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Accuracy of AVS Life Expectancy Reports

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Abstract

Life Settlements is an emerging industry which purchases life insurance policies from consumers who do not seem to have a need for them. As insureds age, the necessity of their life insurance policies decreases as the price of their premiums start to increase. As the demand for keeping an insurance policy decreases, many insureds have options in surrendering their policies to their respective insurance company for a financial incentive called a surrender value. While the surrender value may offer a nice incentive to insureds, life settlement companies are willing to purchase the insured's life insurance policy and offer a value higher than the surrender value in hopes of a financial gain while assuming the insured will pass relatively soon. Life Equity is a life settlement company in the market to purchase life insurance policies and they require the use of third-party underwriters to help them predict the length of an insured's survival which in turn will provide them with a possibility of financial gain. While Life Equity uses multiple underwriters such as: AVS, LSI, ISC, Fasano, and Predictive Resources, the main underwriter they use most frequently is AVS. The goal of my research is to see how accurate AVS' life expectancy reports are.

Introduction to Life Insurance

Over the course of a year I have had the pleasure of interning at Life Equity LLC where I have learned many aspects of the insurance world. Life Equity's main focus is in life insurance. "A life insurance policy is a contract with an insurance company. In exchange for premium payments, the insurance company provides a lump-sum payment, known as a death benefit, to beneficiaries upon the insured's death" (What Is Life Insurance, n.d.). Life insurance policies are purchased by individuals in order to provide a sense of security for their family or loved ones in case they were to pass away unexpectedly. When a life insurance policy is purchased, the face amount will determine the death benefit that a beneficiary is to receive in case the primary insured on the policy is to pass.

Typically, life insurance policies are purchased based on the goals of the owner. There are many different reasons as to why an insured may purchase a life insurance policy. One of the main reasons people purchase a life insurance policy is to replace lost income. The sudden death of a loved one can be tragic and having a life insurance policy can provide a sense of financial security for the family members left behind. This is especially true if the family solely relied on the income of the deceased insured (Lake, 2019). Having adequate coverage can provide your beneficiaries with a sense of relief knowing they will be able to stay financially afloat.

Another reason consumers purchase life insurance policies could be solely to cover funeral expenses. Funeral expenses can run upwards of thousands of dollars and being able to cover those expenses prior to death can reduce the financial burden for family members. While pre-paying for funeral expenses is not something people want to think about, it is something for individuals to consider and a life insurance policy may be able to provide that security (Lake, 2019).

When an individual passes away their debts may not vanish with them. Many people consider purchasing life insurance policies in order to help repay any outstanding debts that they may leave behind. An example of an outstanding debt would be a home mortgage loan. When the insured passes away, the financial responsibility to pay the mortgage relies solely on the insured's spouse. Having a life insurance policy can help pay for any outstanding debts the insured may have which will help reduce the financial burden on their loved ones (Lake, 2019).

While there are many different reasons as to why an insured may purchase a life insurance policy, there are many different types of life insurance policies an individual is able to decide from based on their needs. One type of life insurance policy is a term life policy. Term life policies provide temporary financial coverage for individuals, such as 10 to 20 years (What Is Life Insurance, n.d.). During the span of a term policy, the premium payments generally remain constant and the face amounts are lower. After the term policy expires, the insured has a possibility of renewing the policy but usually it comes with the expense of a higher premium payment. Term life policies are able to provide protection during an individual's working years while providing a sense of financial security for the insured's beneficiaries. Most term life policies also don't require a medical examination in order to be eligible for coverage. It is important to understand the proceeds of a term life policy are paid as a lump sum rather than multiple payments (What Is Life Insurance, n.d.).

Another more permanent type of life insurance policy is Universal Life. This policy type provides lifetime coverage for individuals; unlike term life which provides temporary protection. Universal life policies are also known as adjustable life insurance policies due to the flexibility they provide. Insured's have the ability to reduce, or increase, their death benefit and they are able to pay premium payments at any time and any amount under specific guidelines.

Unlike term life, universal life policies have two options for an insured's death benefit. The first option is a level death benefit. As premiums are paid, the fees and sale charges are reduced, and the remaining amount of the premium goes towards the cash value. The cash value of the policy increases as premiums are paid and the amount of insurance purchased each month decreases (Kagan, 2020). When the insured is deceased, the insurance company will be making payments to the beneficiary that are partially insurance and partially a return of the cash value.

The second option is an increasing death benefit. Unlike a level death benefit, when an insured makes a premium payment, the entire premium amount goes towards the cash value of the policy. Meaning when the insured is deceased, the beneficiary will receive the death benefit plus the amount of the cash value.

While considering which option is best for an insured, it generally boils down to the insured's age. Based on the article from Kagan, insureds under the age of 60 should opt for the increasing death benefit while insured's over the age of 60 should opt for the level death benefit. When an insured is over the age of 60, the level death benefit option is simpler as it is more cost effective. However, those in the higher income tax bracket should opt for the increasing death benefit option (Kagan, 2020).

Another permanent type of life insurance coverage is a Whole Life policy. Whole life policies are similar to universal life policies except they do not offer the same flexibility. With a whole life policy, an insured is required to pay the same premium amount for a specific period of time in order to receive the death benefit. As long as the insured is living, the policy will remain intact. A feature of a whole life policy is that it combines the insured's coverage with their savings. According to Dave, "Your insurance company puts part of your money into a high-interest bank account. With every premium payment, your cash value increases. This savings element of your policy builds up your cash value on a tax-deferred basis. In a way, the presence of guaranteed cash values makes this policy worthwhile because you can borrow against your cash value or surrender your policy to get the cash value" (Dave, 2020). While the cash value increases, the insured is also able to receive dividends through the surplus of the insurance company. The insured has a couple options when receiving their dividend payments, they are able to receive their dividends in cash, allow them to accumulate with interest, or they are able to use dividends to pay their insurance premiums or purchase additional coverage (Dave, 2020).

The last permanent type of insurance policy is a Variable Life insurance policy. Variable life insurance policies are quite different from the policy types mentioned above because they allow insureds to decide what portfolios they want to invest in. The death benefit is linked to how well the investment portfolio of an insured does. While the control is up to the insured, this is one of the riskier types of insurance policies because the insurer does not guarantee or protect against

any investment loss (Kagan, 2020). The insured must remain knowledgeable of the different investments and make sure they are able to maintain their portfolio. While each type of insurance policy can provide an insured safety, security, and help them reach their goals, each policy type offers different incentives that the insured will need to consider prior to purchasing a life insurance policy.

<u>Introduction to Life Settlements</u>

Life settlements is the field where a third-party company buys a pre-existing life insurance policy and pays the insured more than the cash surrender value of the life insurance policy but less than the total death benefit of the policy. According to Cussen (2020), "The cash surrender value in your life insurance policy is essentially the amount of cash that you can withdraw if you surrender your policy to your insurance company and allow it to lapse." Instead of receiving the cash surrender value from the insurance company, many insureds may be able to attain a higher pay out by selling their life insurance policy to a life settlement company.

Life settlements has been an emerging industry for over 100 years. When life insurance policies became more relevant, they were deemed on the same level as stocks and bonds ("The History of Life Insurance Settlements," n.d.) Many people would buy life insurance policies as a form of investment just like they would with stocks and bonds. Stocks and bonds have the ability to be traded and sold to other entities and companies for money and because life insurance policies were seen in the same category, insurance companies began buying and selling life insurance policies and thus creating this multi-billion-dollar business.

