

Predictive Resources October 2024 Communication

Clients and Friends,

Being respectful of your time, we do not inundate your inbox with a drumbeat of constant announcements, many of which would be nothing more than an attempt to keep our name in front of you. However, when we have something important to say, we say it. And, we currently have several important things to discuss. We believe that we are breaking new ground in the Life Expectancy space in terms of innovation, accuracy, and transparency.

It was announced earlier this year, but worth repeating, our immense pleasure in promoting Roger Tafoya to president and chief underwriting officer. Roger's expertise in life settlements, automated underwriting, electronic health records and digital health data makes us the envy of our competitors for having him on board. Our clients will continue to benefit from his expertise as they have for the past five plus years that he has been with us.

The New Predictive LE Certificate

I am most excited about the enhancements to our LE Certificate Roger developed with Greg Heck, our CIO, and Ryan Nelsestuen, our CTO. Allow me a slight digression, please, as it illustrates what makes Predictive Resources unique. We developed a new tool by harnessing the power of AI to produce a medical summary for each case. We believed it to be unique in the marketplace. We called it the Predictive LE Plus and added it to all cases at no charge. We were confident that clients would find the information in the Predictive LE Plus extremely valuable. Some of you noticed it. Many of you did not.

Client feedback is vitally important to us, so we reached out for further discussions. You told us that the LE Plus was not a big enough plus. You wanted more details about the longevity risk components and how they affected the LE. You also wanted more relevant information from the medical records and color on our thought process. I am pleased to announce – we listened. We tore up the LE Plus and started anew.

The result was a brand-new LE certificate, unlike any other. We select the relevant medical information, unlike some competitors who provide information inconsequential to the subject's longevity. But we have regrouped this information and added quantitative details. At a glance, you can see the primary conditions that drive the LE, the secondary conditions that are also relevant and the beneficial conditions that extend a person's LE. But there's more! We also tell you the percentage impact of all categories of impairments on the LE and those of each primary condition and all beneficial categories.

We also added detailed underwriter notes and, in the case of clinical reviews, clinician notes. Existing certificate notes remain but we will strive to better identify trends that could impact the LE. Thanks to our partnership with you, our clients, we produced a better product. But we also know that there could be other improvements. We encourage you to examine the new certificate in detail and tell us what else we can do to make it more useful to you. Because that is what we strive to be. [Here](#) is where you can find a more detailed explanation.

Death Tracking Service

Ever since the US Social Security database was purged a number of years ago, we have been skeptical of third-party services that purport to find deaths. Our concerns grew and reached their peak last year. In response to substandard tracking services, we developed a proprietary process and successfully found over 20% more deaths in our database than did the other available services. We are pleased to offer this service to you at attractive prices.

LE Providers – Industry Issues

It's been a strange time to be an LE provider. We have recently seen many new entrants to the space, and with them, unfortunately, the recurrence of outdated and widely disproven methods for calculating mortality. These new providers use these flawed ideas to justify shorter life expectancies, attracting business from transaction-oriented companies that buy and sell policies quickly, with no long-term reliance on the accuracy of the LE.

Use of Improper Mortality Tables

Valuation Basic Tables – There was a time when life settlement professionals thought that life insurance mortality tables like the Valuation Basic Tables (“VBT”) were appropriate for use in predicting life expectancies in the life settlements market. After all, insured lives comprise both groups. This notion was disproven in landmark research [we conducted almost 15 years ago](#). Rather than regurgitate our findings here, I will simply point out that if we substituted the 2015 VBT for our proprietary mortality tables in the LEs we produce, we find that the LEs become more aggressive and the A/E ratio falls by about 20%.

General Population Tables – At no time since the inception of the life settlements market has it been thought appropriate to use general population tables in determining life expectancies for the life settlement market. This is underscored by another paper [we wrote in 2014](#). Surprisingly, however, in the last 5 years, a life expectancy provider has actually begun using the general population tables in its LE predictions. Not surprisingly, this LE provider has been popular because of the resulting short LEs, which have been shown to be inaccurate by two independent analyses.

It is important to note that two separate studies of this LE provider's results – one by a competitor and one by independent actuarial experts - came to the identical conclusion that their LEs were short and their A/E abysmal. This purveyor of short LEs defended their work by utilizing improper logic and incomplete analyses. We are happy to discuss further and in more detail if contacted.

