios are highest and lifetime mortality ratios are lowest. The female mortality ratios when all benefit periods combined follow the To Age 65-70 quite closely.

Table 3.9 compares the Actual/Standard Mortality Ratios by claim year and benefit period for all non-maternity claims combined. All occupation classes have been combined.

Table 3.9

MALE AND FEMALE ACTUAL/STANDARD RATIOS FOR NON-MATERNITY CLAIMS BY CLAIM YEAR AND BENEFIT PERIOD – ALL OCCUPATION CLASSES COMBINED

Claim Year	MALE				FEMALE			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	1469%	1710%	1280%	**1596%**	1650%	1860%	928%	**1696%**
Years 2-6	815%	747%	489%	**699%**	913%	890%	838%	**885%**
Years 7-10		281%	187%	**248%**		373%	222%	**340%**

The mortality ratios are highest in year 1 and decrease significantly by claim year. In all three of the claim year groupings in Table 3.8, the lifetime mortality ratios are the lowest among the three benefit periods.

3.4 DISABLED LIFE MORTALITY EXPERIENCE BY ELIMINATION PERIOD

This subsection presents key results from Section 7. Similar to the analysis of recovery experience by elimination period, the analysis of mortality experience by benefit period covers claim years 1-10.

Table 3.10 compares the male and female Actual/Standard Mortality Ratios by occupation class and elimination period when all non-maternity Diagnosis Groupings are combined. Maternity has been excluded.

Table 3.10

MALE AND FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD, ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-10

Occupation Class	MALE					FEMALE				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	426%	492%	563%	608%	**546%**	613%	641%	631%	683%	**635%**
1	616%	612%	881%	903%	**827%**	710%	784%	1012%	1045%	**974%**
2-4	560%	569%	744%	711%	**686%**	410%	745%	803%	941%	**795%**
Total	**553%**	**559%**	**739%**	**823%**	**711%**	**638%**	**723%**	**839%**	**970%**	**835%**

The mortality ratios when all non-maternity Diagnosis Groupings are combined increase as elimination periods increase. This is generally observed in all three occupation classes.

Table 3.11 compares the Actual/Standard Mortality Ratios for cancer and non-cancer claims for all occupation classes combined. Differences by occupation class are provided in Section 6.

Table 3.11

MALE AND FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY ELIMINATION PERIOD, CANCER, NON-CANCER, AND ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-10

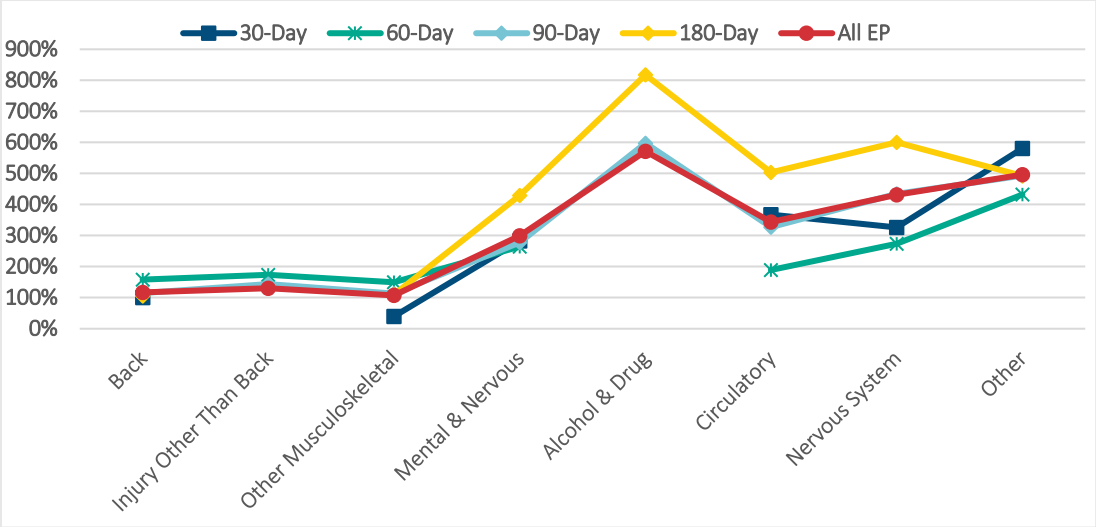
Diagnosis	MALE					FEMALE				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Cancer	3616%	3448%	4594%	5050%	**4435%**	4973%	5401%	4980%	6540%	**5262%**
Non-Cancer	271%	243%	294%	402%	**303%**	273%	218%	283%	403%	**298%**
All	**553%**	**559%**	**739%**	**823%**	**711%**	**638%**	**723%**	**839%**	**970%**	**835%**

The male cancer mortality ratios increase as the elimination period increases. The female cancer ratios do not have a similar increasing pattern of mortality ratios. The 180-day elimination period has the highest mortality ratio for cancer and non-cancer.

Figures 3.9 (male) and 3.10 (female) compare the Actual/Standard Mortality Ratios by Diagnosis Grouping and elimination periods, over claim years 1-10.

Figure 3.9

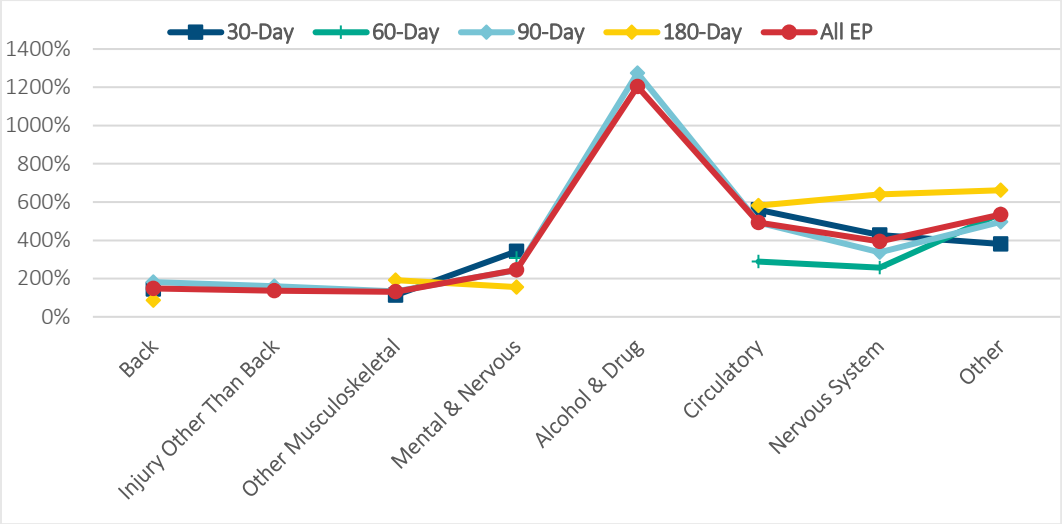
MALE ACTUAL/STANDARD MORTALITY RATIOS BY DIAGNOSIS GROUPING AND ELIMINATION PERIOD - CLAIM YEARS 1-10



The male physical Diagnosis Groupings (back, injury other than back, and other musculoskeletal) have the lowest mortality ratios, and alcohol & drug has the highest mortality ratio among the non-cancer Diagnosis Groupings shown in Figure 3.9. The high mortality associated with the 180-day elimination period is evident among the non-physical diagnoses.

Figure 3.10

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY DIAGNOSIS GROUPING AND ELIMINATION PERIOD - CLAIM YEARS 1-10



Similar to males, the female back, injury other than back, and other musculoskeletal have the lowest mortality ratios, and alcohol & drug has the highest mortality ratio among the non-cancer diagnoses shown in Figure 3.10. The high mortality associated with the 180-day elimination period is evident among the circulatory, nervous system, and other diagnoses.

Table 3.12 compares the Actual/Standard Mortality Ratios by claim year and elimination period for all non-maternity claims combined. All occupation classes have been combined.

Table 3.12

MALE AND FEMALE ACTUAL/STANDARD MORTALITY RATIOS FOR NON-MATERNITY CLAIMS BY CLAIM YEAR AND ELIMINATION PERIOD – ALL OCCUPATION CLASSES COMBINED

Claim Year	MALE					FEMALE				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	1224%	1260%	1710%	1956%	**1607%**	721%	1273%	1860%	2518%	**1735%**
Years 2-6	517%	601%	747%	933%	**739%**	902%	858%	890%	1065%	**924%**
Years 7-10	250%	162%	281%	332%	**272%**	215%	320%	373%	414%	**361%**

With one exception, the mortality ratios by claim year decrease significantly by claim year for all elimination periods. The one exception is females with the 30-day elimination period where the mortality ratio in year 1 is lower than in years 2-6. The 180-day elimination period has the highest mortality ratios in all claim year groupings among all elimination periods.

Section 4 Disabled Life Recovery Experience by Benefit Period

Section 4 discusses how IDI disabled life recovery experience varies by benefit period relative to occupation class, diagnosis, and claim year, separately for males and females. The benefit period groupings are short-term, To Age 65-70, and lifetime. All recovery experience discussed in Section 4 is based on claims with a 90-day elimination period.

Actual recoveries are compared to "aggregate" recoveries, which are based on Aggregate Recovery Rates developed from non-maternity claims with a 90-day elimination period, To Age 65-70 benefit period and all occupation classes combined. The Aggregate Recovery Rates are sex distinct and vary by occupation class and claim year. Aggregate recoveries are discussed in more detail in Sections 1 and 2.

Section 4 has the following three subsections:`

4.1 Recovery Experience by Occupation Class and Benefit Period
4.2 Recovery Experience by Diagnosis and Benefit Period
4.3 Recovery Experience by Claim Year and Benefit Period

The tables below show the Actual/Aggregate Recovery Ratios ("recovery ratios") and the actual number of claims by benefit period. Blanks are shown in the tables for any cells with less than five actual recoveries. The number of actual recoveries provided in the tables are rounded to the nearest whole number. Recovery counts may be fractional due to partial time periods. Consequently, a blank is displayed where the unrounded recovery count is less than five but rounds to five.

