

Discussion of Gender-Based Rating in the Individual Disability Market

Prepared For: The Life Insurance Association of Massachusetts

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Section 1: Introduction

This paper discusses the individual disability insurance market, common pricing methods in this market and their actuarial basis, industry data regarding gender differences, and potential implications of requiring unisex rating for these types of policies. In developing this analysis, we have relied on information from publicly available sources such as company rating manuals and industry reports, as documented in this report. To the extent that any of this information is inaccurate or incomplete, the results of our analysis may be materially affected.

This information has been compiled at the request of the Life Insurance Association of Massachusetts (LIAM), for the purpose of supporting its evaluation of gender-specific rating in the individual disability market. Except as set forth below, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit any third party recipient of its work, even if Milliman consents to the release of its work to a third party. Milliman hereby consents to LIAM providing a copy of the final, non-draft version of the white paper, in its entirety, to the Working Group, the LIAM and American Council of Life Insurers (ACLI) members, the Commonwealth of Massachusetts and the Massachusetts legislature; provided, however, that the parties agree Milliman does not intend to benefit, and owes no duty to, the Working Group, the LIAM and ACLI members, the Commonwealth of Massachusetts and the Massachusetts legislature.

As described in this report, the potential impact of unisex rating on the individual disability insurance market has been explored using hypothetical scenarios and estimates regarding future experience. It is highly likely that future experience will not conform to these assumptions, meaning the actual impact of unisex rating will be different from what is presented in the hypothetical scenarios discussed in this report.

I, Tasha S. Khan, am a consulting actuary for Milliman Inc. I am a member of the American Academy of Actuaries and I meet the qualifications standards of the Academy to render the actuarial opinion contained herein.

Section 2: Executive Summary

This report discusses the experience basis as well as the actuarial basis for sex-distinct rating in the individual disability insurance (IDI) market, along with potential implications of unisex rating. This section contains a summary of the key points that are discussed in greater detail in other sections of this report.

- Insurers use risk characteristics such as age, gender and occupation class to determine the appropriate premium rate for IDI coverage. The use of risk characteristics is consistent with Actuarial Standards of Practice (ASOPs), and allows the premium to match the underlying risk as closely as possible, which minimizes adverse selection.
- The industry experience reflected in the newest industry table (2013 IDI Valuation Table) demonstrates significant differences in disability claim costs by gender.
- Unisex pricing is used with other disability products where the underlying gender distribution can be calculated with a reasonable degree of confidence.
- Requiring unisex IDI pricing in all markets will cause premiums to be out of line with the underlying risk. In general, premiums for males will be higher than what is needed to cover male claim costs and premiums for females will be lower. Unisex premiums charged to males will therefore be used to subsidize premiums for females. This mismatch is likely to increase adverse selection and may cause plan demographics to shift and overall premiums for IDI coverage to increase.
- Due to the uncertainty of the gender distribution, companies might include additional margin in their unisex pricing methods, which could also cause premiums to increase.

Section 3: Background on Individual Disability Insurance

IDI is designed to protect working people from the risk of losing their income due to illness or injury. When a policyholder becomes disabled, he or she will receive a benefit payment each month to replace a portion of lost income. There are no restrictions on how the monthly benefit payments are used by the disabled policyholder (or “claimant”). The definition of what constitutes a disability and therefore when a policyholder is eligible for benefits varies depending on the type of policy purchased. Some policies require that the policyholder be totally disabled, meaning unable to work for any length of time. Other policies allow for partial disability, which means that the claimant is able to work only part-time and/or has suffered a particular level of income loss due to disability.

The IDI policy will specify certain basic policy provisions including the following:

Elimination Period: The waiting period between when the disability first occurs and when benefits begin. Common elimination periods are 90 and 180 days.

Benefit Period: The maximum length of time for which benefits are payable. Common benefit periods are two years, five years, and To Age 65.

Monthly Indemnity: This is the monthly benefit amount payable under the policy.

Renewability: IDI policies are most often guaranteed renewable or noncancelable. If a policy is **guaranteed renewable**, the premiums for a class of current policyholders may be changed if experience for that class is significantly different from what was assumed when the premium rates were developed. For **noncancelable** policies, the premium rates for current policyholders cannot be changed for the life of the policy. Most of the IDI business sold in the U.S. is noncancelable (83% of new premium in 2015¹).