There are a multitude of reasons why an insured would be interested in selling their life insurance policy. One reason why an insured would be interested in selling their life insurance policy is because they may need to fund their retirement (Araujo, 2020). Life insurance premiums become very expensive as an insured's age increases and health deteriorates. Insurer's deem the insured as higher risk of passing so they will increase the insured's premiums in order to reduce the difference between the amount of the death benefit they must pay and the amount they received in premiums from the insured. Due to the increase in the premium, many insureds may not see the worth in keeping the policy and will sell the policy in order to obtain more cash for their retirement fund.

Another reason an insured would sell their life insurance policy is because they may not be able to afford it. The increase in premiums may become cumbersome for an insured and their best option is selling their insurance policy. If an insured is not able to pay their premium, they may risk losing the policy and thus losing any form of compensation they would be able to attain by selling their policy. While selling an insurance policy may seem simple, it takes time. In that time, the insured needs to make sure they are able to afford the premium payments for the few months while the transaction is taking place.

Another reason why an insured may sell an insurance policy is simply because they do not want the coverage anymore. If an insured is able to determine that they do not have any dependents they are covering or their debts are not as extreme as they used to be, it would be more beneficial to sell the insurance policy (Anaujo, 2020). An insurance policy provides security and protection

for an insured's beneficiary in case of an early death. However, if the insured feels confident that their family is able to support themselves after their death, it may be time for the insured to sell their life insurance policy.

Both the life settlement company and the insured endure risk when discussing life settlements. The biggest risk is endured by the life settlement company because they buy a life insurance policy from an insured and the insured has a chance of living past the maturity period of the policy. The life settlement company keeps paying these premiums on the policy per year and if the insured doesn't die by the maturity date, they will not receive the death benefit and will have to settle for the cash surrender value of the policy which in turn means they may not be able to make a profit off the insured.

How Life Settlement Companies Determine Purchasing the Policy

Life settlement companies have strict guidelines as to how they determine whether to purchase an insured's life insurance policy. There are a few circumstances that may entice a life settlement company to purchase a life insurance policy. One factor is the age and health of the insured. The older an insured is, the more likely a life settlement company is in purchasing the policy. The age of the insured is important because that gives a good estimate as to how long they believe the insured is going to live. This allows them to estimate how many years they will have to pay the insured's premium prior to them being deceased. Obviously, the least amount of premium payment the better profit for the life settlement company.

Another factor life settlement companies focus on is the health of the insured. If an insured is deemed healthy and has no significant impairments, it is unlikely that a life settlement company will purchase their policy. The healthier the insured, the longer the insured is going to live meaning the more premiums the life settlement company is going to have to pay. The sweet spot for life settlement companies are insureds with serious health complications. The more likely the insured is going to die, the higher the chance that the life settlement company will purchase the policy. They know that they will be able to achieve a high profit and get the return of their investment faster.

The type of policy can also persuade life settlement companies in purchasing the policy. Some policies offer miraculous incentives that the company is able to use to their advantage while waiting for the insured to be deceased. Most policies, such as Universal, Whole, and Variable life, are permanent life insurance policies that will be intact until the death of the insured. Insurance policies such as Term life are temporary so life settlement companies take a risk in purchasing those policies because they are assuming the insured will be deceased before the expiration date of the policy. However, most term policies have an opportunity to be converted into a permanent policy type or they can be renewed which will keep the policy intact. Most term policies require the insured to convert at a certain age and the longer they wait, the higher the premium payments are going to be. Regardless of whether the policy is renewed or converted, the premiums will increase so the life settlement company will have to account for that.

The final reason why a life settlement company may purchase a life insurance policy is due to the face amount. Most policies have a face amount above $100,000 so the higher the face

amount/death benefit, the more likely the life settlement company will purchase the policy, given that they will be able to make a profit. When considering all the reasons mentioned, the older the insured, the worse the primary impairment, and the higher the face amount of a policy, the more likely a life settlement company will be attracted in purchasing the policy.

While these factors may be able to persuade a life settlement company in purchasing the policy, the main factor when purchasing the policy is the life expectancy of the insured. The life expectancy is determined by the use of medical records and pre-existing conditions which allow the life settlement company to get a rough estimate as to how long the insured is going to live. Through this, they will be able to determine the number of months they would have to pay the insured's premiums and thus they can assess how much they are willing to pay the insured for the policy while still maintaining a profit. Sometimes a life settlement company may determine that they won't be able to make a good enough profit, so they won't waste their time in purchasing the policy.

Life Expectancy Calculation Process

Life settlement companies have the option of having their own underwriting team determine the life expectancy report of an insured or they use a third-party company. Life Equity LLC uses third party underwriters for their life expectancy reports. The main underwriters they use are: 21st Services, AVS, Fasano, LSI, and Predictive Resources. Each underwriting company has created their own model as to how they predict the life expectancy of an insured. The underwriters have specific factors in predicting the life expectancy and Life Equity LLC may purchase reports from multiple companies in order to better assess the life expectancy prediction of an insured.

While each underwriter has their own set of mortality tables that they use to determine an insured's life expectancy, they all generally follow a specific guideline in order to create a life expectancy calculation. They first determine the age, sex, and race of the insured at the date of death. They then determine which base life table the insured is categorized in. According to ForensisGroup (2019), a base life table is "an appropriate life table to estimate an individual's life expectancy as if (s)he had the same overall health status as the U.S. general population for the same age, sex and race." After determining which table the insured is categorized in, the underwriter then determines any specific personal health factors and previous family health complications that may influence the life of the insured. They categorize the risk factors that would have the highest influence on the insured's life expectancy and use medical literature to create an approximate estimate for each risk factor. They then extract these estimates as mortality multipliers and apply them to the insured's selected base life table which ultimately calculates the insured's adjusted life expectancy. The mortality multipliers are also known as ratings, debts, and relative risk factors (ForensisGroup, 2019). These multipliers are basically what creates an accurate representation of the insured's life expectancy given which base life table they fall under.

When looking at the different multipliers, it is important to determine if the risk factors are related and contribute to the mortality risk. Risk factors fall under two different categories: unrelated risk factors and related risk factors. Unrelated risk factors are the factors that are

usually straightforward and do not have relation to one another. According to ForensisGroup, an example of unrelated risk factors would be crack cocaine use, bipolar disorder, and smoking two packs of cigarettes per day. In contrast, risk factors that would be considered related to one another are liver cirrhosis, several recent DUIs, and infection with Hepatitis C. Many risk factors are combined based on their relation to one another in order to assess their combined effect which will give a more accurate representation in the life expectancy report.

While each underwriter uses this method to create their life expectancy calculations, each underwriting company has different risks associated based on the mortality multipliers. The risks associated between certain impairments may have a higher mortality multiplier for one company as compared to another. Normally, when Life Equity LLC orders multiple life expectancy reports on the same insured, the reports show different estimations for the life expectancy. This occurs due to how risky one underwriter classifies an impairment on the insured's overall health or based on what impairments are deemed pertinent to the underwriting company.

AVS' Process

While Life Equity LLC works with multiple life expectancy underwriters, the main underwriter they use is AVS Underwriting, LLC. Based on the data collected, Life Equity LLC purchased the most life expectancy reports from AVS Underwriting, LLC. While each underwriter follows similar guidelines in their calculations, each company creates their own mortality table based on which medical impairments they deem to be the most influential to the insured's health. According to AVS Underwriting, LLC (2017), "Our method incorporates the best aspects of a medical evaluation and a debit/credit model used in the standard life insurance industry." The mortality multipliers explained above are what the debit/credit model entails.

In the literature provided by AVS Underwriting, LLC (2017), AVS underwrites reports on the current functional status of the insured without taking into consideration historical medical conditions that are not relevant to the insured today or current medical impairments that do not limit the functionality of the insured. After the medical records have been evaluated, the insured's file is sent to an underwriter for further evaluation where the underwriter will consider the insured's current medical impairments and overall functionality. According to AVS Underwriting, LLC (2017), "The multiple model system developed by and exclusive to AVS offers clients the most conservatively accurate evaluation available."