Because most short-term claims do not have benefit periods longer than five years, the comparisons of recovery experience by benefit period in subsections 4.1 and 4.2 are limited to claim years 1-6. Subsection 4.3 expands the analysis to include claim years 7-10 for To Age 65-70 and lifetime benefit periods.

4.1 RECOVERY EXPERIENCE BY OCCUPATION CLASS AND BENEFIT PERIOD

This subsection compares recovery experience over claim years 1-6 combined by occupation class and benefit period. The analysis is separate by sex.

4.1.1 MALE RECOVERY EXPERIENCE

Table 4.1 compares male Actual/Aggregate Recovery Ratios by occupation class and benefit period when all Diagnosis Groupings are combined, over claim years 1-6.

Table 4.1
MALE ACTUAL/AGGREGATE RECOVERY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Occupation Class	ACTUAL/AGGREGATE RECOVERY RATIO				ACTUAL NUMBER OF RECOVERIES			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	156%	102%	86%	**101%**	799	6,107	2,127	**9,033**
1	140%	94%	81%	**97%**	1,315	6,632	946	**8,892**
2-4	185%	116%	96%	**145%**	2,801	1,994	202	**4,997**
Total	**166%**	**100%**	**85%**	**106%**	**4,915**	**14,733**	**3,275**	**22,922**

In all three occupation classes, the male short-term recovery ratios are higher than the male To Age 65-70 recovery ratios, which are higher than the lifetime recovery ratios.

4.1.2 FEMALE RECOVERY EXPERIENCE

Table 4.2 compares female Actual/Aggregate Recovery Ratios by occupation class and benefit period, over claim years 1-6, when all non-maternity Diagnosis Groupings are combined. Maternity claims are excluded in Table 4.2 but shown separately in Table 4.3.

Table 4.2

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Occupation Class	ACTUAL/AGGREGATE RECOVERY RATIO				ACTUAL NUMBER OF RECOVERIES			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	149%	105%	90%	**105%**	553	3,745	923	**5,221**
1	126%	93%	82%	**96%**	715	3,122	337	**4,175**
2-4	138%	108%	108%	**119%**	570	767	46	**1,383**
Total	**136%**	**100%**	**88%**	**103%**	**1,838**	**7,634**	**1,306**	**10,778**

As observed in male recovery experience, the female short-term recovery ratios in all three occupation classes are higher than the corresponding To Age 65-70 recovery ratios. The female lifetime recovery ratios are lower than the To Age 65-70 recovery ratios in occupation classes M and 1 but are close to the To Age 65-70 recovery ratios in occupation class 2-4.

Table 4.3 compares the Actual/Aggregate Recovery Ratios for maternity claims by occupation class and benefit period.

Table 4.3

MATERNITY ACTUAL/AGGREGATE RECOVERY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD - CLAIM YEARS 1-6 COMBINED

Occupation Class	ACTUAL/AGGREGATE RECOVERY RATIO				ACTUAL NUMBER OF RECOVERIES			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	479%	489%	526%	**495%**	119	1,684	396	**2,199**
1	483%	533%	663%	**531%**	57	519	19	**595**
2-4	478%	361%		**397%**	72	109	3	**183**
Total	**480%**	**490%**	**527%**	**494%**	**248**	**2,312**	**418**	**2,977**

The female short-term and lifetime recovery ratios for maternity claims do not vary from To Age 65-70 recovery ratios to the same extent observed for female non-maternity claims in Table 4.3.

4.2 RECOVERY EXPERIENCE BY DIAGNOSIS AND BENEFIT PERIOD

This subsection compares Actual/Aggregate Recovery Ratios by benefit period and Diagnosis Grouping for male and female claims separately.

4.2.1 MALE RECOVERY EXPERIENCE

Table 4.4 shows the male Actual/Aggregate Recovery Ratios by Diagnosis Grouping and benefit period.

Table 4.4

MALE ACTUAL/AGGREGATE RECOVERY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Diagnosis Grouping	ACTUAL/AGGREGATE RECOVERY RATIO				ACTUAL NUMBER OF RECOVERIES			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Back	136%	92%	63%	**92%**	524	1,669	369	**2,562**
Injury Other Than Back	272%	215%	203%	**226%**	1,418	3,002	762	**5,182**
Other Musculoskeletal	223%	127%	102%	**139%**	1,000	2,193	467	**3,660**
All Physical Diagnoses	**217%**	**139%**	**112%**	**148%**	**2,942**	**6,864**	**1,599**	**11,405**
Mental & Nervous	88%	67%	52%	**66%**	220	1,342	272	**1,834**
Alcohol & Drug	172%	165%	156%	**164%**	90	740	162	**992**
MNAD	**103%**	**85%**	**69%**	**84%**	**310**	**2,082**	**434**	**2,826**
Cancer	120%	92%	83%	**94%**	442	2,110	377	**2,929**
Circulatory	159%	99%	82%	**105%**	430	1,263	249	**1,942**
Nervous System	47%	28%	23%	**29%**	115	471	102	**688**
Other	160%	94%	88%	**102%**	676	1,942	515	**3,132**
Non-Physical & MNAD	**127%**	**79%**	**70%**	**83%**	**1,663**	**5,786**	**1,242**	**8,691**
All	**166%**	**100%**	**85%**	**106%**	**4,915**	**14,733**	**3,275**	**22,922**

In all Diagnosis Groupings, the short-term benefit period has the highest male recovery ratios, and the lifetime benefit period has the lowest male recovery ratios. The male short-term and lifetime recovery ratios have similar relative patterns by Diagnosis Grouping. For example, in all three benefit periods, injury other than back has the highest recovery ratio and nervous system has the lowest, followed by mental & nervous.

4.2.2 FEMALE RECOVERY EXPERIENCE

Table 4.5 shows the female Actual/Aggregate Recovery Ratios by Diagnosis Grouping and benefit period.

Table 4.5

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Diagnosis Grouping	ACTUAL/AGGREGATE RECOVERY RATIO				ACTUAL NUMBER OF RECOVERIES			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Back	124%	82%	68%	**85%**	187	730	127	**1,044**
Injury Other Than Back	267%	219%	185%	**220%**	344	1,328	262	**1,934**
Other Musculoskeletal	147%	88%	87%	**96%**	343	1,195	217	**1,755**
All Physical Diagnoses	**170%**	**114%**	**104%**	**120%**	**874**	**3,253**	**607**	**4,733**
Mental & Nervous	97%	75%	52%	**75%**	194	674	98	**965**
Alcohol & Drug	126%	154%	60%	**138%**	14	142	10	**166**
MNAD	**98%**	**82%**	**53%**	**80%**	**208**	**815**	**108**	**1,131**
Cancer	129%	121%	107%	**120%**	284	1,781	278	**2,343**
Circulatory	87%	85%	59%	**81%**	56	283	37	**377**
Nervous System	62%	36%	38%	**38%**	66	329	70	**465**
Other	149%	110%	113%	**117%**	351	1,172	207	**1,729**
Non-Physical & MNAD	**121%**	**94%**	**85%**	**96%**	**757**	**3,565**	**592**	**4,914**
All	**136%**	**100%**	**88%**	**103%**	**1,838**	**7,634**	**1,306**	**10,778**

As observed with males, the short-term benefit period has the highest female recovery ratios, and the lifetime benefit period has the lowest female recovery ratios. The female short-term and lifetime recovery ratios have similar relative patterns by Diagnosis Grouping as observed for males. For example, in all three benefit periods, injury other than back has the highest recovery ratio and nervous system has the lowest, followed by mental & nervous.

4.3 RECOVERY EXPERIENCE BY CLAIM YEAR AND BENEFIT PERIOD

This subsection compares the Actual/Aggregate Recovery Ratios by claim duration and benefit period separately for all occupation classes combined. Claim duration groupings are year 1, years 2-6, and years 7-10. The comparison for claim durations 7-10 excludes the short-term benefit periods because short-term claims do not produce a material volume of claim exposure in years 7-10.

4.3.1 MALE RECOVERY EXPERIENCE

Table 4.6 compares the male Actual/Aggregate Recovery Ratios by claim year and benefit period for all occupation classes and Diagnosis Groupings combined.

Table 4.6

MALE ACTUAL/AGGREGATE RECOVERY RATIOS BY CLAIM YEAR AND BENEFIT PERIOD FOR ALL OCCUPATION CLASSES AND DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/AGGREGATE RECOVERY RATIO				ACTUAL NUMBER OF RECOVERIES			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	163%	100%	93%	**108%**	3,554	10,004	2,314	**15,872**
Years 2-6	175%	100%	71%	**103%**	1,361	4,729	960	**7,050**
Years 7-10		100%	102%	**101%**		293	117	**410**

The male short-term recovery ratios increase between year 1 and years 2-6, while the lifetime recovery ratios decrease. The male To Age 65-70 and lifetime recovery ratios are quite close in years 7-10.

4.3.2 FEMALE RECOVERY EEXPERIENCE

Table 4.7 compares female Actual/Aggregate Recovery Ratios by claim year and benefit period for all occupation classes and non-maternity Diagnosis Groupings combined. Maternity claims are excluded to facilitate the comparison to male recovery experience.

Table 4.7

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS BY CLAIM YEAR AND BENEFIT PERIOD FOR ALL NON-MATERNITY DIAGNOSIS GROUPINGS AND OCCUPATION CLASSES COMBINED

Claim Year	ACTUAL/AGGREGATE RECOVERY RATIO				ACTUAL NUMBER OF RECOVERIES			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	126%	100%	91%	**102%**	1,221	5,111	877	**7,210**
Years 2-6	162%	100%	84%	**104%**	617	2,522	429	**3,569**
Years 7-10		100%	96%	**99%**		166	40	**207**

Similar to males, the female short-term recovery ratios increase between year 1 and years 2-6, while the lifetime recovery ratios decrease. The female To Age 65-70 and lifetime recovery ratios are quite close in years 7-10.