Current Pricing Methods for IDI

When developing premiums for their IDI business, insurers generally use experience from their own block of individual disability business, sometimes combined with data from industry-wide experience studies. Premium rates for IDI policies generally vary by issue age, gender, occupation class, benefit amount, smoker status, geographic area and policy provisions. In general, premium rates for individual coverages such as IDI are designed to match the underlying risk as closely as possible. The rating variables are selected with this goal in mind, meaning they have been shown to have a significant impact on disability costs. Matching the premium rates as closely as possible to the underlying cost helps to control adverse selection.

¹ Robert Beal, “2016 Annual Survey of the U.S. Individual Disability Income Insurance Market” (September 16, 2016) <http://www.milliman.com/uploadedFiles/insight/2016/Milliman-IDI-market-survey-2016.pdf>. This study does not include “worksites disability” policies that offer simplified benefits and are sold using payroll deduction methods.

Adverse selection occurs when premiums charged for a coverage do not line up well with the underlying risk. For example, if a particular plan charges the same premium regardless of age, and if costs increase with age, then the coverage is a better deal for older individuals who are subsidized by younger individuals. It is therefore likely that a higher proportion of older people would purchase this coverage, which increases the average cost of the plan. As discussed in a later section of this report, disability cost varies significantly by gender. Using separate rating classes for males and females therefore produces a closer match between expected costs and premiums.

Premium rates are developed by first calculating the expected **claim costs** for the policy. The claim cost is the expected total benefit to be paid out to policyholders for disability claims. Claim costs are developed for each pricing cell, which is to say each combination of rating variables such as elimination period, benefit period, issue age, gender, etc. These claim costs are then increased to cover additional costs such as overhead expenses, commissions, policy and claim management expenses, taxes, risk margin and company profit.

Examples of Unisex Disability Pricing

Disability coverage in the group market is typically priced on a unisex basis. Claim costs for group disability vary by gender, similarly to IDI, so the underlying premium structure for group disability also varies by gender. Before calculating a rate for a particular case, however, the carrier will be provided with census data containing information on all lives eligible for coverage under the policy. The carrier will then use this data to determine the gender distribution for the group and will reflect this distribution in the quoted rate. Thus, the unisex premium rate for a group case is based on the known gender distribution of the population being covered.

Within the IDI market, carriers may sell certain policies which are sponsored by employers and purchased by three or more of its employees. Carriers typically provide unisex premium rates for this employer-sponsored disability coverage. Because this type of coverage is initiated and endorsed by the employer, carriers provide rates on a unisex basis in order to ensure that the coverage does not constitute discrimination in employment. Carriers generally receive a census of eligible lives, similar to group disability, in order to determine the underlying gender distribution. Carriers will also require a particular level of participation in the plan in order to mitigate the risk of adverse selection.

Section 4: Industry Data on Gender Differences

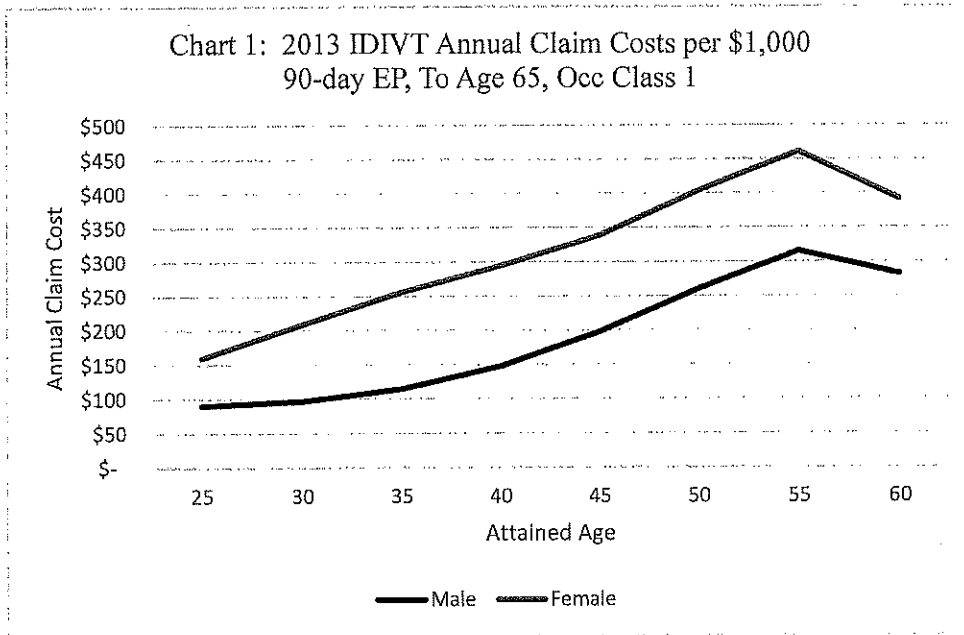
Differences in IDI claim costs by gender have been noted since the 1980s with the development of the 1985 Commissioners' Group Disability Table A (1985 CIDA). The most recent published industry table reflecting experience in the IDI market is the 2013 Individual Disability Valuation Table (2013 IDIVT). This table reflects industry experience from January 1, 1990 through December 31, 2007, and has been adopted by the National Association of Insurance Commissioners as the minimum valuation standard for individual disability business beginning in 2020. Based on sales data, the companies that contributed data used in the development of this table represent approximately 90% of the IDI market in the United States².