Due to AVS Underwriting, LLC being the prevalent underwriter used by Life Equity LLC, the goal is to determine how accurate the life expectancy reports are. As morbid as it may sound, the earlier an insured is deceased the higher the profit the life settlement companies are going to receive. Therefore, life settlement companies rely heavily on the accuracy of the life expectancy reports they acquire. As mentioned previously, Life Equity LLC purchases a plethora of reports from AVS. They rely on the accuracy of AVS Underwriting, LLC to provide them with a life expectancy report that is accurate for them to use when pricing the insured's policy in order of achieving the maximum profit. While not always accurate, the goal of the research is to determine how accurate AVS Underwriting, LLC is when conducting their life expectancy reports.

Data Collection

I have had the pleasure of working as an intern at Life Equity LLC which has provided me with access to all the insured's life expectancy reports. I was able to use Life Equity LLC's OnBase system and export the life expectancy reports into an excel file. I then categorized all the life expectancy reports into separate excel files based on the underwriter who conducted the report. After carefully examining the data, I decided that AVS was the company with the most amount of reports and decided to focus my attention on them; Life Equity LLC had 8,268 reports from AVS.

When I extracted the data from Life Equity LLC, the AVS reports in their system are all the AVS reports that they have ordered up to October 11th of 2019, the date I extracted the data. This means that there are reports for insured's who have not yet passed away. When looking at the data, I was given the insured's date of birth, date of death (if deceased prior to October 11, 2019), date of the life expectancy report, the mean months predicted by the underwriter, the insured's mortality rating, smoking status, primary impairment, and gender. From there I then calculated the number of days an insured was predicted to live based on the mean months predicted by the underwriter. I then calculated the expected date of death by adding the number of days an insured was predicted to live to the date of the life expectancy report. Finally, based on the insured's date of death, I calculated how long the insured has been alive or how early they died based on when they were expected to die.

One issue that I ran into was that from the 8,268 reports, I was able to conclude that there were only 1,377 insureds who were deceased. Based on the number of insured's that were deceased, I decided to check which primary impairments had the greatest number of cases in order to do my analysis. After splitting the primary impairments into multiple sheets, I realized that I would not have enough data from each primary impairment in order to conduct a thorough analysis.

In order to conduct my research, I assumed the date of death for each insured who has not passed away as the date I extracted my data, October 11, 2019, because this is the best estimate as to how much longer an insured has lived. However, I excluded the insured's who had an expected date of death past the file extraction date. Assume X, the length an insured has lived or how early an insured died based on the expected date of death, equals the date of death minus the expected date of death. If X is negative, it is good for the company because the insured has passed away earlier than the expected date of death which means Life Equity LLC has saved X years of premium payments. However, if X is positive, this is bad for the company. It shows that the insured has lived past their expected date of death and Life Equity LLC had to pay X years in premium payments which they did not account for. So, when we have the actual date of death, we are able to see both sides, X which is positive and X which is negative. However, the X positive side has an unfair disadvantage because the file was closed on October 11, 2019. So, when the date of death is estimated prior to October 11, 2019 and the date of death is not recorded, then we know that X was at least positive, X > (10/11/2019 - Date of Estimated Death). By including the date of death as October 11, 2019 for an insured who's expected date of death is prior to that date, we are able to reduce the disadvantage that X positive side has as much as we can. If we do not do anything about this, then X positive side is bound to lose. Then our estimate for X will be underestimated, giving the company falsely optimistic results.

After organizing the excel sheet in the manner explained above, I then separated the primary impairments in order to find the highest number of cases. I decided to focus my attention on the following primary impairments: Cancer, Coronary Artery Disease (CAD), Diabetes, and Elder. While the life expectancy report categorizes cancer as a specific type of cancer an insured has, I decided to group them all together due to the lack of cases between each specific type of cancer; I also did the same with insured's who suffered with Diabetes Type I and Diabetes Type II.

When conducting my analysis, I am going to separate each impairment into three distinct groups. Group A indicates the group of insureds whose date of death has been recorded. Group B indicates the group of insureds who were assumed to die on October 11, 2019 because their expected date of death was prior to the file extraction date of October 11, 2019. Finally, Group C indicates a combination of Group A and B which will tell us how accurate AVS Underwriting, LLC's reporting is based on the assumptions we made above.

## Data Analysis

Cancer: Group A
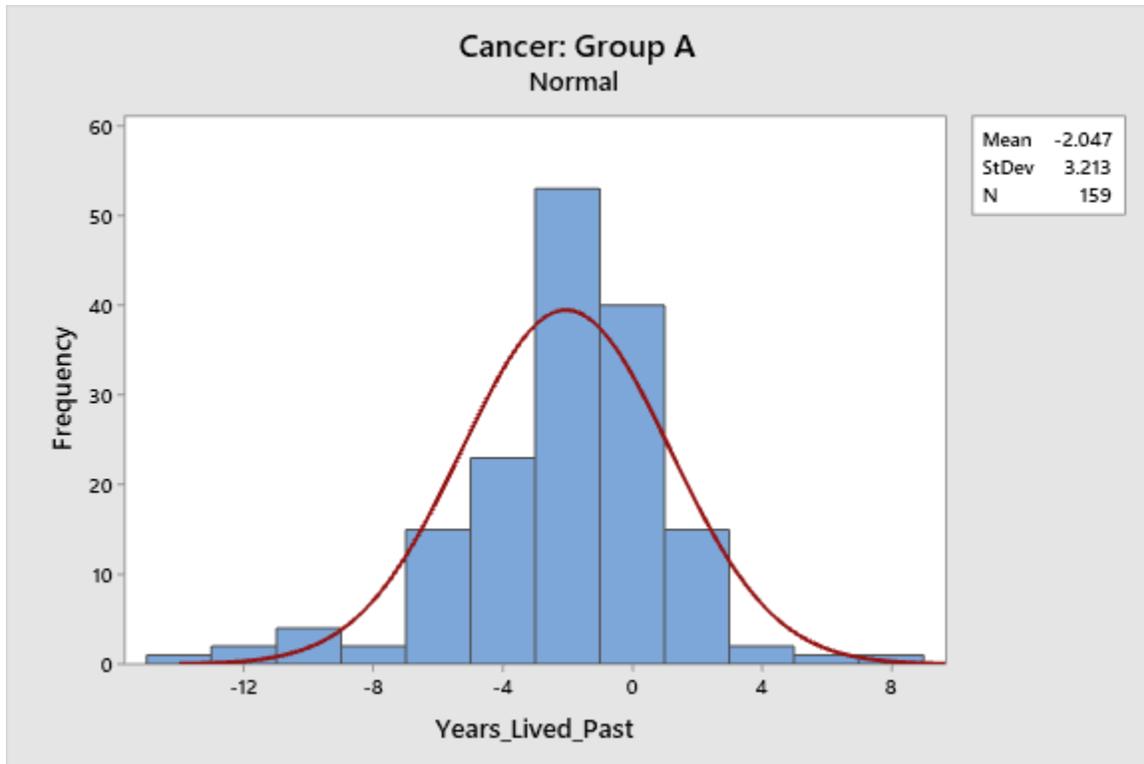
The average years is -2.047 which indicates that an insured, who actually died, with cancer tends to die 2.047 years earlier than what is estimated on their life expectancy report. We are able to conclude that Life Equity LLC can assume to save 2.047 years, or 24.566 months, of premium payments when an insured's primary impairment is cancer. Based on the histogram shown above, there is an approximately normal distribution. The standard deviation of 3.213 indicates that the values in the dataset tend to focus around the mean.