Table 4.8 compares maternity Actual/Aggregate Recovery Ratios by claim year and benefit period with all occupation classes combined.

Table 4.8

ACTUAL/AGGREGATE RECOVERY RATIOS FOR MATERNITY BY CLAIM YEAR AND BENEFIT PERIOD WITH ALL OCCUPATION CLASSES COMBINED

Claim Year	ACTUAL/AGGREGATE RECOVERY RATIO				ACTUAL NUMBER OF RECOVERIES			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	504%	499%	519%	**502%**	245	2,211	395	**2,852**
Years 2-6		354%	719%	**363%**	3	101	23	**126**
Years 7-10		588%		**491%**	0	8	0	**8**

The maternity short-term and To Age 65-70 recovery ratios in year 1 are very close, while the lifetime ratio in Year 1 is higher than short-term and To Age 65-70 ratios. There is a significant reduction in the maternity recovery ratios from year 1 to years 2-6. The maternity recovery ratios in years 7-10 are not meaningful due to the low volume of recoveries.

Section 5 Disabled Life Recovery Experience by Elimination Period

Section 5 discusses how IDI disabled life recovery experience varies by elimination period relative to occupation class, diagnosis, and claim year. This section shows analyses for claims with 30-day, 60-day, 90-day, and 180-day elimination periods, but not elimination periods under 30-day and 720-day.

Actual recoveries are compared to "aggregate" recoveries, which are based on Aggregate Recovery Rates developed from non-maternity claims with a 90-day elimination period, To Age 65-70 benefit period and all occupation classes combined. Section 2 discusses the derivation of aggregate recoveries in more detail. The Aggregate Recovery Rates used in Sections 4 and 5 are the same.

There are three subsections:

5.1 Recovery Experience by Occupation Class and Elimination Period
5.2 Recovery Experience by Diagnosis Grouping and Elimination Period
5.3 Recovery Experience by Claim Year and Elimination Period

Actual recoveries are compared to "aggregate" recoveries, which are based on Aggregate Recovery Rates developed from non-maternity claims with a 90-day elimination period, To Age 65-70 benefit period and all occupation classes combined. The Aggregate Recovery Rates are sex distinct and vary by occupation class and claim year. The derivation of Aggregate deaths is discussed in more detail in Section 2.

The tables below show the Actual/Aggregate Recovery Ratios ("recovery ratios") and the actual number of claims by elimination period. Blanks are shown in the tables for any cells with less than five actual recoveries. The number of actual recoveries provided in the tables are rounded to the nearest whole number, as recovery counts may be fractional due to partial time periods. Consequently, a blank is displayed where the unrounded recovery count is less than five but rounds to five. Analysis covers claim years 1-10.

5.1 RECOVERY EXPERIENCE BY DIAGNOSIS GROUPING AND ELIMINATION PERIOD

This subsection compares recovery experience over claim years 1-10 by occupation class and elimination period. The analysis is separated by sex.

5.1.1 MALE RECOVERY EXPERIENCE

Table 5.1 compares male Actual/Aggregate Recovery Ratios by occupation class and elimination period when all Diagnosis Groupings are combined, over claim years 1-10.

Table 5.1
MALE ACTUAL/AGGREGATE RECOVERY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD FOR ALL DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-10

Occupation Class	ACTUAL/AGGREGATE RECOVERY RATIO					ACTUAL NUMBER OF RECOVERIES				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	196%	123%	102%	69%	**108%**	1,038	1,100	6,211	327	**8,676**
1	174%	112%	95%	60%	**98%**	1,662	1,097	6,786	1,064	**10,609**
2-4	243%	133%	116%	68%	**129%**	894	352	2,028	208	**3,482**
Total	**194%**	**119%**	**100%**	**63%**	**106%**	**3,594**	**2,549**	**15,025**	**1,599**	**22,767**

In all three occupation classes, the male recovery ratios decrease as the elimination periods increase. Occupation class 1 has the lowest recovery ratio in each elimination period. Occupation class 2-4 has the highest recovery ratio in the 30-day, 60-day, and 90-day elimination periods. Occupation class M and occupation class 2-4 have comparable recovery ratios for the 180-day elimination period.

5.1.2 FEMALE RECOVERY EXPERIENCE

Table 5.2 compares female Actual/Aggregate Recovery Ratios by occupation class and elimination period, over claim years 1-10, when all non-maternity Diagnosis Groupings are combined. Maternity claims are excluded in the comparison to facilitate the comparison to male recovery experience.

Table 5.2

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD FOR ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-10

Occupation Class	ACTUAL/AGGREGATE RECOVERY RATIO					ACTUAL NUMBER OF RECOVERIES				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	271%	165%	105%	71%	**117%**	730	616	3,821	213	**5,380**
1	226%	134%	94%	65%	**101%**	884	539	3,201	664	**5,289**
2-4	266%	154%	108%	84%	**119%**	238	124	778	193	**1,332**
Total	**247%**	**149%**	**100%**	**69%**	109%	**1,852**	**1,279**	**7,800**	**1,070**	**12,001**

In all three occupation classes, the female non-maternity recovery ratios decrease as the elimination periods increase. Occupation class 1 has the lowest female non-maternity recovery ratios in each elimination period among the three occupation classes. The female non-maternity recovery ratios for occupation class M are close to those for occupation class 2-4.

Table 5.3 compares the maternity Actual/Aggregate Recovery Ratios by occupation class and elimination period over years 1-10.

Table 5.3

MATERNITY ACTUAL/AGGREGATE RECOVERY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD - CLAIM YEARS 1-10 COMBINED

Occupation Class	ACTUAL/AGGREGATE RECOVERY RATIO					ACTUAL NUMBER OF RECOVERIES				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	566%	392%	489%	359%	**485%**	7	24	1,689	28	**1,747**
1	825%	414%	532%	798%	**542%**	21	17	519	25	**582**
2-4	575%		365%	555%	**385%**	6	4	111	10	**131**
Total	**705%**	**408%**	**490%**	**495%**	491%	**34**	**44**	**2,320**	**63**	**2,460**

Unlike the trend observed with female non-maternity claims, the maternity recovery ratios do not decrease consistently as the elimination period increases. In contrast to the non-maternity experience, occupation class 1 has the highest maternity recovery ratios among the three occupation classes in all elimination periods.

5.2 RECOVERY EXPERIENCE BY DIAGNOSIS AND ELIMINATION PERIOD

This subsection compares Actual/Aggregate Recovery Ratios by elimination period and Diagnosis Grouping for male and female claims separately.

5.2.1 MALE RECOVERY EXPERIENCE

Table 5.4 shows the male Actual/Aggregate Recovery Ratios by Diagnosis Grouping and elimination period over claim years 1-10.

Table 5.4

MALE ACTUAL/AGGREGATE RECOVERY RATIOS BY DIAGNOSIS GROUPIING AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES COMBINED - CLAIM YEARS 1-10

Diagnosis Grouping	ACTUAL/AGGREGATE RECOVERY RATIO					ACTUAL NUMBER OF RECOVERIES				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Back	158%	88%	92%	55%	**94%**	413	257	1,712	156	**2,538**
Injury Other Than Back	378%	268%	215%	155%	**232%**	701	516	3,051	182	**4,450**
Other Musculoskeletal	277%	157%	126%	89%	**145%**	830	520	2,221	174	**3,746**
All Physical Diagnoses	**260%**	**159%**	**138%**	**86%**	**149%**	**1,944**	**1,294**	**6,984**	**512**	**10,733**
Mental & Nervous	67%	66%	68%	76%	**69%**	124	164	1,401	274	**1,962**
Alcohol & Drug	243%	121%	164%	111%	**159%**	36	33	746	56	**871**
MNAD	**80%**	**71%**	**86%**	**80%**	**84%**	**160**	**197**	**2,147**	**330**	**2,833**
Cancer	138%	102%	92%	68%	**93%**	290	324	2,134	275	**3,024**
Circulatory	198%	135%	100%	59%	**110%**	443	276	1,302	137	**2,158**
Nervous System	70%	30%	28%	18%	**29%**	117	75	482	63	**737**
Other	210%	138%	94%	52%	**101%**	640	384	1,976	282	**3,282**
Non-Physical & Non-MNAD	**164%**	**101%**	**79%**	**49%**	**84%**	**1,490**	**1,058**	**5,895**	**757**	**9,201**
All	**194%**	**119%**	**100%**	**63%**	**106%**	**3,594**	**2,549**	**15,025**	**1,599**	**22,767**

The male recovery ratios for all Diagnosis Groupings, except mental & nervous, decrease as the elimination periods increase.

5.2.2 FEMALE RECOVERY EXPERIENCE

Table 5.5 shows the female Actual/Aggregate Recovery Ratios by Diagnosis Grouping and elimination period over claim years 1-10.