The table and corresponding graph below compare expected annual claim costs for males and females. These claim costs were generated using the spreadsheet³ created by the Individual Disability Tables Working Group, a joint committee of the Society of Actuaries and the American Academy of Actuaries formed to develop the 2013 IDIVT. The values assume an elimination period of 90 days, benefit period of To Age 65, interest rate of 3%, occupation class 1 (white collar), no margins, and an average industry mix of smokers and nonsmokers.

Attained Age	Male	Female	Ratio
25	\$90.19	\$159.87	177%
30	\$96.81	\$208.26	215%
35	\$114.44	\$255.96	224%
40	\$147.31	\$294.75	200%
45	\$197.65	\$338.39	171%
50	\$259.76	\$404.15	156%
55	\$315.61	\$461.42	146%
60	\$282.01	\$391.81	139%

² "Individual Disability Valuation Standard Report of the Joint American Academy of Actuaries/Society of Actuaries Individual Disability Tables Work Group," American Academy of Actuaries, www.actuary.org (December 2015)

³ 2013 IDI Valuation Table Workbook Version 1.3.xlsm, American Academy of Actuaries, www.actuary.org



The table and chart above show that female claim costs are significantly higher than male claim costs, with female costs generally more than double male costs between ages 30 and 40. The pattern of gender differences for other occupation classes and policy provisions is substantially similar, with some variability for occupation class M (medical occupations). Additional charts comparing male and female claim costs are included in Appendix A.

Section 5: Actuarial Basis for Sex-Distinct Rating

The use of gender as a factor in developing IDI premium rates falls under the more general issue of risk classification systems. This and other aspects of actuarial practice are governed by the Actuarial Standards of Practice (ASOPs) developed by the Actuarial Standards Board (ASB). The ASB is a committee whose members are appointed by the presidents and presidents-elect of the major actuarial organizations in the United States.⁴ The ASOPs developed by the ASB provide practicing actuaries with guidance on specific practice areas, including appropriate procedures, techniques, and approaches. The Code of Professional Conduct⁵ for members of the American Academy of Actuaries requires actuaries to ensure that their work satisfies these standards of practice. The ASOPs are also intended to provide other audiences, such as the general public and insurance regulators, with assurance that actuaries are professionally accountable for the work and that their work is performed in the public interest. The ASOPs provide appropriate and useful guidance on what constitutes sound actuarial principles.

Actuarial Standard of Practice No. 12, “Risk Classification (for All Practice Areas)” provides actuaries with guidance on performing professional services “with respect to designing, reviewing, or changing risk classification systems.” It begins by providing general definitions of a risk classification system and the risk characteristics on which such a system is based:

- A “risk classification system” is defined as “a system used to assign risks to groups based upon the expected cost or benefit of the coverage or services provided.”
- “**Risk characteristics**” are defined as “measurable or observable factors or characteristics that are used to assign each risk to one of the risk classes of a risk classification system.”

A risk classification system most often refers to underwriting rules and/or premium structures. ASOP 12 identifies seven considerations in the selection of risk characteristics (in this case, rating variables). These considerations are listed below, along with discussion of how gender as a rating variable satisfies each condition.