Cancer: Group B
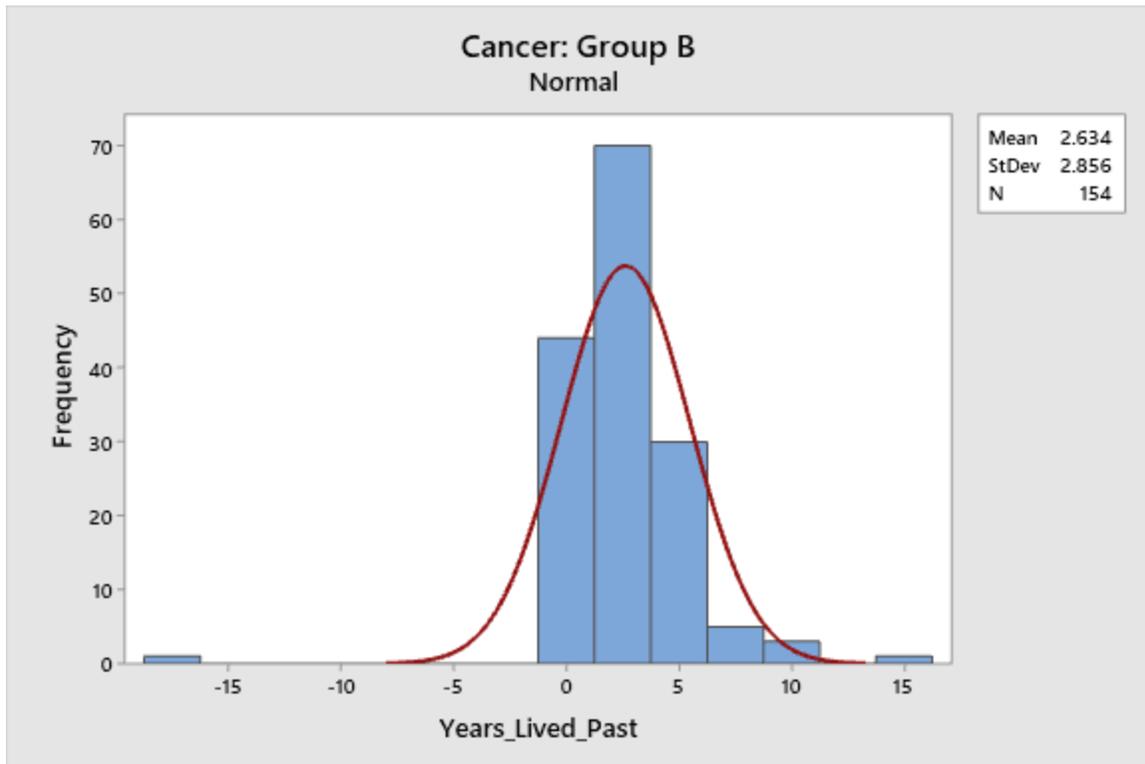
The average years is 2.634 which indicates that an insured, who we assumed passed away on October 11, 2019, with cancer tends to live 2.634 years in addition to their estimated life expectancy. We are able to conclude that Life Equity LLC can assume to pay an additional 2.634 years, or 31.603 months, of premium payments when an insured's primary impairment is cancer. Based on the histogram shown above, there is a negatively skewed distribution. The standard deviation of 2.856 indicates that the values in the dataset tend to focus around the mean.