Table 5.5

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS BY DIAGNOSIS GROUPING AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES COMBINED - CLAIM YEARS 1-10

Diagnosis Grouping	ACTUAL/AGGREGATE RECOVERY RATIO					ACTUAL NUMBER OF RECOVERIES				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Back	193%	90%	83%	64%	**89%**	192	104	752	112	**1,159**
Injury Other Than Back	488%	297%	218%	159%	**247%**	393	271	1,340	100	**2,104**
Other Musculoskeletal	319%	194%	88%	49%	**109%**	405	328	1,229	110	**2,071**
All Physical Diagnoses	**323%**	**187%**	**114%**	**70%**	**131%**	**990**	**703**	**3,321**	**322**	**5,335**
Mental & Nervous	126%	72%	76%	75%	**78%**	87	79	707	159	**1,031**
Alcohol & Drug		142%	158%	185%	**156%**	5	8	147	13	**172**
MNAD	**123%**	**76%**	**84%**	**79%**	**84%**	**92**	**87**	**853**	**172**	**1,204**
Cancer	184%	146%	121%	120%	**126%**	199	212	1,794	283	**2,488**
Circulatory	163%	91%	84%	70%	**88%**	53	36	289	52	**430**
Nervous System	115%	47%	36%	26%	**37%**	53	33	339	62	**488**
Other	255%	188%	111%	54%	**120%**	465	209	1,203	180	**2,058**
Non-Physical & Non-MNAD	**208%**	**134%**	**94%**	**65%**	**100%**	**771**	**490**	**3,626**	**577**	**5,463**
All	**247%**	**149%**	**100%**	**69%**	**109%**	**1,852**	**1,279**	**7,800**	**1,070**	**12,001**

The female recovery ratios for almost all the non-maternity Diagnosis Groupings decrease as the elimination periods increase. Mental & nervous and alcohol & drug are the exceptions. The female mental & nervous recovery ratios are very close for the 60-day, 90-day, and 180-day elimination periods.

5.3 RECOVERY EXPERIENCE BY CLAIM YEAR AND ELIMINATION PERIOD

This subsection compares the Actual/Aggregate Recovery Ratios by claim duration and elimination period separately for all occupation classes combined. Claim duration groupings are year 1, years 2-6, and years 7-10.

5.3.1 MALE RECOVERY EXPERIENCE

Table 5.6 compares the male Actual/Aggregate Recovery Ratios by claim duration and elimination period for all occupation classes and Diagnosis Groupings combined.

Table 5.6

MALE ACTUAL/AGGREGATE RECOVERY RATIOS BY CLAIM YEAR AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES AND DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/AGGREGATE RECOVERY RATIO					ACTUAL NUMBER OF RECOVERIES				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	228%	131%	100%	54%	**111%**	3,065	1,899	10,004	692	**15,659**
Years 2-6	105%	94%	100%	71%	**95%**	494	600	4,729	840	**6,663**
Years 7-10	88%	97%	100%	93%	**98%**	35	49	293	68	**445**

The male recovery ratios in claim year 1 decrease as the elimination period increases. There appears to be no decreasing pattern in years 2-6 for the elimination periods under 180 days. The 180-day elimination

period has the lowest male Actual/Aggregate Recovery Ratios among all three claim year groupings. The recovery ratio in year 1 exceeds the recovery ratio in years 2-6 for the 30-day and 60-day elimination periods but is lower for the 180-day elimination period.

5.3.2 FEMALE RECOVERY EXPERIENCE

Table 5.7 compares the female Actual/Aggregate Recovery Ratios by claim year and elimination period for all occupation classes and non-maternity Diagnosis Groupings combined.

Table 5.7

FEMALE ACTUAL/AGGREGATE RECOVERY RATIOS BY CLAIM YEAR AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES AND NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/AGGREGATE RECOVERY RATIO					NUMBER OF RECOVERIES				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	290%	169%	100%	62%	**117%**	1,633	1,000	5,111	487	**8,232**
Years 2-6	120%	107%	100%	76%	**97%**	206	261	2,522	557	**3,547**
Years 7-10	80%	80%	100%	59%	**90%**	13	18	166	26	**222**

The female recovery ratios in claim year 1 for non-maternity Diagnosis Groupings combined decrease as the elimination periods increase in a similar pattern to males. The 180-day elimination period has the lowest female Actual/Aggregate Recovery Ratios among all three claim year groupings.

Table 5.8 compares the maternity Actual/Aggregate Recovery Ratios by claim year and elimination period for all occupation classes combined.

Table 5.8

MATERNITY ACTUAL/AGGREGATE RECOVERY RATIOS BY CLAIM YEAR AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES COMBINED

Claim Year	ACTUAL/AGGREGATE RECOVERY RATIO					ACTUAL NUMBER OF RECOVERIES				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	735%	427%	499%	542%	**500%**	34	42	2,211	59	**2,346**
Years 2-6			354%		**344%**	0	2	101	4	**107**
Years 7-10			588%		**443%**	0	0	8	0	**8**

The maternity recovery ratios show no decreasing patten as the elimination period increases in the first claim year. There is a very low volume of maternity recoveries after the first claim year for elimination periods other than 90-day.

Section 6 Disabled Life Mortality Experience by Benefit Period

Section 6 discusses how IDI disabled life mortality experience varies by benefit period relative to occupation class, diagnosis, and claim year, separately for males and females. The benefit period groupings are short-term, To Age 65-70, and lifetime. As in Section 4, experience in Section 6 is based on IDI claims with a 90-day elimination period.

Actual deaths are compared to "Standard" deaths, which are based on the 2015 VBT mortality table, a benchmark that was selected to represent all active and disabled life policies combined, in the absence of an industry mortality table based on IDI lives. The Standard mortality rates are sex distinct and do not vary by claim year. Section 2 discusses the derivation of Standard deaths in more detail.

There are three subsections:

6.1 Mortality Experience by Occupation Class and Benefit Period
6.2 Mortality Experience by Diagnosis and Benefit Period
6.3 Mortality Experience by Claim Year and Benefit Period

The tables below compare Actual/Standard Mortality Ratios ("mortality ratios") and actual number of deaths. Blanks are shown in the tables for any cells with less than five actual deaths. The number of actual deaths provided in the tables are rounded to the nearest whole number. Mortality counts may be fractional due to partial time periods. Consequently, a blank is displayed where the unrounded mortality count is less than five but rounds to five.

Because most short-term claims do not have benefit periods longer than five years, the comparisons of mortality experience by benefit period in subsections 6.1 and 6.2 are limited to claim years 1-6. Subsection 6.3 expands the analysis to include claim years 7-10 for To Age 65-70 and lifetime claims.

When comparing male and female disabled life mortality using mortality ratios, the reader should keep in mind that Standard mortality rates (see Appendix C) are sex distinct with female mortality substantially lower than male mortality. Even where the female Actual/Standard Mortality Ratios exceed the corresponding male mortality ratios, the female mortality rates will be generally lower than the male mortality rates.

Maternity claims are excluded from the female mortality analysis to be consistent with the female recovery analysis. However, it should be noted that there is a very low volume of maternity deaths, and their exclusion has an immaterial impact on the overall results and conclusions.

6.1 MORTALITY EXPERIENCE BY OCCUPATION CLASS AND BENEFIT PERIOD

This subsection compares mortality experience over claim years 1-6 by occupation class and benefit period. The analysis is separated by sex.

6.1.1 MALE MORTALITY EXPERIENCE

Table 6.1 compares male Actual/Standard Mortality Ratios by occupation class and benefit period with all Diagnosis Groupings combined, over claim years 1-6.

Table 6.1

MALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	660%	735%	526%	**665%**	138	1,417	509	**2,064**
1	1188%	1095%	817%	**1065%**	425	2,670	384	**3,480**
2-4	1001%	889%	458%	**902%**	333	444	27	**803**
Total	**996%**	**931%**	**615%**	**874%**	**896**	**4,531**	**920**	**6,347**

The male short-term and To Age 65-70 mortality ratios are comparable among the three occupation classes. The male lifetime mortality ratios are lower than short-term and To Age 65-70 mortality ratios for each of the three occupation classes. Occupation class 1 has the highest male mortality ratio among the occupation classes in all three benefit periods. Occupation class M has the lowest male mortality ratio among the occupation classes for the short-term and To Age 65-70 benefit periods. Occupation class 2-4 has the lowest lifetime Actual/Standard Mortality Ratio among the three occupation classes.

Table 6.2 compares male Actual/Standard Mortality Ratios by occupation class and benefit period for cancer only, over claim years 1-6.

Table 6.2

MALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR CANCER ONLY - CLAIM YEARS 1-6

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	4231%	4651%	4532%	**4591%**	98	985	338	**1,421**
1	5464%	6041%	5510%	**5909%**	290	1,895	243	**2,429**
2-4	7989%	4709%	2706%	**5586%**	221	285	12	**518**
Total	**5861%**	**5401%**	**4814%**	**5371%**	**609**	**3,165**	**594**	**4,368**

For cancer only and all benefit periods combined, the male mortality ratio is 5,371% compared to 874% for all Diagnosis Groupings combined. Cancer represents 69% of all male disabled life deaths. The male cancer mortality ratios for short-term and To Age 65-70 benefit periods are comparable, but the lifetime mortality ratio is significantly lower. Among the three occupation classes, occupation class 1 has the highest male cancer mortality ratio for the To Age 65-70 and lifetime benefit periods, while occupation class2-4 has the highest short-term mortality ratio. Occupation class 2-4 has the lowest lifetime cancer mortality ratio, but this is based only on 12 deaths.

Table 6.3 compares male Actual/Standard Mortality Ratios by occupation class and benefit period for the non-cancer Diagnosis Groupings combined, over claim years 1-6.

Table 6.3

MALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL NON-CANCER DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	215%	252%	191%	**230%**	40	433	170	**643**
1	443%	365%	331%	**368%**	135	775	141	**1,051**
2-4	367%	361%	270%	**357%**	112	158	15	**285**
Total	**361%**	**319%**	**238%**	**307%**	**287**	**1,366**	**326**	**1,979**

For non-cancer Diagnosis Groupings and all benefit periods combined, the male mortality ratio is 307% compared to 874% for all Diagnosis Groupings combined and 5,371% for cancer only. The male non-cancer mortality ratio is highest for the short-term benefit period and lowest for lifetime. Occupation class 1 has the highest male non-cancer mortality ratio among the three occupation classes for all three benefit periods, and occupation class M has the lowest.