1. Relationship of risk characteristics and expected outcomes: *“A relationship between a risk characteristic and an expected outcome, such as cost, is demonstrated if it can be shown that the variation in actual or reasonably anticipated experience correlates to the risk characteristic.”* As documented in this report, the expected cost of IDI claims is significantly different for males and females, demonstrating a relationship between the risk characteristic and the expected outcomes.
2. Causality: *“While the actuary should select risk characteristics that are related to expected outcomes, it is not necessary for the actuary to establish a cause and effect relationship between the risk characteristic and expected outcome in order to use a specific risk characteristic.”* It is not necessary to demonstrate a cause and effect relationship between gender and the expected outcome; it suffices to demonstrate the relationship

⁴ <http://www.actuarialstandardsboard.org/aboutasb.asp>

⁵ <https://www.actuary.org/content/code-professional-conduct>

between the characteristic and the outcomes. That relationship is discussed in Section 4 of this report.

3. Objectivity: *"A risk characteristic is objectively determinable if it is based on readily verifiable observable facts that cannot be easily manipulated."* The risk characteristic of gender can be objectively determined.
4. Practicality: *"The actuary's selection of a risk characteristic should reflect the tradeoffs between practical and other relevant considerations."* The risk characteristic is practical to evaluate due to the ready availability of gender information.
5. Applicable Law: *"The actuary should consider whether compliance with applicable law creates significant limitations on the choice of risk characteristics."* There is not currently any law in Massachusetts which prohibits the use of gender as a risk characteristic.
6. Industry Practices: *"The actuary should consider usual and customary risk classification practices for the type of financial or personal security system under consideration."* It is a usual and customary practice for disability carriers to vary IDI premium rates by gender in Massachusetts and most other states.
7. Business Practices: *"The actuary should consider limitations created by business practices related to the financial or personal security system as known to the actuary and consider whether such limitations are likely to have a significant impact on the risk classification system."* There are no business practices that pose obstacles to the use of gender as a rating variable, since the risk characteristic can be readily evaluated by underwriters and the rating variable can be applied efficiently and effectively.

ASOP 12 also identifies several considerations in establishing risk classes based on risk characteristics. These considerations are listed below, along with discussion of how gender as a rating variable satisfies each consideration.

1. Intended Use: *"The actuary should select a risk classification system that is appropriate for the intended use. Different sets of risk classes may be appropriate for different purposes."* The use of gender as a rating variable is appropriate because it allows the premium rate charged for the coverage to be more closely aligned with expected benefit costs.
2. Actuarial Considerations: *The actuary should consider the inter-related effects of adverse selection (which is likely to occur "if the variation of expected outcomes within a risk class is too great"), credibility (by attempting to design classes "large enough to allow credible statistical inferences regarding expected outcomes"), and practicality (by "balancing the potentially conflicting objectives of accuracy and efficiency, as well as in minimizing the potential effects of adverse selection.")* First, the use of gender as a rating variable helps control adverse selection by minimizing the variability of experience within each risk class. Since claim cost experience varies significantly by gender, using separate risk classes for males and females produces a closer match between expected claim costs and premiums.

Second, each risk class is large enough to have credible industry data available to allow statistical inferences on expected outcomes. Third, the objective and practical nature of the risk characteristic means that separate rating classes for males and females can be administered accurately and efficiently.

3. Other Considerations: *“The actuary should (a) comply with applicable law; (b) consider industry practices for that type of financial or personal security system as known to the actuary; and (c) consider limitations created by business practices of the financial or personal security system as known to the actuary.”* First, as set forth above, this risk classification system is permitted if it conforms to sound actuarial principles or reflects actual or reasonably anticipated experience which - as demonstrated in this report - these risk classification systems do. Second, it is common industry practice for disability plans to vary IDI premium rates by gender. Third, there are no business practices that pose obstacles to the use of gender as a rating variable, since the risk characteristic can be readily evaluated by claim examiners and the rating class can be applied efficiently and effectively.
4. Reasonableness of Results: *“The actuary should consider the reasonableness of the results that proceed from the intended use of the risk classes (for example, the consistency of the patterns of rates, values, or factors among risk classes).”* The use of gender as a rating variable produces the reasonable result that premiums are more closely aligned with the underlying risk.

The analysis above indicates that the use of gender as a rating variable satisfies all of the required considerations identified by ASOP 12, which together represent sound actuarial principles for the design of risk classification systems.