Cancer: Group C

Cancer: Group C
Normal

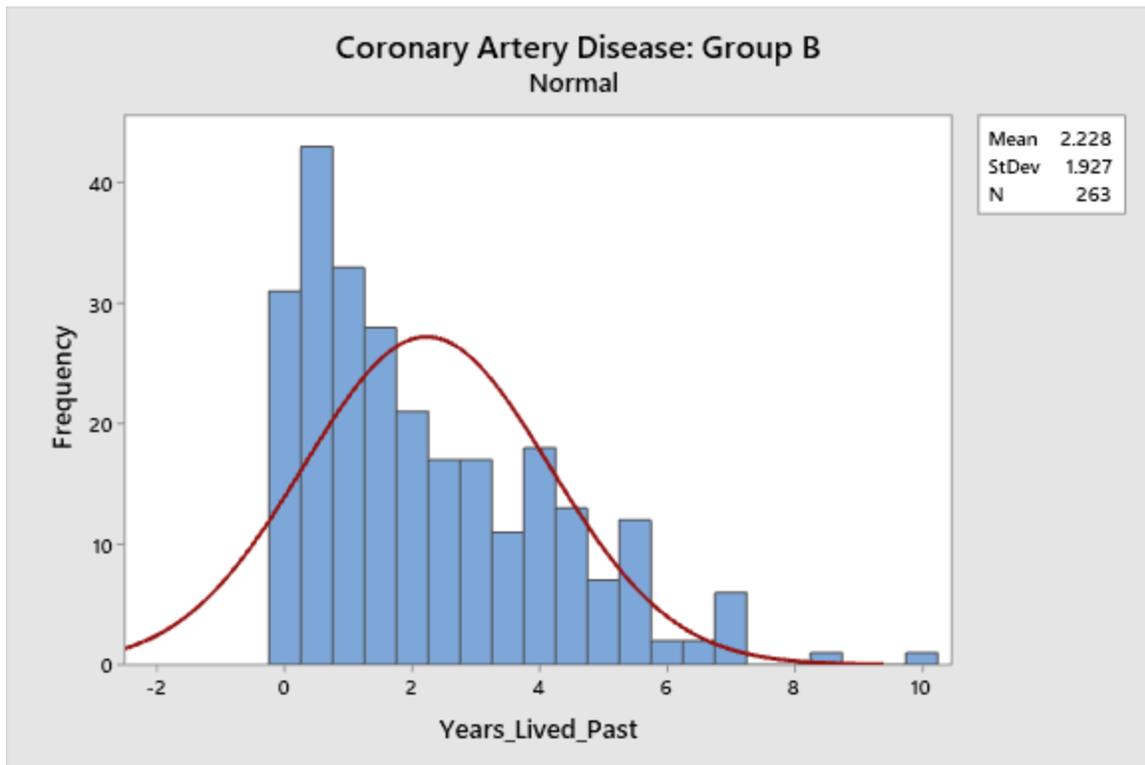|	
Mean	0.2558
StDev	3.837
N	313
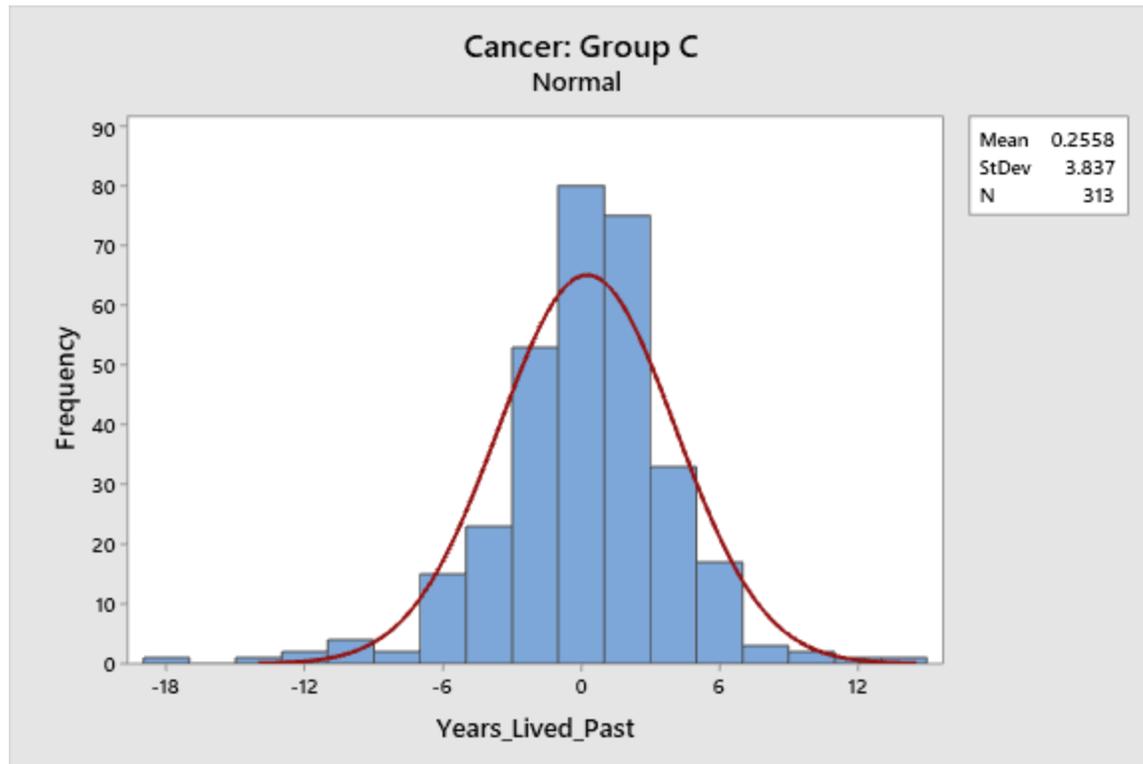
When combining both groups together, the average years is 0.2558 which indicates that an insured with cancer tends to live 0.2558 years in addition to their estimated life expectancy. We are able to conclude that Life Equity LLC can assume to pay an additional 0.2558 years, or 3.069 months, of premium payments when an insured's primary impairment is cancer. Based on the histogram shown above, there is an approximately normal distribution. The standard deviation of 3.837 is higher than when we separate the two groups, however it still indicates that the values in the dataset tend to focus around the mean.
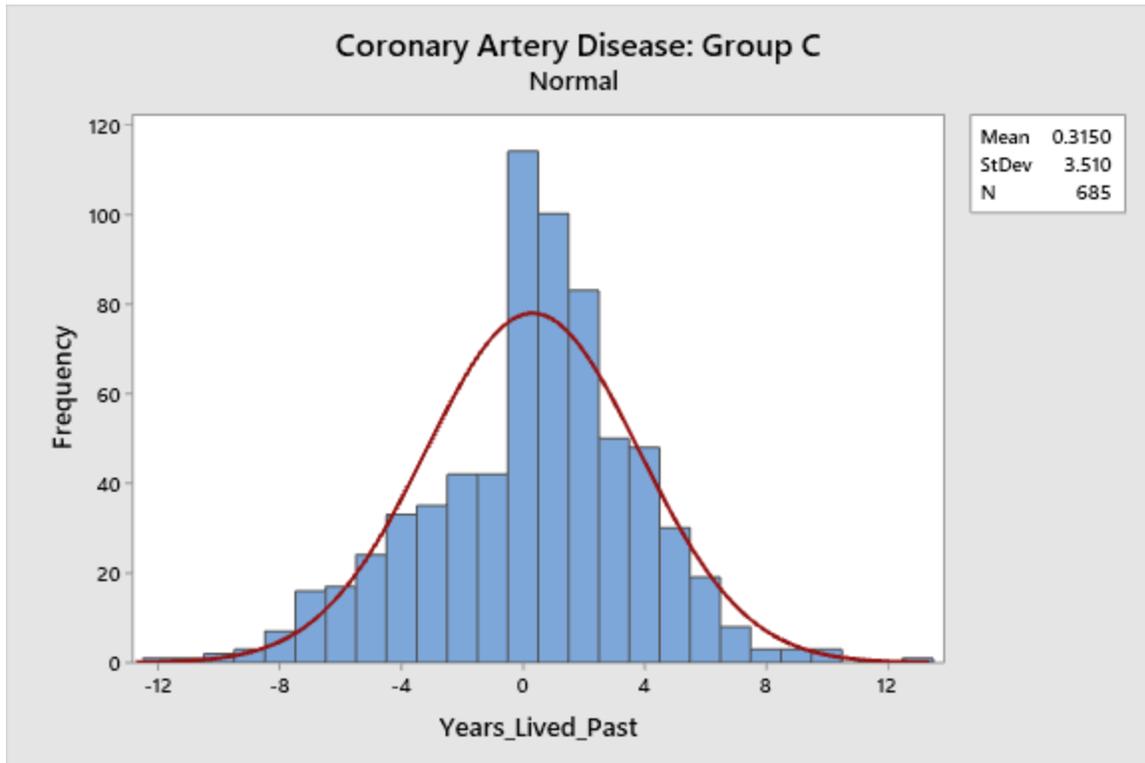
Coronary Artery Disease: Group A
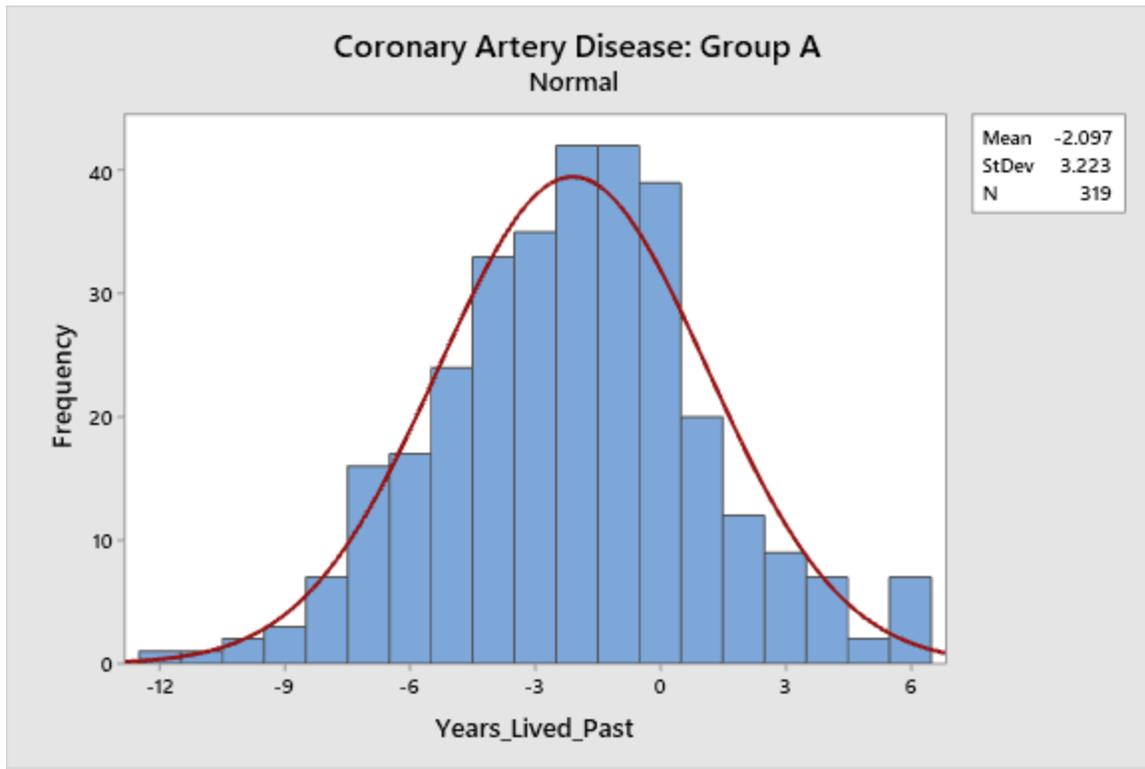
The average years is -2.097 which indicates that an insured, who actually died, with coronary artery disease tends to die 2.097 years earlier than what is estimated on their life expectancy report. We are able to conclude that Life Equity LLC can assume to save 2.097 years, or 25.162 months, of premium payments when an insured's primary impairment is coronary artery disease. Based on the histogram shown above, there is an approximately normal distribution. The standard deviation of 3.223 indicates that the values in the dataset tend to focus around the mean.
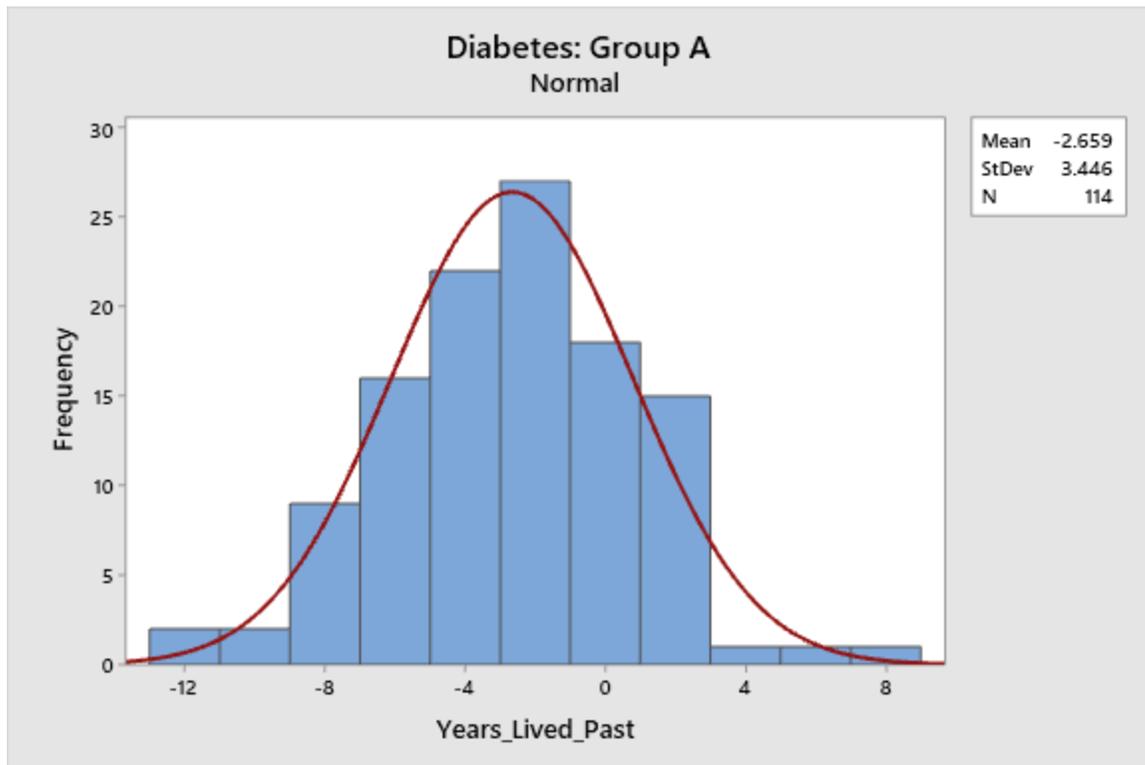
Coronary Artery Disease: Group B