6.1.2 FEMALE MORTALITY EXPERIENCE

Table 6.4 compares female Actual/Standard Mortality Ratios by occupation class and benefit period with all non-maternity Diagnosis Groupings combined, over claim years 1-6.

Table 6.4

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	987%	774%	779%	**792%**	60	406	130	**595**
1	1216%	1307%	969%	**1255%**	143	867	102	**1,112**
2-4	1011%	1041%	890%	**1027%**	66	143	6	**214**
Total	**1104%**	**1068%**	**854%**	**1041%**	**268**	**1,416**	**237**	**1,921**

The female short-term and To Age 65-70 mortality ratios are comparable among the three occupation classes. The female lifetime mortality ratios are lower than short-term and To Age 65-70 mortality ratios for occupation classes 1 and 2-4. Occupation class 1 has the highest female mortality ratio among the occupation classes in all three benefit periods, and occupation class M has the lowest.

Table 6.5 compares female Actual/Standard Mortality Ratios by occupation class and benefit period for cancer only, over claim years 1-6.

Table 6.5

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR CANCER ONLY - CLAIM YEARS 1-6

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	5642%	4623%	4198%	**4607%**	43	315	93	**451**
1	6144%	6563%	4769%	**6286%**	107	655	79	**841**
2-4	7723%	6116%		**6482%**	50	113	4	**168**
Total	**6347%**	**5810%**	**4453%**	**5667%**	**200**	**1,083**	**176**	**1,460**

For cancer only with all benefit periods combined, the female mortality ratio is 5,667% compared to 1,041% for all Diagnosis Groupings combined. Cancer represents 76% of all female disabled life deaths. The female cancer mortality ratio is highest among the three benefit periods for short-term and lower for lifetime. Among the three occupation classes, occupation class 1 has the highest female cancer mortality ratio for the To Age 65-70 and lifetime benefit periods, while occupation class 2-4 has the highest short-term mortality ratio.

Table 6.6 compares female Actual/Standard Mortality Ratios by occupation class and benefit period for non-cancer, non-maternity Diagnosis Groupings combined, over claim years 1-6.

Table 6.6

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL NON-CANCER, NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
M	309%	199%	254%	**220%**	16	91	37	**144**
1	361%	376%	259%	**360%**	36	212	23	**271**
2-4	263%	251%		**256%**	15	30	1	**47**
Total	**321%**	**292%**	**257%**	**290%**	**68**	**332**	**61**	**461**

For non-cancer and all benefit periods combined, the female mortality ratio is 290% compared to 1,041% for all Diagnosis Groupings combined and 5,667% for cancer only. The female non-cancer mortality ratio is highest for the short-term benefit period and lowest for lifetime. Occupation class 1 has the highest female non-cancer mortality ratio among the three occupation classes for all three benefit periods, and occupation class M has the lowest.

6.2 MORTALITY EXPERIENCE BY DIAGNOSIS AND BENEFIT PERIOD

This subsection compares Actual/Standard Mortality Ratios by Diagnosis Grouping and benefit period for male and female separately.

6.2.1 MALE MORTALITY EXPERIENCE

Table 6.7 shows the male Actual/Standard Mortality Ratios by Diagnosis Grouping and benefit period.

Table 6.7

MALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Diagnosis Grouping	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Back	99%	126%	73%	**109%**	13	82	19	**113**
Injury Other Than Back	238%	141%	79%	**144%**	21	45	9	**76**
Other Musculoskeletal	83%	108%		**87%**	10	67	3	**79**
All Physical	**131%**	**122%**	**56%**	**108%**	**44**	**193**	**31**	**268**
Mental & Nervous	382%	309%	256%	**305%**	29	193	46	**268**
Alcohol & Drug	1457%	650%	393%	**642%**	10	47	10	**66**
MNAD	**469%**	**345%**	**273%**	**340%**	**39**	**239**	**55**	**334**
Cancer	5861%	5401%	4814%	**5371%**	609	3,165	594	**4,368**
Circulatory	422%	380%	213%	**353%**	49	215	36	**300**
Nervous System	392%	454%	430%	**442%**	42	309	88	**439**
Other	724%	542%	491%	**556%**	114	410	116	**639**
Non-Physical, Non-MNAD	**1682%**	**1583%**	**1137%**	**1510%**	**813**	**4,099**	**834**	**5,746**
All	**996%**	**931%**	**615%**	**874%**	**896**	**4,531**	**920**	**6,347**

In all three benefit periods, back, injury other than back, and other musculoskeletal have the lowest male mortality among all the Diagnosis Groupings at 108%, followed by MNAD claims with 340% and non-physical, non-MNAD claims with 1,510%. Cancer has the highest mortality by a large margin in each benefit period. Alcohol & drug has the next highest mortality ratio.

In most Diagnosis Groupings, short-term mortality is highest among the three benefit periods, while lifetime mortality is the lowest. However, there are some exceptions, such as nervous system, where short-term has the lowest mortality and lifetime mortality has the highest.

6.2.2 FEMALE MORTALITY EXPERIENCE

Table 6.8 shows the female Actual/Standard Mortality Ratios by Diagnosis Grouping and benefit period.

Table 6.8

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND BENEFIT PERIOD FOR ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-6

Diagnosis Grouping	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Back	183%	184%	163%	**181%**	7	31	6	**43**
Injury Other Than Back		171%		**141%**	1	14	2	**17**
Other Musculoskeletal		73%		**65%**	4	20	1	**24**
All Physical	**112%**	**124%**	**76%**	**115%**	**12**	**65**	**9**	**85**
Mental & Nervous		295%	325%	**280%**	3	46	13	**62**
Alcohol & Drug		708%		**669%**	1	6	0	**8**
MNAD		**318%**	**309%**	**299%**	**5**	**52**	**13**	**70**
Cancer	6347%	5810%	4453%	**5667%**	200	1,083	176	**1,460**
Circulatory	556%	537%	482%	**533%**	8	43	7	**58**
Nervous System	680%	413%	484%	**448%**	14	70	17	**100**
Other	648%	510%	448%	**524%**	30	102	16	**149**
Non-Physical, Non-MNAD	**2240%**	**2040%**	**1736%**	**2023%**	**252**	**1,298**	**216**	**1,766**
All	**1104%**	**1068%**	**854%**	**1041%**	**268**	**1,416**	**237**	**1,921**

The analysis of female mortality by Diagnosis Grouping is less robust due to the lower volume of female deaths. Regardless, similar mortality patterns by Diagnosis Grouping can be observed for females as observed for males. For example, the back, injury other than back, and other musculoskeletal have the lowest mortality ratios, while cancer and alcohol & drug have the highest mortality ratios.

6.3 MORTALITY EXPERIENCE BY CLAIM YEAR AND BENEFIT PERIOD

This subsection compares the Actual/Standard Mortality Ratios by claim duration and benefit period separately for all occupation classes combined. Claim duration groupings are year 1, years 2-6, and years 7-10. The comparisons for claim durations 7-10 exclude short-term benefit periods because short-term claims do not produce a meaningful volume of claim exposure in years 7-10.

6.3.1 MALE MORTALITY EXPERIENCE

Table 6.9 compares the male Actual/Standard Mortality Ratios by claim duration and benefit period for all occupation classes and Diagnosis Groupings combined.

Table 6.9

MALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND BENEFIT PERIOD FOR ALL OCCUPATION CLASSES AND DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	1469%	1710%	1280%	**1596%**	366	1,590	306	**2,262**
Years 2-6	815%	747%	489%	**699%**	530	2,941	615	**4,086**
Years 7-10		281%	187%	**248%**		574	203	**778**

The lifetime benefit period has the lowest mortality ratios among the three benefit periods in all three claim year groupings. Male mortality dropped significantly in years 2-6 compared to year 1 and continued to drop in years 7-10.

Table 6.10 compares the male Actual/Standard Mortality Ratios by claim duration and benefit period for all occupation classes combined and the cancer Diagnosis Grouping only.

Table 6.10

MALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND BENEFIT PERIOD FOR ALL OCCUPATION CLASSES COMBINED – CANCER ONLY

Claim Year	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	6908%	7419%	6566%	**7217%**	285	1,270	220	**1,775**
Years 2-6	5169%	4569%	4161%	**4570%**	323	1,896	374	**2,593**
Years 7-10		935%	1148%	**987%**		121	49	**170**

The male cancer mortality ratios drop sharply by claim year. When all benefit periods are combined, the male mortality ratio dropped from 7,217% in year 1 to 987% in years 7-10. A drop in mortality by claim year is observed in each benefit period. There is no apparent trend in the male cancer mortality ratios by benefit period in year 1 and years 2-6. Male lifetime mortality is higher than To Age 65-70 mortality in years 7-10.

Table 6.11 compares the male Actual/Standard Mortality Ratios by claim duration and benefit period for all occupation classes combined and the non-cancer Diagnosis Grouping only.

Table 6.11

MALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND BENEFIT PERIOD FOR ALL OCCUPATION CLASSES COMBINED - NON-CANCER ONLY

Claim Year	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	389%	422%	417%	**416%**	81	320	86	**487**
Years 2-6	351%	297%	206%	**283%**	206	1,046	241	**1,493**
Years 7-10		237%	148%	**205%**		453	155	**608**

The male non-cancer mortality ratios drop by claim year but not as quickly as the cancer mortality ratios.

6.3.2 FEMALE MORTALITY EXPERIENCE

Table 6.12 compares the female Actual/Standard Mortality Ratios by claim duration and benefit period for all occupation classes and non-maternity Diagnosis Groupings combined.

Table 6.12

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND BENEFIT PERIOD FOR ALL OCCUPATION CLASSES AND NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	1650%	1860%	928%	**1696%**	104	452	45	**601**
Years 2-6	913%	890%	838%	**885%**	164	963	193	**1,320**
Years 7-10		373%	222%	**340%**		242	40	**283**

The female mortality ratios drop sharply by claim year. Lifetime has the lowest mortality ratio in all three benefit periods.