Section 6: Discussion of Unisex Pricing

This section discusses the potential impact of unisex pricing on all of the IDI market. While it is not possible to predict the impact of such a change with any degree of certainty, it is possible to make a reasonable estimate regarding likely adjustments and implications, and to estimate the impact of potential subsequent experience on company results. The first issue to consider is adverse selection risk. Since female disability costs are generally higher than male disability costs, IDI premiums would increase for most males and decrease for most females. Male premiums would effectively subsidize female premiums. If individuals were able to choose between a policy with unisex rates and a policy with sex-distinct rates, males would more often choose the policy with sex-distinct rates and females would most often choose the policy with unisex rates. If all policies marketed to a particular population were required to be unisex rated, then this mitigates some of this adverse selection risk. It is likely that more females and fewer males would purchase new disability policies than in the past, since some females who did not purchase an IDI policy because of the high price may find a unisex priced policy to be affordable. Likewise, some males may decide not to purchase a unisex priced policy due to the higher cost. The extent that the distribution by gender shifts more to females as the result of unisex pricing is difficult to estimate. However, it is reasonable to expect that the overall plan claim costs will increase due to a higher proportion of females, which would lead to higher overall premiums for a unisex priced IDI policy.

The change might also affect current, or inforce, business for the insurer. Depending on a policyholder's issue age and current age, it may be less expensive for healthy females to allow their current IDI policies to lapse and then purchase new policies with unisex rates. Expenses such as commissions are significantly higher for new policies than for older, established policies, so lapse rates are an important assumption for developing appropriate premium rates and projecting expected future financial health of IDI business. If significantly more females than expected terminate their policies, this could negatively impact the overall IDI block in the near term.

In order to calculate unisex premium rates, the expected claim costs would need to be blended for males and females, using an assumption regarding the expected proportion of males and females in the covered population. It would be difficult to base this assumption on historical distributions that reflect sex distinct pricing since the act of moving to unisex rates will likely change the gender mix. As an example, consider the following set of hypothetical premium rates. Please note that these are illustrative rates only, generated from average rates from several publicly available company rating manuals.

Table 2: Sample Annual IDI Premium Rates per \$1,000 of Monthly Indemnity 90 day EP, To Age 65 BP, Occ Class 1, Accident and Sickness		
Age	Male	Female
25	\$160.00	\$230.00
35	\$220.00	\$340.00
45	\$330.00	\$440.00
55	\$450.00	\$530.00

Table 3 below shows the unisex premium rates obtained for different assumptions for gender distribution.

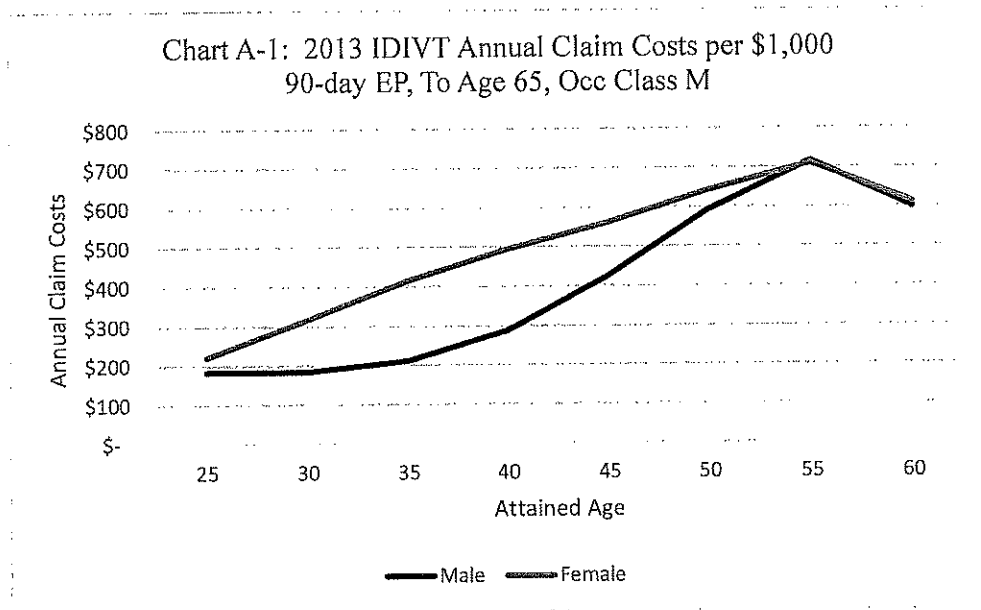
Table 3: Sample Annual IDI Premium Rates per \$1,000 of Monthly Indemnity (Unisex) 90 day EP, To Age 65 BP, Occ Class 1, Accident and Sickness			
Age	30% Female	40% Female	50% Female
25	\$181.00	\$188.00	\$195.00
35	\$256.00	\$268.00	\$280.00
45	\$363.00	\$374.00	\$385.00
55	\$474.00	\$482.00	\$490.00