Improper characterization of LEs

Referencing LEs as point estimates. LEs are not point estimates – they are probability distributions, and suggesting the point-in-time-estimate is a legitimate basis for analysis takes us back to the dark ages of life expectancy underwriting. Back then folks thought that an LE of 20 months meant the insured was going to die in 20 months. We know better – that the LE represents the mean expectation of death, but in reality, the insured could die tomorrow or live well beyond the mean LE.

This means when an LE provider suggests that theirs are more accurate because observed deaths are closer to the point estimate LE, you are correct to reject this assertion. They are only looking at deaths and ignoring those

still alive, which is incomplete. The accuracy of an LE provider can only be seen if all underwritings are analyzed, not just maturities.

A/E – Industry Issues

Let me first provide some relevant background information about Actuarial Standards of Practice (ASOPs). The American Academy of Actuaries (AAA), “a 20,000 member... ..professional association whose mission is to serve the public and the U.S. actuarial profession”, promulgates the ASOPs. “The Academy assists public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. **The Academy also sets qualification, practice, and professionalism standards** for actuaries credentialed by one or more of the five U.S.-based actuarial organizations in the United States.” (from the AAA website, emphasis is mine)

The AAA created an Actuarial Standards Board to administer ASOPs. In their words, “ASOPs describe the procedures an actuary should follow when performing actuarial services and identify what the actuary should disclose when communicating the results of those services.” Specifically, ASOP #48 deals directly with Life Settlements.

We have seen multiple LE providers disclosing their A/E results, which should be a good thing. **However, we feel a number of these disclosures do not comply with ASOP #48, which was put in place to ensure consistency and transparency in evaluating life settlement mortality (which includes performing A/E studies for the Life Settlement Industry).** When we discuss our A/E results below, it is our goal to provide a more complete and accurate assessment than what we have recently seen in the market. As required, we disclose that our A/E results are not a guarantee of future results. Here are some of the issues with our competitors’ practices:

Subsetting – Leaving out important parts of the data. An LE provider that has been in business for many years provides an A/E study based on only their most recent data. To be clear, subsetting is not addressed in ASOP #48, however, another ASOP specifically requires disclosure if such omissions could materially impact the result of the analysis. We can assert with confidence that leaving off huge portions of an LE provider’s history will distort any A/E analysis under most reasonable circumstances.

Small Sample Sizes – Many new entrants have no or little data upon which to base their A/E studies. In this case, confidence intervals should be provided to let you know if the results provided are statistically significant. There is another ASOP that specifies disclosures required when data are sparse and, as such, are less reliable and predictive.

Substitution Of A Different Mortality Table – Even though ASOP #48 subsequently provided for both historical-based and current assumption-based A/E analysis, one LE provider insisted that the historical basis, which he defined as using, “the actual LEs provided to clients at the time of underwriting,” was the only acceptable and accurate way to measure LE provider performance. What he didn’t say is that he used those LEs, but altered them by substituting a different mortality table and using a process known as backsolving to lower expected deaths in early durations and pump up his A/E. This practice is not consistent with the definition of historical basis in ASOP #48, which states that historical basis utilizes both the historical underwriting AND the historical mortality tables.

Unfortunately, his company did the same thing in their most recent A/E disclosure. For example, substituting their mortality table from 2018 to alter LEs from 2010 and presumably improve their A/E. When questioned about this

practice, he said that his company's 2018 table did not differ materially from their 2010 table. This flies in the face of virtually every mortality table published in that time frame, including our own mortality tables, which showed significant improvement from our initial 2013 mortality tables to those we currently employ.

Incomplete Analyses – **Providing a single figure for overall LE is not indicative of an LE provider's accuracy.** For example, if half of their underwritings had an LE of 50% and the other half 150%, you wouldn't want to use that LE provider. However, they could state that their A/E was 100% – perfect! To properly assess LE provider performance, ASOP #48 specifies more breakdowns are needed (e.g. by gender, age bands, smoking status, multiplier, primary impairment or combinations thereof). Durational analysis is also helpful, although it is a difficult exercise to compute. We have found that there is general disagreement among actuaries with respect to the methods to compute durational analysis and that this data often lacks statistical credibility beyond the early durations. For those reasons, we do not prepare or disclose durational calculations.