Table 6.13 compares the female Actual/Standard Mortality Ratios by claim duration and benefit period for cancer only and all occupation classes combined.

Table 6.13

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND BENEFIT PERIOD FOR ALL OCCUPATION CLASSES COMBINED – CANCER ONLY

Claim Year	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	7356%	7178%	3911%	**6779%**	86	384	38	**509**
Years 2-6	5753%	5259%	4632%	**5210%**	114	699	138	**951**
Years 7-10		1729%	1617%	**1709%**		82	17	**99**

The female cancer mortality ratios drop sharply by claim year for short-term and To Age 65-70 benefit periods. The female cancer mortality ratio for the lifetime benefit period is higher in years 2-6 than year 1.

Table 6.14 compares the female mortality ratios by claim duration and benefit period for all occupation classes and non-cancer, non-maternity Diagnosis Groupings combined.

Table 6.14

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND BENEFIT PERIOD FOR ALL OCCUPATION CLASSES AND NON-CANCER, NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/STANDARD MORTALITY RATIO				ACTUAL NUMBER OF DEATHS			
	Short-Term	To Age 65-70	Lifetime	Total	Short-Term	To Age 65-70	Lifetime	Total
Year 1	348%	358%	165%	**330%**	18	68	6	92
Years 2-6	313%	279%	274%	**282%**	50	264	55	369
Years 7-10		266%	138%	**237%**		160	24	184

With all benefit periods combined, the female mortality ratios for the non-cancer Diagnosis Groupings combined decrease with claim year but not as sharply as observed for cancer. Like cancer, the female non-cancer mortality ratio is higher in years 2-6 than year 1.

Section 7 Disabled Life Mortality Experience by Elimination Period

Section 7 discusses how IDI disabled life mortality experience varies by elimination period relative to occupation class, diagnosis, and claim duration, separately for males and females. The elimination periods are 30-day, 60-day, 90-day, and 180-day. As in Section 5, experience in Section 7 is based on IDI claims with a To Age 65-70 benefit period.

Actual deaths are compared to "Standard" deaths, which are based on the 2015 VBT mortality table, a benchmark that was selected to represent all active and disabled life policies combined, in the absence of an industry mortality table based on IDI lives. The Standard mortality rates are sex distinct and do not vary by claim year. Section 2 discusses the derivation of Standard deaths in more detail.

There are three subsections:

7.1 Mortality Experience by Occupation Class and Elimination Period
7.2 Mortality Experience by Diagnosis Grouping and Elimination Period
7.3 Mortality Experience by Claim Year and Elimination Period

The tables below compare the Actual/Standard Mortality Ratios ("mortality ratios") and the number of actual deaths. Blanks are shown in the tables for any cells with less than five actual deaths. The number of actual deaths provided in the tables are rounded to the nearest whole number. Mortality counts may be fractional due to partial time periods. Consequently, a blank is displayed where the unrounded mortality count is less than five but rounds to five.

When comparing male and female disabled life mortality using mortality ratios, the reader should keep in mind that Standard mortality rates (see Appendix C) are sex distinct with female mortality substantially lower than male mortality. Even where the female Actual/Standard Mortality Ratios exceed the corresponding male mortality ratios, the female mortality rates will be generally lower than the male mortality rates.

Maternity claims are excluded from the female mortality analysis to be consistent with the female recovery analysis. However, it should be noted that there is a very low volume of maternity deaths, and their exclusion has an immaterial impact on the overall results and conclusions.

7.1 MORTALITY EXPERIENCE BY OCCUPATION CLASS AND ELIMINATION PERIOD

7.1.1 MALE MORTALITY EXPERIENCE

Table 7.1 compares male Actual/Standard Mortality Ratios by occupation class and elimination period when all Diagnosis Groupings are combined, over claim years 1-10.

Table 7.1
MALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD FOR ALL DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-10

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO					ACTUAL NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	426%	492%	563%	608%	**546%**	152	255	1,574	216	**2,196**
1	616%	612%	881%	903%	**827%**	422	389	3,016	1,129	**4,956**
2-4	560%	569%	744%	711%	**686%**	122	86	516	144	**867**
Total	**553%**	**559%**	**739%**	**823%**	**711%**	**696**	**730**	**5,105**	**1,489**	**8,020**

The male mortality ratios increase by benefit period. Occupation class 1 has the highest male mortality ratios among the three occupation classes for each of the elimination periods, and occupation class M has the lowest.

Table 7.2 compares male Actual/Standard Mortality Ratios by occupation class and elimination period for cancer only, over claim years 1-10.

Table 7.2
MALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD FOR CANCER ONLY - CLAIM YEARS 1-10

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO					ACTUAL NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	3069%	3317%	3843%	5005%	**3794%**	86	159	1,023	124	**1,391**
1	3605%	3467%	5212%	5261%	**4868%**	229	238	1,965	622	**3,054**
2-4	4690%	3845%	4132%	3901%	**4131%**	70	48	299	81	**497**
Total	**3616%**	**3448%**	**4594%**	**5050%**	4435%	**384**	**444**	**3,286**	**828**	4,942

The male cancer mortality ratios for the 30-day and 60-day elimination periods are relatively close. Occupation class 1 has the highest male cancer mortality ratios among the three occupation classes for the 90-day and 180-day elimination periods, while occupation class 2-4 has the highest for the lower elimination periods.

Table 7.3 compares male mortality ratios by occupation class and elimination period for all non-cancer Diagnosis Groupings combined, over claim years 1-10.

Table 7.3
MALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD FOR ALL NON-CANCER DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-10

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO					ACTUAL NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	202%	205%	218%	278%	**220%**	66	96	551	92	**805**
1	312%	266%	345%	447%	**354%**	194	151	1,051	507	**1,903**
2-4	257%	276%	350%	347%	**324%**	52	38	217	63	**371**
Total	**271%**	**243%**	**294%**	**402%**	303%	**312**	**285**	**1,819**	**662**	3,078

The differences in male non-cancer mortality ratios by occupation class and elimination period are not as pronounced as observed in Tables 7.1 and 7.2.

7.1.2 FEMALE MORTALITY EXPERIENCE

Table 7.4 compares female Actual/Standard Mortality Ratios by occupation class and elimination period, over claim years 1-10, when all non-maternity Diagnosis Groupings are combined.

Table 7.4

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD FOR ALL NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED – CLAIM YEARS 1-10

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO					ACTUAL NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	613%	641%	631%	683%	**635%**	54	82	495	64	**696**
1	710%	784%	1012%	1045%	**974%**	97	124	1,001	407	**1,629**
2-4	410%	745%	803%	941%	**795%**	14	24	162	82	**282**
Total	**638%**	**723%**	**839%**	**970%**	**835%**	**165**	**230**	**1,658**	**554**	**2,607**

With all non-maternity Diagnosis Groupings combined, the female mortality ratios increase as the elimination periods increase. Occupation class 1 has the highest mortality ratios within each elimination period, and occupation class M has the lowest mortality ratio within each elimination period except 30-day.

Table 7.5 compares female Actual/Standard Mortality Ratios by occupation class and elimination period for cancer only, over claim years 1-10.

Table 7.5

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD FOR CANCER ONLY - CLAIM YEARS 1-10

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO					ACTUAL NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	4422%	5467%	3905%	3069%	**4016%**	25	59	337	28	**449**
1	5183%	5426%	5702%	6880%	**5885%**	64	88	710	269	**1,131**
2-4	5245%	5106%	5101%	10423%	**5840%**	10	19	119	48	**197**
Total	**4973%**	**5401%**	**4980%**	**6540%**	**5262%**	**100**	**167**	**1,166**	**345**	**1,778**

The female cancer mortality ratios for occupation class M are significantly lower than the corresponding female mortality ratios for the other two occupation classes. The female cancer mortality ratios for occupation class 1 increase as the elimination period increases, but this pattern does not occur in the other two occupation classes.

Table 7.6 compares female mortality ratios by occupation class and elimination period for all non-cancer, non-maternity Diagnosis Groupings combined, over claim years 1-10.

Table 7.6

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY OCCUPATION CLASS AND ELIMINATION PERIOD FOR ALL NON-CANCER, NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED - CLAIM YEARS 1-10

Occupation Class	ACTUAL/STANDARD MORTALITY RATIO					ACTUAL NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
M	351%	191%	227%	429%	**251%**	29	22	159	36	**246**
1	263%	252%	337%	394%	**336%**	33	36	291	138	**498**
2-4			240%	412%	**265%**	3	5	43	34	**85**
Total	**273%**	**218%**	**283%**	**403%**	**298%**	**65**	**63**	**492**	**209**	**829**

When all female non-cancer, non-maternity Diagnosis Groupings are combined, the 180-day mortality ratios are higher than the mortality ratios for the three lower elimination periods.

7.2 MORTALITY EXPERIENCE BY DIAGNOSIS AND ELIMINATION PERIOD

This subsection compares Actual/Standard Mortality Ratios by elimination period and Diagnosis Grouping for male and female claims separately.

7.2.1 MALE MORTALITY EXPERIENCE

Table 7.7 shows the male Actual/Standard Mortality Ratios by Diagnosis Grouping and elimination period over claim years 1-10.