Table 3 indicates that the unisex rates, as expected, are sensitive to the assumption for the gender distribution. If a company assumes that the covered population will consist of 30% females, and the actual proportion turns out to be 50% females, then using our sample premium calculations the coverage would be underpriced by 3-9%. Because over 80% of the IDI policies issued today are noncancelable, the premiums could not be changed for the life of the policy, which may be 30 years or more. In this case, the company could only recalculate its premium rates for future policyholders to correct the assumption. Over time, as the gender distribution data under unisex pricing emerges and stabilizes, companies would likely be able to develop a more appropriate assumption for the gender distribution for future business.

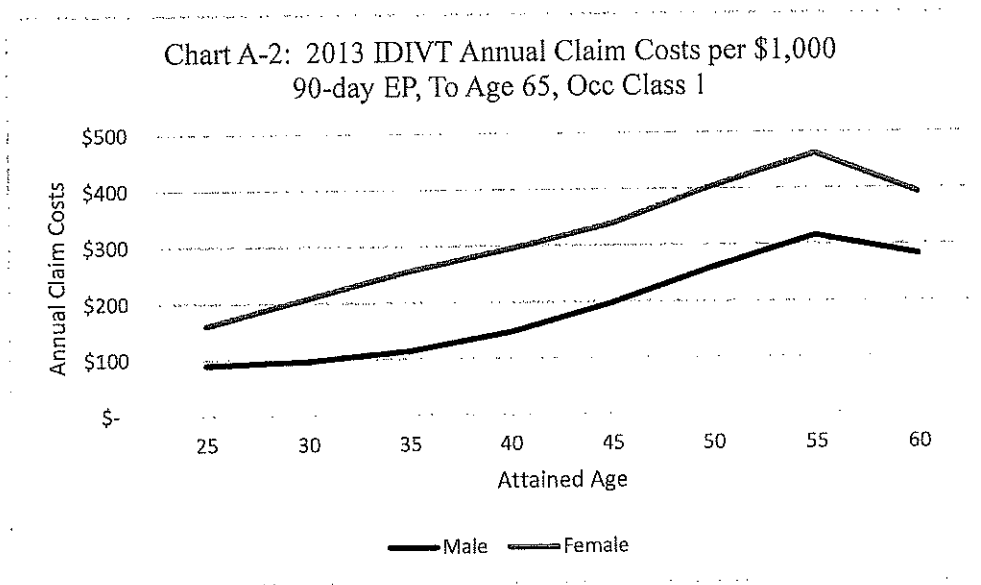
Since the gender distribution under unisex pricing is uncertain, and since the premium rates are sensitive to the gender distribution, conservatism would be necessary when developing this assumption. For example, if an actuary's best estimate is that future policyholders will be 30% female, it would be prudent to reflect an assumption of something greater than 30% in order to protect against uncertainty. If the company ultimately realizes a 30% proportion for females as expected, then premium rates will be set at something higher than what was needed. On average everyone would be paying more than before in order to protect against the additional uncertainty related to the gender distribution. Again over time, the company may alter premiums to reflect a best-estimate assumption for the gender distribution, when this distribution is shown to be relatively stable. Because the risk of mis-estimating the gender distribution remains, some level of conservatism may always be needed and reflected as an additional premium margin.