Point Estimate Misuse – This arises out of misunderstanding of the nature of an LE. As we discussed above, the LE is a probability distribution of death beginning when it is issued and stretching out as far into the future as there is a chance the subject could possibly be alive. As we all know (but sometimes don't like to admit), a person could die tomorrow, or live to a ripe, old age. The probability distribution encompasses that entire spectrum. The LE, often expressed in months, is the average or median lifetime left – it's shorthand for that whole distribution. It may be helpful to look at the situation a different way. Take two six-sided dice – what is the average roll? It's seven. But there is a small chance of rolling a 2 and an equally small chance of rolling a 12. An LE is not a point estimate, period. **Any analysis referencing a point estimate, i.e. a single number, as an appropriate comparison for LE accuracy is improper and may be misleading.**

Predictive Resources' A/E

Since I have given numerous examples on what not to do with respect to A/E disclosure, let me provide what I consider a more appropriate and transparent view. Even though space is limited, the following will provide many insights beyond our very excellent overall A/E. Here are a few things to keep in mind:

1. We include every LE that we ever produced for the life settlement industry using our proprietary process, mortality tables and full underwriting except for a few that were hand calculated on a spreadsheet early on as our system was being built. LEs produced for use in our expert witness work outside of life settlements, illustrative LEs in the Life Partners bankruptcy case where there was no underwriting, accelerated longevity estimates where we had no medical records, and special requests (not issued LE certificates) where the client specified certain assumptions are also excluded.
2. We present the A/E on what ASOP #48 calls **historical basis** and a **modified basis** which we call current methodology.
 - a. **Historical basis uses the actual LEs sent to clients - the mortality curves that resulted when we applied the methods, the mortality tables, and the underwriting manual that was in effect when the LE was first issued.** The historical basis results will be shown for both clinical and non-clinical cases.
 - b. **Current methodology uses the mortality curves that would have resulted on the day the LE was issued if we had used our current methods, mortality tables and underwriting manual.**

Historical basis is the strictest test of accuracy as it uses **all** the information in the LE that was created on the day it was issued. It reflects how we did. The current methodology basis is also useful in that it captures modifications that were made as our data accumulated, and represents the total of our efforts to adjust, based on the observed data over time. It is a better representation of how we are likely to perform going forward.

The current methodology A/E will be shown for **non-clinical** cases only. It would take significant time and resources to reapply our clinical methodology to all our **clinical** cases, and the historical basis is more conservative when assessing LE provider performance.

3. Our calculations have been validated by two independent actuaries whose calculations resulted in slightly higher A/Es; our calculations are essentially the same, but slightly more conservative than theirs.
4. **We do not include any incurred but not reported (IBNR)** deaths in our analysis. It's not that we don't believe in the concept, it's that there are many different opinions as to its proper use. We believe that about 4% of the deaths are unreported, given our methodology. Feel free to adjust the figures as you wish. Using zero IBNR is more conservative as it produces a lower A/E.

I mentioned our methodology. We allow approximately 3 months to pass before sweeping for deaths in our A/E analysis. For the analysis below, we use September 30, 2023 as a cutoff date for the cases underwritten, but swept for deaths on those cases at year end 2023, giving 3 months' time for the deaths to show up in the various systems we track.

5. **For each result, we produce a 95th percentile confidence interval** to provide additional information. As you might guess, the narrower the confidence interval, the better. As we get more data, the confidence intervals tighten up. The confidence interval is a statistical measure that helps us better interpret the results. The proper interpretation of our 95th percentile confidence interval is – given the calculated value based on the data used, there is a 95% chance that the actual number falls between the lower confidence bound and the higher bound. We will elaborate further using specific examples below.

A/E Results

Begin with standard (non-clinical) cases under our current methodology:

Non-Clinical	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
Current	3,094.00	3,106.37	99.60%	96.09%	103.12%

We are very pleased with this result. What it says is that we expected 3,106 deaths and found 3,094, resulting in an A/E of 99.60%. Given the amount of data involved, there is a 95% chance that our real A/E lies somewhere between 96.09% and 103.12%. **But should you trust this number? No!** It does **not** provide the detail you need to believe that this result applies to every LE we produce. You should ask us for more detail. And as a responsible LE Provider, we will oblige you.

Here is a breakdown by gender and smoking status:

Non-Clinical Current by Gender & Smoking Status						
Gender	Smoker	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
M	N	2,053.00	2,085.02	98.46%	94.17%	102.76%
M	T	142.00	139.96	101.46%	84.89%	118.03%
F	N	875.00	872.04	100.34%	93.70%	106.98%
F	T	33.00	22.50	146.67%	105.35%	188.00%

Things are getting more interesting. For the largest cohorts – male and female nonsmokers – the results are still excellent. Even male tobacco looks good. But did you notice the confidence interval for male smokers? Even though the observed A/E is 101%, there is far less data so the real number could be anywhere from 84% to 118%. And female tobacco is such a small group that their confidence interval is extremely wide. But there is more information you should request.