The average years is 2.228 which indicates that an insured, who we assumed passed away on October 11, 2019, with coronary artery disease tends to live 2.228 years in addition to their estimated life expectancy. We are able to conclude that Life Equity LLC can assume to pay an additional 2.228 years, or 26.733 months, of premium payments when an insured's primary impairment is coronary artery disease. Based on the histogram shown above, there is a positively skewed distribution. The standard deviation of 1.927 indicates that the values in the dataset tend to focus around the mean.
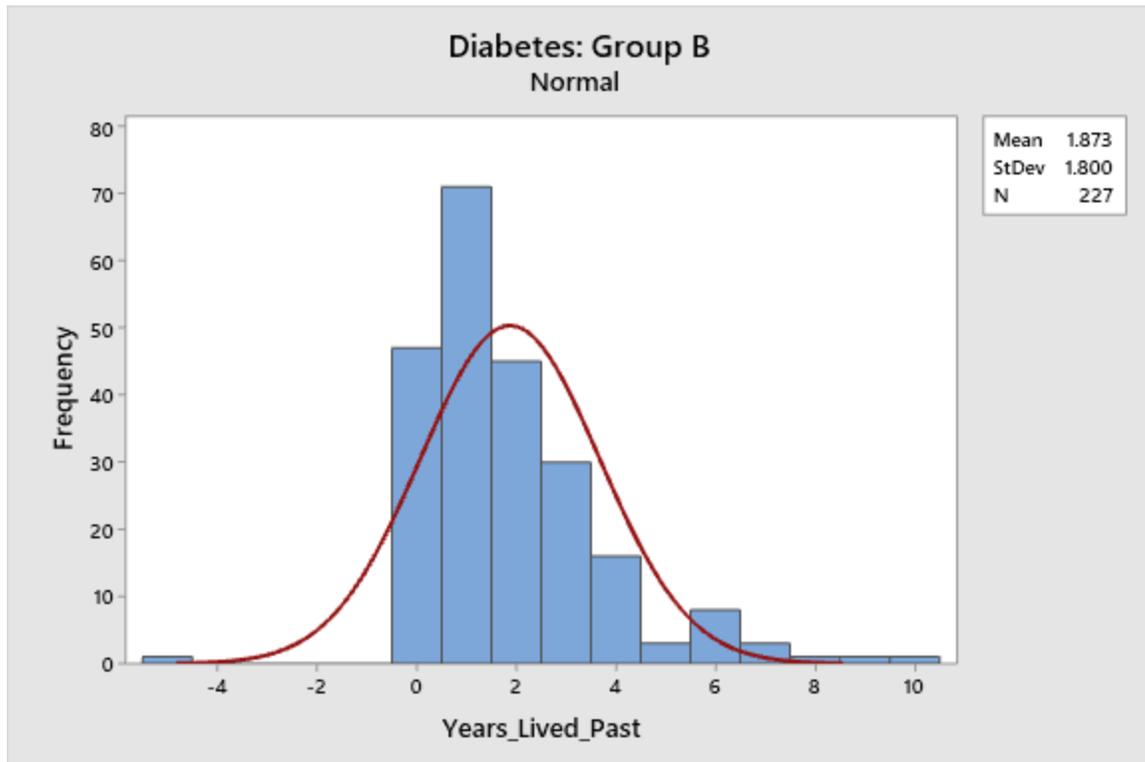
Coronary Artery Disease: Group C