Appendix A: Industry Experience Additional Detail

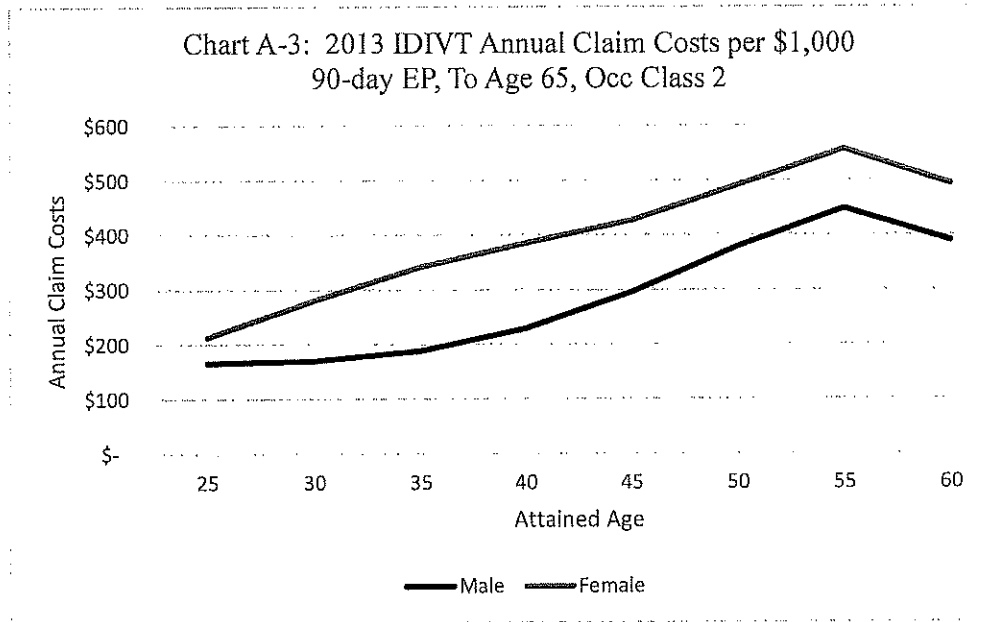
This section contains additional detail on gender differences observed in the IDI industry for different occupation classes and policy provisions.



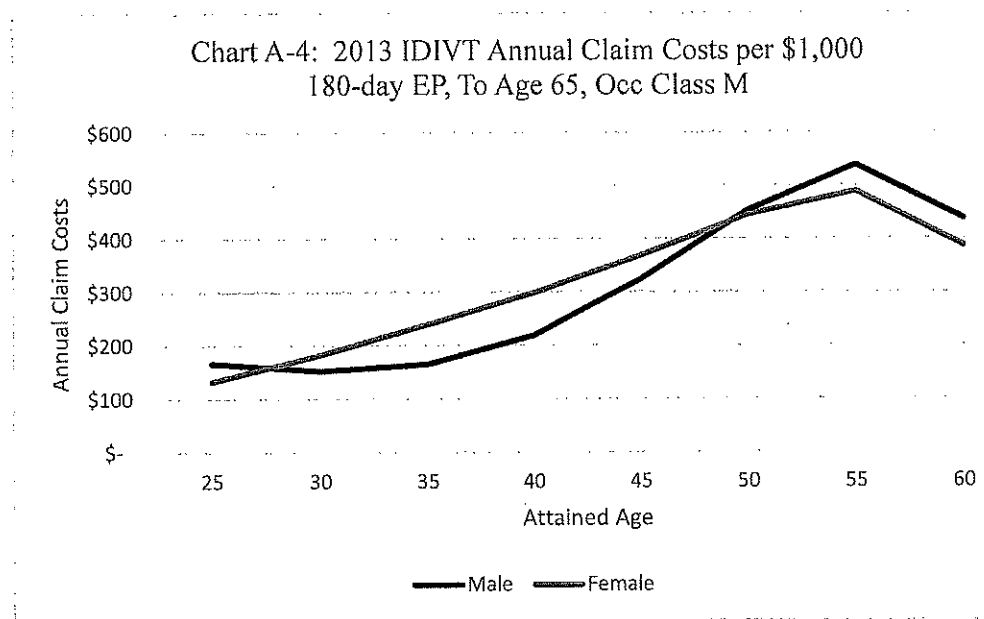
For occupation class M, which represents medical occupations, claim cost differences between males and females are much smaller at the youngest and oldest ages than for ages 30-50.