Here are gender and age breakdowns:

Non-Clinical Current by Gender & Age Bands						
Gender	Ages	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
M	< 70	284.00	273.61	103.80%	91.95%	115.65%
M	70 - 80	741.42	742.58	99.84%	92.65%	107.04%
M	80 - 90	843.49	882.35	95.60%	89.00%	102.19%
M	90+	318.08	314.61	101.10%	90.05%	112.15%
F	< 70	50.50	43.89	115.06%	85.47%	144.64%
F	70 - 80	126.25	132.50	95.29%	78.26%	112.31%
F	80 - 90	395.95	397.22	99.68%	89.85%	109.52%
F	90+	334.30	319.62	104.59%	93.63%	115.55%

Now you can see more variability. Looking at the results, you may be tempted to conclude that we are conservative under age 70 and over age 90 for both genders. However, if you also consider the confidence intervals, you can see that they straddle 100%, which is a good result. While it's possible that we are conservative there, it is not statistically significant. If the lower confidence interval was over 100%, then the results would be statistically significant. So you have a decision to make on whether to act on the information or wait for more data. With our LEs, it is an informed decision thanks to us producing this additional breakdown. You may have data that supports these results and feel confident assuming our A/E at these ages can be relied upon. Let's look at one more breakdown for non-clinicals.

Here are gender and mortality multiplier (MM) breakdowns:

Non-Clinical Current by Gender & Mortality Multiplier Bands						
Gender	Multipliers	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
M	< 1.50	173.33	192.10	90.23%	76.09%	104.37%
M	1.50 - 4.50	912.81	888.05	102.79%	96.21%	109.37%
M	4.50 - 7.50	446.48	422.66	105.64%	96.10%	115.17%
M	7.50+	654.38	710.34	92.12%	84.77%	99.48%
F	< 1.50	65.48	69.63	94.04%	70.55%	117.53%
F	1.50 - 4.50	400.06	373.68	107.06%	96.92%	117.20%
F	4.50 - 7.50	149.14	138.04	108.03%	91.35%	124.72%
F	7.50+	292.32	311.87	93.73%	82.63%	104.83%

Although all confidence intervals except males with MM > 7.50 straddle 100% and results are excellent for mortality multipliers from 1.50 – 7.50, the upper confidence intervals at the lowest and highest MMs are very close to 100.00%, suggesting that we are leaning aggressive (short) for those cohorts. We are doing more statistical analyses to validate this data.

Moving on to **historical basis; LEs based on the mortality tables, underwriting debits and methods used when the LEs were issued** yields the following:

Non-Clinical Historical	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
	3,113.00	3,403.22	91.47%	88.11%	94.83%

All things considered, we find these results to be quite good. As most of you would expect, over our entire history, we were slightly aggressive, but keep in mind that IBNR is not included. Even a small IBNR would put these results very close to 100.00%.

Here are additional breakdowns for historical basis:

Non-Clinical Historical by Gender & Smoking Status						
Gender	Smoker	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
M	N	2,066.00	2,213.04	93.36%	89.19%	97.52%
M	T	144.00	154.06	93.47%	77.68%	109.26%
F	N	879.00	1,016.93	86.44%	80.29%	92.58%
F	T	33.00	32.74	100.79%	66.54%	135.04%

Non-Clinical Historical by Gender & Age Bands						
Gender	Ages	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
M	< 70	291.50	210.69	138.35%	124.85%	151.86%
M	70 - 80	741.92	676.46	109.68%	102.14%	117.21%
M	80 - 90	849.49	1,075.10	79.01%	73.04%	84.99%
M	90+	319.08	392.93	81.21%	71.32%	91.09%
F	< 70	50.50	35.22	143.40%	110.38%	176.43%
F	70 - 80	127.25	130.67	97.38%	80.23%	114.53%
F	80 - 90	397.95	483.81	82.25%	73.34%	91.16%
F	90+	335.30	398.33	84.18%	74.36%	94.00%