When combining both groups together, the average years is 0.3150 which indicates that an insured with coronary artery disease tends to live 0.3150 years in addition to their estimated life expectancy. We are able to conclude that Life Equity LLC can assume to pay an additional 0.3150 years, or 3.0780 months, of premium payments when an insured's primary impairment is coronary artery disease. Based on the histogram shown above, there is an approximately normal distribution. The standard deviation of 3.510 is higher than when we separate the two groups, however it still indicates that the values in the dataset tend to focus around the mean.
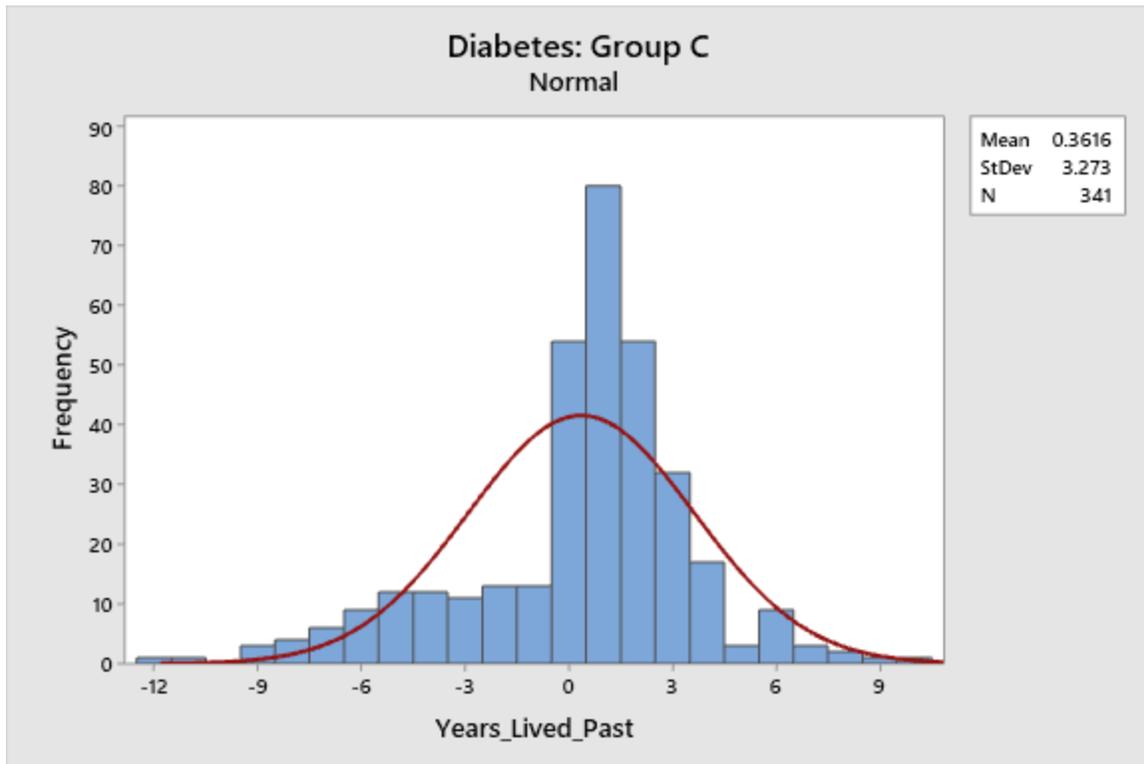
Diabetes: Group A

The average years is -2.659 which indicates that an insured, who actually died, with diabetes tends to die 2.659 years earlier than what is estimated on their life expectancy report. We are able to conclude that Life Equity LLC can assume to save 2.659 years, or 31.903 months, of premium payments when an insured's primary impairment is diabetes. Based on the histogram shown above, there is an approximately normal distribution. The standard deviation of 3.446 indicates that the values in the dataset tend to focus around the mean.
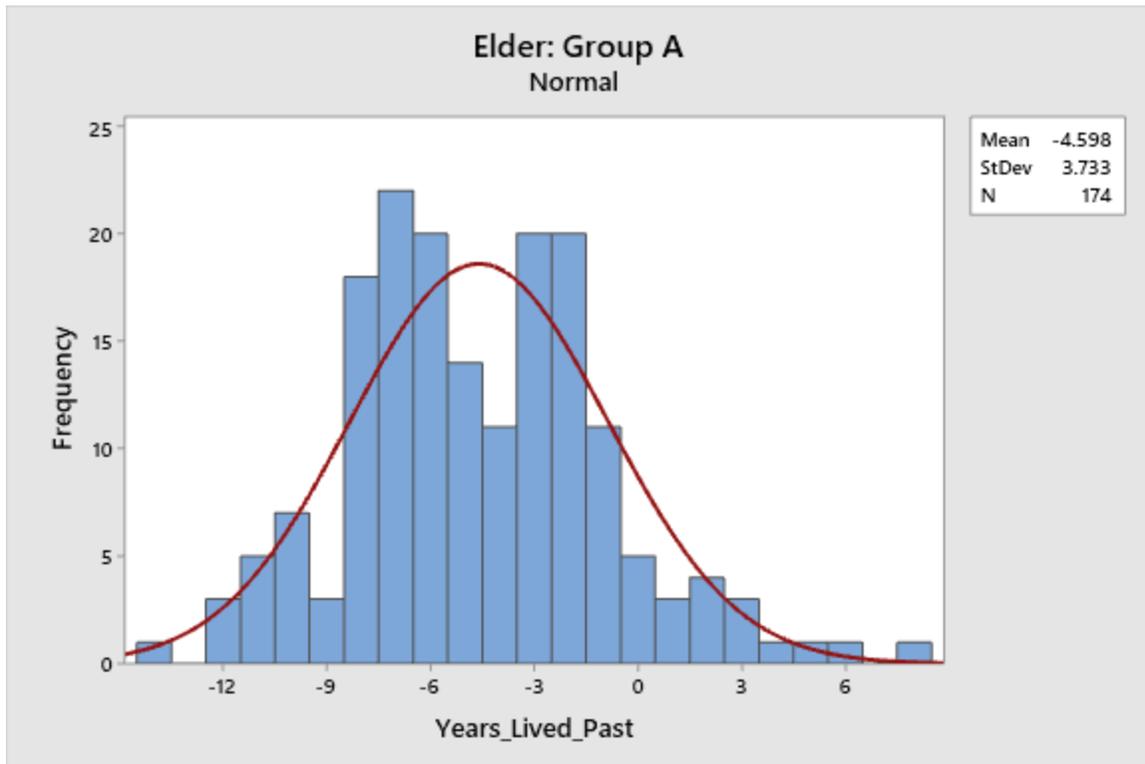
Diabetes: Group B

The average years is 1.873 which indicates that an insured, who we assumed passed away on October 11, 2019, with diabetes tends to live 1.873 years in addition to their estimated life expectancy. We are able to conclude that Life Equity LLC can assume to pay an additional 1.873 years, or 22.478 months, of premium payments when an insured's primary impairment is diabetes. Based on the histogram shown above, there is an approximately normal distribution. The standard deviation of 1.800 indicates that the values in the dataset tend to focus around the mean.
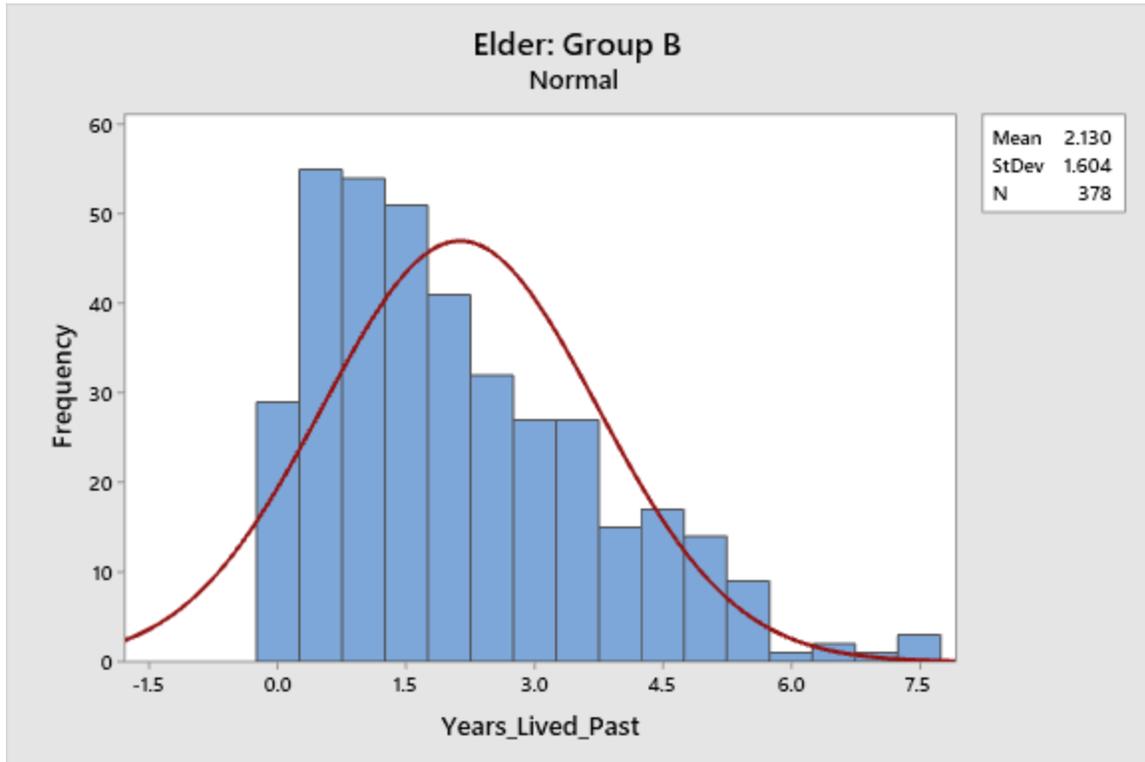
Diabetes: Group C