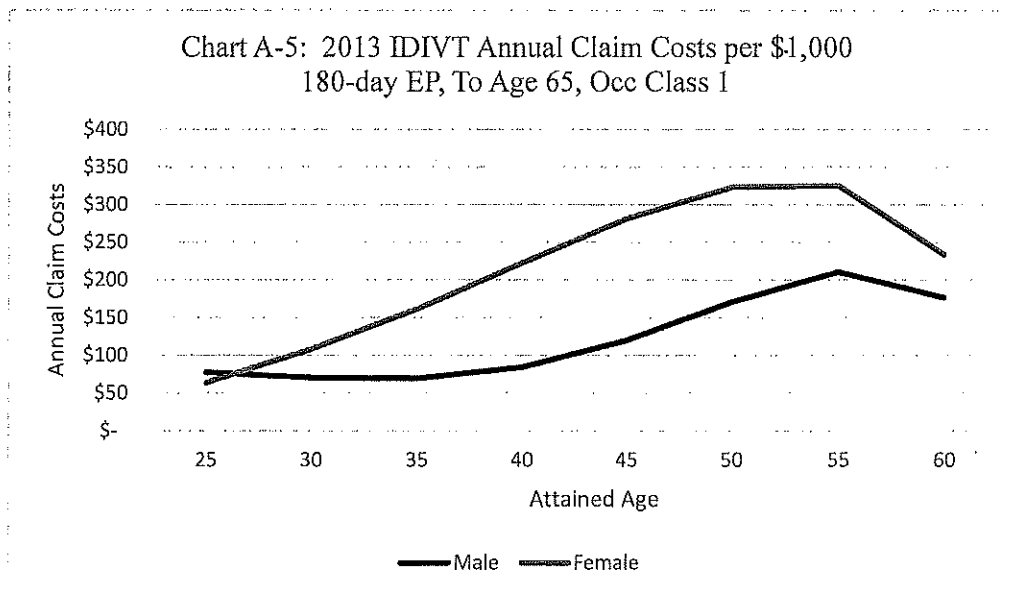
For occupation class 1, which represents non-medical white collar occupations, female claim costs are significantly higher than male claim costs at all ages.



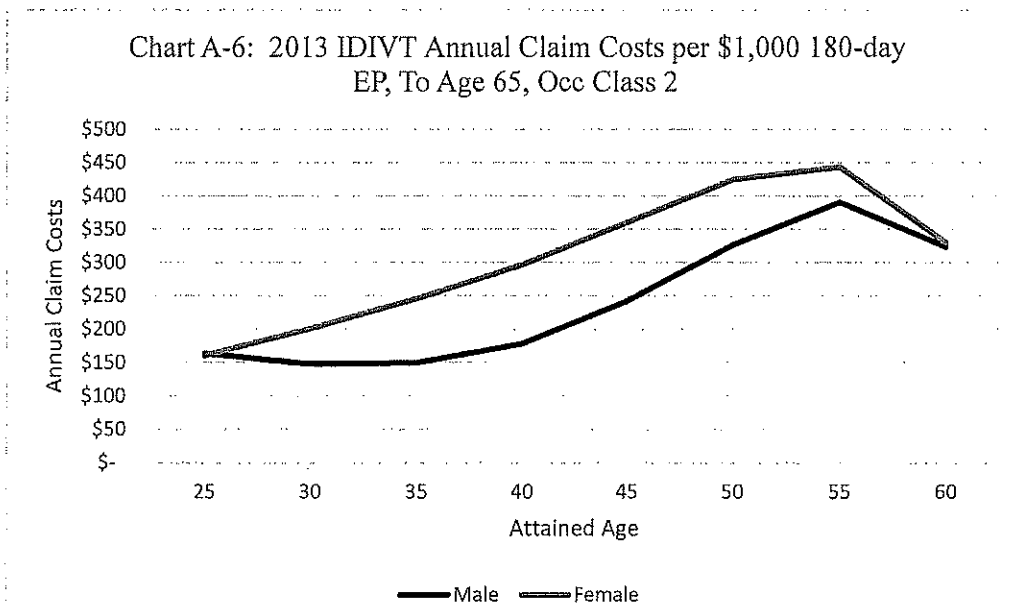
Claim cost differences by gender for occupation class 2, which represents skilled occupations with minimal manual duties, are similar to the differences observed for occupation class 1 in Chart A-2 above.



When moving to a longer elimination period, claim cost differences by gender decrease even further for occupation class M, with male claim costs exceeding female claim costs at the youngest and oldest ages.



For occupation class 1, there are again significant differences in annual claim costs for males and females. This gap narrows at the youngest and oldest ages.



The pattern for occupation class 2 seen above is similar to the pattern observed for occupation class 1.