Non-Clinical Historical by Gender & Mortality Multiplier Bands						
Gender	Multipliers	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
M	< 1.50	101.25	125.93	80.40%	62.93%	97.87%
M	1.50 - 4.50	817.21	917.38	89.08%	82.61%	95.55%
M	4.50 - 7.50	481.09	459.18	104.77%	95.62%	113.92%
M	7.50+	802.45	852.69	94.11%	87.40%	100.82%
F	< 1.50	44.32	50.97	86.94%	59.49%	114.40%
F	1.50 - 4.50	371.02	441.25	84.08%	74.75%	93.41%
F	4.50 - 7.50	163.97	175.48	93.44%	78.64%	108.24%
F	7.50+	331.70	380.33	87.21%	77.16%	97.26%

One obvious difference between historical and current assumption analyses is seen at youngest and oldest ages. A few years ago, we surmised that we were too conservative at youngest ages and too aggressive at oldest ages. Led by data analytics, we undertook painstaking analysis that validated our impressions. We then tested and then implemented the indicated changes. As you can see from comparing the current assumption and historical basis charts above, these changes produced more accurate LEs.

Ages 80-90 males is a strange situation where the data suggests we have been too aggressive. However, fixing this would violate what we consider to be an absolute truth – mortality increases directly with age. We choose to believe the absolute truth despite the data. Either life settlement folks behave differently at those ages or there is something else related to some of our other assumptions that we need to assess. We believe the latter.

Highest mortality multiples – here is another area we are actively studying because our A/E is below 100% under both bases. We have theorized that some of our table adjustments for, say anti-selection, should vary by mortality multiplier (i.e., the higher the multiplier, the higher the initial anti-selection). Whatever our conclusion, we will act on it timely.

Lastly, we present data for **clinical** reviews – those cases where we believe our normal underwriting process and mortality tables are not directly applicable. Overwhelmingly, these cases involve high grade cancers, although there are some other serious diseases represented, ALS, for example. Thanks to capabilities of our proprietary software, we can modify our current mortality curves to match the relevant research of our clinicians.

Clinical	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
Historical	983.00	1,153.29	85.23%	79.46%	91.01%

Given the intense research needed to develop a clinical review, we did not perform a current assumption basis for these cases. What is obvious is that advancements in medical research affect this category more than the others.

Clinical Historical by Gender & Age Bands						
Gender	Ages	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
M	< 70	276.50	369.53	74.82%	64.63%	85.02%
M	70 - 80	297.92	288.59	103.23%	91.70%	114.77%
M	80 - 90	137.58	160.21	85.87%	70.39%	101.36%
M	90+	34.00	35.25	96.44%	63.43%	129.45%
F	< 70	115.00	164.79	69.78%	54.52%	85.05%
F	70 - 80	59.00	61.92	95.28%	70.38%	120.19%
F	80 - 90	38.00	47.56	79.90%	51.48%	108.32%
F	90+	25.00	25.43	98.31%	59.44%	137.17%

Clinical Historical by Mortality Multiplier Bands					
Multipliers	Actual	Expected	A/E	Lower 95 CI	Upper 95 CI
< 5.00	189.25	175.96	107.55%	92.78%	122.33%
5.00 - 10.00	157.17	147.70	106.41%	90.28%	122.54%
10.00 - 15.00	89.25	92.11	96.90%	76.48%	117.32%
15.00 - 20.00	60.83	61.90	98.27%	73.36%	123.19%
20.00+	486.50	675.62	72.01%	64.47%	79.55%

What isn't so obvious is, other than the highest multipliers (above 20), our A/E is very good, 103.94% to be exact. The most serious cancers are usually ones most affected by medical advances. When I entered the life settlement market back around the turn of the century, multiple myeloma and most lymphomas were death sentences. No longer! It's difficult to know in advance what the effects of research on a given cancer will produce. But we cannot be satisfied with our A/E for these high multiple clinicals, and we will adjust to reflect what the data is telling us.

Industry Challenge

To conclude our A/E discussion, we are proud to provide you the most detailed and complete A/E analysis that I have ever seen published in our space. To our trusted clients, we can provide even more detail should you desire. To our competitors, we challenge you to provide this level of detail on your book. To be frank, industry-wide efforts to resolve this issue have resulted in lots of rhetoric and very little actual progress. We feel that the incomplete information has been published and the time to talk is over. **It's time to meet the professional actuarial standards for disclosing A/E.**

A/E and Me

We are able to calculate A/E reports for each of our clients as well, in support of their marketing efforts. What better way to convince your stakeholders of your expertise than to show them hard evidence of your portfolio, using the A/E of Predictive life expectancies? This Predictive LE report will include details about our calculations and methodology. We are happy to further discuss this with interested parties.