When combining both groups together, the average years is 0.3616 which indicates that an insured with diabetes tends to live 0.3616 years in addition to their estimated life expectancy. We are able to conclude that Life Equity LLC can assume to pay an additional 0.3616 years, or 4.339 months, of premium payments when an insured's primary impairment is diabetes. Based on the histogram shown above, there is a negatively skewed distribution. The standard deviation of 3.273 is higher than the group whose insured's date of death we assume to be October 11, 2019 but lower than the group whose insureds actually are deceased; however, it still indicates that the values in the dataset tend to focus around the mean.

Elder: Group A

The average years is -4.598 which indicates that an insured, who actually died, whose primary impairment is elder tends to die 4.598 years earlier than what is estimated on their life expectancy report. We are able to conclude that Life Equity LLC can assume to save 4.598 years, or 55.171 months, of premium payments when an insured's primary impairment is elder. Based on the histogram shown above, there is an approximately normal distribution. The standard deviation of 3.733 indicates that the values in the dataset tend to focus around the mean.

Elder: Group B

The average years is 2.130 which indicates that an insured, who we assumed passed away on October 11, 2019, with a primary impairment of elder tends to live 2.130 years in addition to their estimated life expectancy. We are able to conclude that Life Equity LLC can assume to pay an additional 2.130 years, or 25.562 months, of premium payments when an insured's primary impairment is elder. Based on the histogram shown above, there is a positively skewed distribution. The standard deviation of 1.604 indicates that the values in the dataset tend to focus around the mean.

Elder: Group C
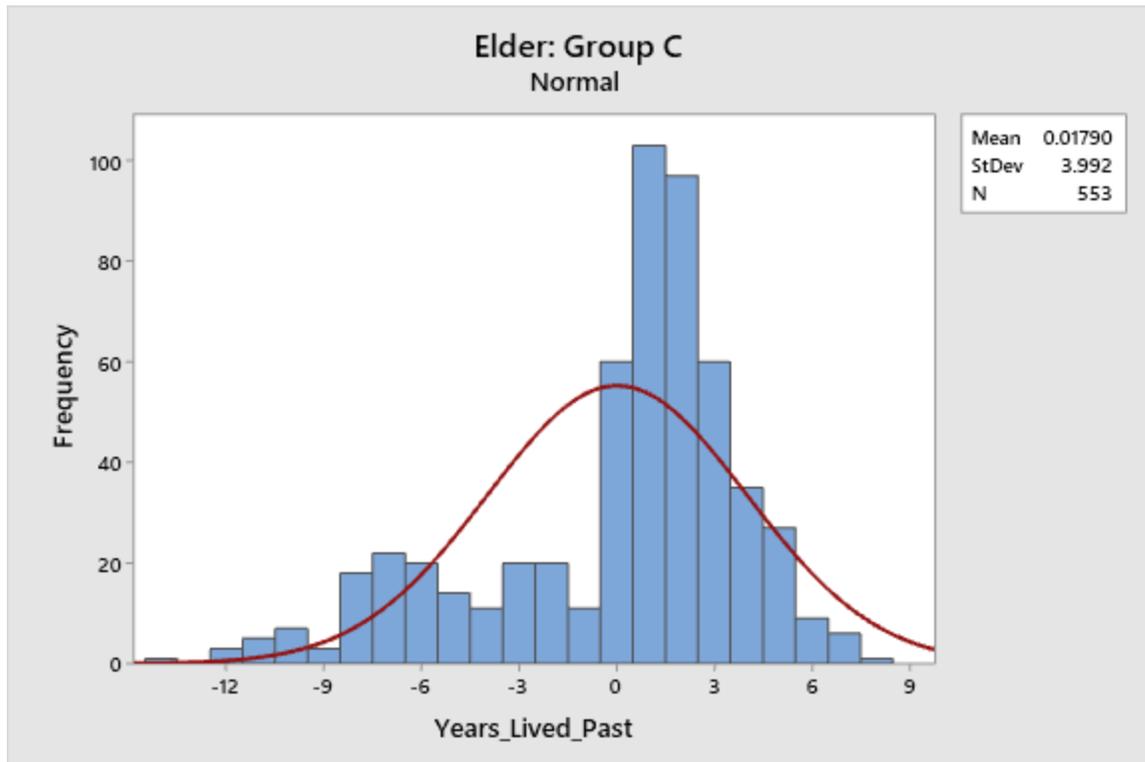
When combining both groups together, the average years is 0.0179 which indicates that an insured whose primary impairment is elder tends to live 0.0179 years in addition to their estimated life expectancy. We are able to conclude that Life Equity LLC can assume to pay an additional 0.0179 years, or 0.215 months, of premium payments when an insured's primary impairment is elder. Based on the histogram shown above, there is a negatively skewed distribution. The standard deviation of 3.992 is higher than when we separate the two groups, however it still indicates that the values in the dataset tend to focus around the mean.

Conclusion

Based on the information above, I am able to conclude that AVS Underwriting, LLC has accurate life expectancy reports based on the date of death of an insured in comparison to the expected date of death for the primary impairments: Cancer, Coronary Artery Disease, Diabetes, and Elder. From my calculations, we can see that Life Equity LLC has to pay an average of three extra months in premium payments when an insured's primary impairment is Cancer or Coronary Artery Disease. They are able to include the excess when doing pricing calculations in order to accommodate for the extra three months of premium payments. For the primary impairment of Diabetes, Life Equity LLC can expect to pay an additional four months of premium payments. Finally, if an insured's primary impairment is Elder, Life Equity LLC can expect to pay premiums up to the estimated date of death of the insured based on the life expectancy report.

Based on the results, we can see that AVS Underwriting, LLC is accurate in predicting an insured's life expectancy when the primary impairment is either Cancer, Coronary Artery Disease, Diabetes, and Elder. We can even say AVS Underwriting, LLC seems to underestimate the life expectancy of an insured based on their primary impairment. Additionally, Life Equity LLC is benefiting from ordering a majority of their life expectancy reports from AVS Underwriting, LLC. My recommendation for Life Equity LLC is to order AVS life expectancy reports if the primary impairment of an insured is, or related, to the primary impairments mentioned above.

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