Table 7.7

MALE ACTUAL/STANDARD MORTALITY RATIOS BY DIAGNOSIS GROUPIING AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES COMBINED - CLAIM YEARS 1-10

Diagnosis Grouping	ACTUAL/STANDARD MORTALITY RATIO					NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Back	101%	158%	115%	106%	**117%**	19	29	109	22	**180**
Injury Other Than Back		173%	144%		**130%**	4	14	67	4	**89**
Other Musculoskeletal	40%	150%	113%	110%	**107%**	7	25	96	19	**147**
All Physical Diagnoses	**67%**	**158%**	**120%**	**103%**	**116%**	31	68	272	45	**416**
Mental & Nervous	282%	264%	278%	429%	**299%**	43	50	266	99	**459**
Alcohol & Drug			598%	818%	**572%**	3	4	61	16	**84**
MNAD	**287%**	**263%**	**308%**	**459%**	**323%**	**47**	**55**	**327**	**115**	**543**
Cancer	3616%	3448%	4594%	5050%	**4435%**	384	444	3286	828	**4942**
Circulatory	368%	189%	328%	503%	**344%**	66	30	270	108	**474**
Nervous System	327%	273%	434%	600%	**431%**	47	52	420	151	**670**
Other	581%	432%	493%	493%	**497%**	122	80	530	244	**975**
Non-Physical, Non-MNAD	**968%**	**911%**	**1258%**	**1184%**	**1175%**	**618**	**607**	**4506**	**1329**	**7061**
All	**553%**	**559%**	**739%**	**823%**	**711%**	**696**	**730**	**5105**	**1489**	**8020**

Back, injury other than back, and other musculoskeletal have the lowest mortality ratios, and cancer has the highest in each elimination period. The 180-day elimination period generally has the highest mortality for all the non-physical Diagnosis Groupings.

7.2.2 FEMALE MORTALITY EXPERIENCE

Table 7.8 shows the female Actual/Standard Mortality Ratios by Diagnosis Grouping and elimination period over claim years 1-10.

Table 7.8
FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY DIAGNOSIS GROUPIING AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES COMBINED - CLAIM YEARS 1-10

Diagnosis Grouping	ACTUAL/STANDARD MORTALITY RATIO					NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Back	145%		182%	86%	**149%**	19	29	109	22	**180**
Injury Other Than Back			160%		**137%**	4	14	67	4	**89**
Other Musculoskeletal	113%		133%	192%	**131%**	7	25	96	19	**147**
All Physical Diagnoses	**110%**	**56%**	**153%**	**147%**	**138%**	**31**	**68**	**272**	**45**	**416**
Mental & Nervous	343%	307%	243%	156%	**246%**	43	50	266	99	**459**
Alcohol & Drug			1275%		**1204%**	3	4	61	16	**84**
MNAD	**372%**	**300%**	**289%**	**185%**	**282%**	**47**	**55**	**327**	**115**	**543**
Cancer	4973%	5401%	4980%	6540%	**5262%**	384	444	3286	828	**4942**
Circulatory	559%	288%	493%	581%	**493%**	66	30	270	108	**474**
Nervous System	427%	257%	337%	640%	**394%**	47	52	420	151	**670**
Other	380%	540%	496%	662%	**535%**	122	80	530	244	**975**
Non-Physical, Non-MNAD	**1231%**	**1534%**	**1597%**	**1634%**	**1571%**	**618**	**607**	**4506**	**1329**	**7061**
All	638%	723%	839%	970%	**835%**	**696**	**730**	**5105**	**1489**	**8020**

The low volume of female deaths in the 30-day, 60-day, and 180-day elimination periods makes it difficult to identify mortality trends across elimination periods. Regardless, for each elimination period, the female mortality ratios tend to follow similar patterns by Diagnosis Code. Female cancer mortality ratios do not appear to vary significantly by elimination period.

7.3 MORTALITY EXPERIENCE BY CLAIM YEAR AND ELIMINATION PERIOD

This subsection compares the Actual/Standard Mortality Ratios by claim duration and elimination period separately for all occupation classes combined. Claim duration groupings are year 1, years 2-6 and years 7-10.

7.3.1 MALE MORTALITY EXPERIENCE

Table 7.9 compares the male Actual/Standard Mortality Ratios by claim duration and elimination period for all occupation classes and Diagnosis Groupings combined.

Table 7.9
MALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES AND DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/STANDARD MORTALITY RATIO					NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	1224%	1260%	1710%	1956%	**1607%**	252	234	1,590	261	**2,337**
Years 2-6	517%	601%	747%	933%	**739%**	350	431	2,941	1,042	**4,764**
Years 7-10	250%	162%	281%	332%	**272%**	94	65	574	185	**919**

In claim years 1 and 2-6, the male mortality ratios increase as the elimination periods increase. In claim years 7-10, the 180-day elimination period has the highest mortality ratio, but there is no increasing or decreasing mortality trend among the shorter elimination periods.

Table 7.10 compares the male Actual/Standard Mortality Ratios by claim duration and elimination period for all occupation classes combined and cancer only.

Table 7.10
MALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND ELIMINATION PERIOD FOR CANCER ONLY, ALL OCCUPATION CLASSES COMBINED

Claim Year	ACTUAL/STANDARD MORTALITY RATIO					NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	6646%	5989%	7419%	7452%	**7167%**	252	234	1,590	261	**2,337**
Years 2-6	3061%	3395%	4569%	5281%	**4422%**	350	431	2,941	1,042	**4,764**
Years 7-10	1013%	413%	935%	1133%	**900%**	94	65	574	185	**919**

The male cancer mortality ratios for the 180-day elimination period are higher than mortality ratios for the shorter elimination periods in all three claim year groupings. The 30-day and 60-day elimination periods have lower mortality ratios than the 90-day and 180-day elimination periods in all three claim year groupings.

Table 7.11 compares the male Actual/Standard Mortality Ratios by claim duration and elimination period for all occupation classes and non-cancer Diagnosis Groupings combined.

Table 7.11
MALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES AND NON-CANCER DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/STANDARD MORTALITY RATIO					NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	401%	291%	422%	461%	**406%**	252	234	1,590	261	**2,337**
Years 2-6	268%	288%	297%	452%	**320%**	350	431	2,941	1,042	**4,764**
Years 7-10	210%	146%	237%	296%	**233%**	94	65	574	185	**919**

The male mortality ratios for all non-cancer Diagnosis Groupings combined decrease by claim year and tend to increase by elimination period, with the 60-day elimination period in claim years 1 and 7-10 being the exception. The level of mortality ratios for the non-cancer Diagnosis Groupings combined appear to not vary as much by claim year and elimination period as observed for all Diagnosis Groupings combined and cancer only.

7.3.2 FEMALE MORTALITY EXPERIENCE

Table 7.12 compares the female Actual/Standard Mortality Ratios by claim year and elimination period for all occupation classes and non-maternity Diagnosis Groupings combined.

Table 7.12

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES AND NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/STANDARD MORTALITY RATIO					NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	721%	1273%	1860%	2518%	**1735%**	32	53	452	107	**644**
Years 2-6	902%	858%	890%	1065%	**924%**	115	141	963	374	**1,592**
Years 7-10	215%	320%	373%	414%	**361%**	19	36	242	74	**371**

In all three claim year groupings, the female mortality ratios tend to increase as the elimination periods increase. The mortality ratios generally decrease by claim year with the 30-day elimination period being an exception.

Table 7.13 compares the female Actual/Standard Mortality Ratios by claim duration and elimination period for all occupation classes combined and cancer only.

Table 7.13

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND ELIMINATION PERIOD FOR CANCER ONLY, ALL OCCUPATION CLASSES COMBINED

Claim Year	ACTUAL/STANDARD MORTALITY RATIO					NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1	3913%	5565%	7178%	9909%	**6997%**	28	46	384	83	**542**
Years 2-6	6317%	6455%	5259%	7222%	**5757%**	68	106	699	240	**1,113**
Years 7-10		2427%	1729%	1969%	**1830%**	3	15	82	22	**123**

The female cancer mortality ratios in claim year 1 increase as the elimination period increases, but do not increase consistently by elimination period in years 2-6 and years 7-10. The female cancer mortality ratios decrease by claim year for the 90-day and 180-day elimination periods but increase in years 2-6 for the lower elimination periods.

Table 7.14 compares the female mortality ratios by claim duration and elimination period for all occupation classes and non-cancer, non-maternity Diagnosis Groupings combined.

Table 7.14

FEMALE ACTUAL/STANDARD MORTALITY RATIOS BY CLAIM YEAR AND ELIMINATION PERIOD FOR ALL OCCUPATION CLASSES AND NON-CANCER, NON-MATERNITY DIAGNOSIS GROUPINGS COMBINED

Claim Year	ACTUAL/STANDARD MORTALITY RATIO					NUMBER OF DEATHS				
	30-Day	60-Day	90-Day	180-Day	Total	30-Day	60-Day	90-Day	180-Day	Total
Year 1		205%	358%	704%	**348%**	4	7	68	24	**102**
Years 2-6	396%	238%	279%	420%	**313%**	46	35	264	133	**479**
Years 7-10	181%	195%	266%	310%	**258%**	16	21	160	52	**248**

The female mortality ratios for all non-cancer Diagnosis Groupings combined tend to decrease by claim year, although this is more apparent for elimination periods 90-day and 180-day. The level of mortality ratios for the non-cancer Diagnosis Groupings combined appear to not vary as much by claim year and elimination period as observed for all non-maternity Diagnosis Groupings combined and cancer only.

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IDEC Members:

Jay Barriss, FSA, MAAA (Chair)

Tasha Khan, FSA, MAAA (Vice Chair)

Viresh Bawa, FSA, MAAA, CERA

Robert Beal, FSA, MAAA

Jordan Cadorette, FSA, MAAA

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Daniel Sim, FSA, MAAA

Robert Spangler, FSA

Jonah Yearick, FSA, MAAA, CERA

Ying Zhou, FSA, MAAA, CERA

At the Society of Actuaries Research Institute

Korrel Crawford, Senior Research Administrator

Pete Miller, ASA, MAAA, Experience Studies Actuary

Appendix A Definition of Diagnosis Groupings

Table A.1 defines the various Diagnosis Groupings by their ICD-9 codes. Table A.2 lists a sample of conditions falling in the 15 Diagnosis Groupings. This list is provided to give the reader an understanding of the types of conditions that are included in the Diagnosis Groupings. However, this list of conditions is not exhaustive.

Table A.1

ICD-9 CODES FOR DIAGNOSIS GROUPINGS

Diagnosis Groupings	3-Digit ICD-9 Codes
Alcohol & drug	291, 292, 303, 304
Back	720-724, 737, 805, 806, 847, 952
Cancer	140-165, 170-176, 179-209, 230-239
Circulatory	280-289. 390-398, 401-405, 410-417, 420-438, 440-449, 451-459
Diabetes	250
Digestive	520-543, 550-560, 562, 564-579
Ill-defined and misc. conditions	780-799
Infectious diseases	001-004, 011-118, 120-139, 279
Injuries other than back	800-804, 807-846, 848-854, 860-887, 890-897, 900-979, E000-E030, E800-E888, E990-E999, NOIN
Maternity	630-679, 760-779
Mental & nervous	290, 293-319
Nervous system	320-327, 330, 359
Other conditions	210-229, 240-246, 249, 251-278, 360-389, 580-629, 680-686, 690-698, 700-709, 740-759, 980-999
Other musculoskeletal	710-719, 725-739
Respiratory	460-466, 470-478, 480-488, 490-496, 500-508, 510-519

Table A.2

SAMPLE CONDITIONS WITHIN EACH DIAGNOSIS GROUPING

The lists of conditions below are not complete but are intended to provide a representative sample of the conditions that fall within each Diagnosis Grouping.

DIAGNOSIS GROUPING	SAMPLE CONDITIONS
Alcohol & drug	Alcohol withdrawal delirium
	Drug-induced mental disorders
	Acute alcoholic intoxication in alcoholism, unspecified
	Opioid-type dependence, unspecified use
Back	Ankylosing spondylitis and other inflammatory spondylopathies
	Spondylosis and allied disorders
	Intervertebral disc disorders
	Chronic lumbosacral sprain/strain
	Curvature of spine
	Fracture of neck, unspecified
	Neck sprain
	Unspecified injury of cervical spinal cord
Cancer	Malignant neoplasm
Circulatory	Diseases of the blood and blood-forming organs
	Rheumatic fever and rheumatic heart disease
	Hypertensive disease
	Myocardial infarction; angina pectori
	Other forms of heart disease
	Cerebrovascular disease
Diabetes	Diabetes - types 1 and 2, not secondary diabetes
Digestive	Diseases of oral cavity, salivary glands, and jaw
	Diseases of esophagus, stomach, and duodenum
	Appendicitis
	Hernia of abdominal cavity
	Noninfectious enteritis and colitis
	Other diseases of intestine
Ill-defined and miscellaneous conditions	Symptoms, signs, and ill-defined conditions
	Coma, hallucinations, dizziness, lack of coordination, symptoms involving skin, anorexia, septic shock
Infectious Diseases	Intestinal infectious diseases (e.g., cholera, typhoid fever, salmonella)
	Tuberculosis
	Polio, other infectious and parasitic diseases
	Immunodeficiency
Injuries other than back	Fractures
	Sprains, strains
	Concussion, cerebral laceration
	Internal injury of thorax, abdomen, and pelvis
	Open wounds
	Injury to nerves and spinal cord
	Burns
	Poisoning
	Late effects of injury, poisoning
	Accidental falls

Table A.2

SAMPLE CONDITIONS WITHIN EACH DIAGNOSIS GROUPING, CONTINUED

DIAGNOSIS GROUPING	SAMPLE CONDITIONS
Maternity	Complications of pregnancy, childbirth, and puerperium
	Certain conditions originating in the perinatal period
Mental & nervous	Dementia
	Psychotic conditions, excludes senility, alcohol, and drug psychoses
	Schizophrenia
	Paranoia
	Neurotic and personality disorders
Nervous system	Meningitis
	Encephalitis myelitis and encephalomyelitis
	Intracranial and intraspinal abscess
	Phlebitis and thrombophlebitis of intracranial venous sinuses
	Organic sleep disorders
	Cerebral degeneration
	Muscular dystrophies and other myopathies
	Amyotrophic lateral sclerosis
	Multiple sclerosis
	Epilepsy
Other conditions	Benign neoplasms
	Disorders of thyroid gland
	Secondary diabetes
	Disorders of pancreas, parathyroid, pituitary glands
	Ovarian and testicular disorders
	Nutritional deficiencies
	Other metabolic disorders, e.g., gout, obesity
	Disorders of the eye and ears
	Diseases of the genitourinary system
	Diseases of the skin
	Congenital anomalies
	Toxic effects of substances
	Radiation, heat stroke
Other musculoskeletal	Arthropathies, e.g., osteoarthritis and related disorders
	Rheumatism
	Disorders of muscle, ligament, and fascia
	Other disorders of soft tissues
	Osteopathies, chondroplasties, and acquired musculoskeletal deformities
Respiratory	Acute nasopharyngitis (common cold), acute sinusitis; acute pharyngitis; acute tonsillitis; acute laryngitis and tracheitis
	Diseases of upper respiratory tract
	Pneumonia, influenza
	Bronchitis, chronic bronchitis, emphysema
	Pneumoconioses and other lung diseases
	Pleurisy

Appendix B Aggregate Recovery Rates for 90-day Elimination Period and To Age 65-70 Benefit Period

Tables B-1 (Male) and B-2 (Female) provide the Aggregate Monthly Recovery Rates (per 1,000) used to derive the Aggregate Recoveries for the Actual/Aggregate Recovery Ratios in Sections 4 and 5. These recovery rates vary by sex, claim duration, and onset age. They are based on claims with a 90-day elimination period and To Age 65-70 benefit period and combined all occupation classes and non-maternity Diagnosis Groupings.

Table B-1

MALE AGGREGATE (MONTHLY) RECOVERY RATES PER 1,000 BY ONSET AGE AND CLAIM DURATION GROUPING

CLAIM DURATION	MALE AGGREGATE RECOVERY RATES				Number of MALE Recoveries				
	Under 40	40-49	50-59	60-64	Under 40	40-49	50-59	60-64	Total
1	59.95	44.89	32.56	23.91	1,205	3,060	4,427	1,312	**10,004**
2	19.61	15.37	9.44	7.03	330	980	1,269	382	**2,961**
3	9.20	6.05	3.13	2.05	116	319	357	81	**873**
4	5.73	3.74	1.54	1.73	61	183	189	45	**478**
5	3.87	2.64	0.80	1.44	39	127	67	20	**253**
6	2.56	1.69	0.75	1.25	26	80	53	5	**164**
7	1.51	0.89	0.49		16	38	59		**113**
8	1.10	0.71	0.49		11	39	31		**81**
9	1.00	0.54	0.49		11	30	14		**55**
10	0.73	0.48	0.48		8	14	22		**44**
Total					**1,823**	**4,870**	**6,488**	**1,845**	15,026

Table B-2

FEMALE AGGREGATE (MONTHLY) RECOVERY RATES PER 1,000 BY ONSET AGE AND CLAIM DURATION GROUPING

CLAIM DURATION	FEMALE AGGREGATE RECOVERY RATES				Number of FEMALE Recoveries				
	Under 40	40-49	50-59	60-64	Under 40	40-49	50-59	60-64	Total
1	59.42	44.55	35.76	30.66	1,080	1,729	1,888	414	**5,111**
2	21.48	15.45	10.41	6.13	327	581	544	78	**1,530**
3	8.43	7.69	4.03	3.22	104	247	181	29	**561**
4	3.85	2.70	1.79	1.73	49	96	72	11	**228**
5	2.09	2.00	0.96	1.26	23	45	35	4	**107**
6	1.99	1.78	0.72	1.26	17	54	25	1	**97**
7	1.77	1.08	0.91		20	31	28		**79**
8	1.24	0.67	0.29		14	19	8		**41**
9	0.88	0.60	0.12		10	16	3		**29**
10	0.42	0.46	0.12		5	12	2		**19**
Total					**1,649**	**2,830**	**2,786**	**537**	7,802

Appendix C Mortality Rates in the Ultimate Policy Years from the 2015 Valuation Basic Table

Table C-1 provides the nonsmoker, ultimate policy duration mortality rates per 1,000 from the 2015 Valuation Basic Table used to derive Standard recoveries for the Actual/Standard Mortality Ratios in Sections 6 and 7.

Table C-1

2015 VBT MORTALITY RATES – NONSMOKER, ULTIMATE POLICY DURATIONS PER 1,000

Attained Age	Mortality Rates / 1000		Attained Age	Mortality Rates / 1000	
	Male	Female		Male	Female
25	0.88	0.36	45	2.19	1.21
26	0.87	0.35	46	2.25	1.31
27	0.86	0.35	47	2.30	1.41
28	0.84	0.36	48	2.36	1.52
29	0.84	0.38	49	2.45	1.64
30	0.86	0.41	50	2.57	1.78
31	0.90	0.44	51	2.72	1.94
32	0.97	0.48	52	2.90	2.11
33	1.05	0.52	53	3.10	2.30
34	1.13	0.57	54	3.34	2.51
35	1.23	0.64	55	3.62	2.74
36	1.33	0.72	56	3.93	3.00
37	1.44	0.80	57	4.29	3.30
38	1.55	0.87	58	4.71	3.63
39	1.67	0.93	59	5.19	4.01
40	1.81	0.98	60	5.75	4.43
41	1.93	1.02	61	6.38	4.92
42	2.02	1.06	62	7.09	5.46
43	2.07	1.10	63	7.89	6.08
44	2.13	1.14	64	8.75	6.76

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Society of Actuaries Research Institute
8770 W Bryn Mawr Ave, Suite 1000
Chicago, IL 60631
www.SOA.org