Cost-benefit analysis of underwriting screening for opioid risks

Introduction

In a recent survey conducted by Munich Re, over 90 percent of underwriters surveyed reported that they were concerned about the potential impact of opioid addiction on mortality for the life insurance population.[1] To help address these concerns, in mid-2017 insurance laboratories introduced expanded screening protocols for both prescription and illicit opiates in order to improve the risk selection process.

The question we hear from underwriters is: is it financially feasible to screen all life applicants for opioid use?

The intention of this paper is to provide context for these concerns by exploring various screening options, and to provide a cost-benefit analysis that can assist underwriting departments in determining when to use such screening tools.

Blood profile screenings

Recently, the insurance laboratories have started to offer expanded screening protocols for opioids. There is one screening protocol for the natural opioids — morphine, codeine and heroin. However, because the synthetic and semi-synthetic opioids have different chemical structures, additional screening protocols had to be developed to detect them. Additional screening is now available for methadone, hydrocodone, oxycodone and fentanyl.

With new screening options available, it is up to underwriting departments to determine how to incorporate them into their underwriting guidelines. From a financial perspective, it would only be beneficial to implement the new screening protocol for the ages and risk classes where expected savings from claims

costs exceed the cost of the test itself. The cost of the full opioid panel can vary; for purposes of this analysis we will use $12 per application as a reasonable approximation. Now that we have the cost, how do we calculate the expected claims savings?

As a starting point, we used CDC population mortality data[2] to estimate the implied claims savings under a best case scenario where the new underwriting protocol was 100 percent effective at identifying and declining risks associated with opioid overdose.[3] The following chart shows the expected savings over 10 policy years[4] for a $100,000[5] life insurance policy.

Expected savings (with 100% effective UW protocol)		
Age	Male	Female
25	$40.72	$29.55
35	$46.74	$27.01
45	$45.93	$29.66
55	$43.04	$27.71

Based on these results we might conclude that it is worthwhile to screen *all* applicants for opioids. However, this would be an overstatement of the benefit, as it has been shown that substance abuse mortality rates from life insurance populations are much lower than rates among the general population.[6]

Fully underwritten market

To calculate the impact of opioid screening on the insurance population, we used Munich Re's insured mortality experience[7], which included over 1,400 claims due to overdose, to estimate the claims savings in a best case scenario, where the new underwriting protocol

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was 100 percent effective at identifying and declining risks associated with opioid overdose in the first year. The following chart shows the expected savings over 10 policy years for a $100,000 life insurance policy.

Expected savings (with 100% effective UW protocol)		
Age	Male	Female
25	$6.83	$3.60
35	$4.54	$2.20
45	$4.07	$3.27
55	$4.25	$4.44

As can be seen, the expected savings is considerably lower than that of the example based on general population statistics and somewhat less than the cost of the drug screening itself. However, we should not immediately conclude that there are no uses for these screenings.

Smokers

Although there might not be a cost savings for including opioid screening across the entire portfolio, there are pockets where screening could be beneficial. If we look at this same data split by smoking status, we see a significant difference in the cost savings for smokers versus non-smokers. At most ages affected by the epidemic, the expected claims savings for smokers is higher than the cost of the screening protocol.

The following charts show the same scenario as before, only now we see the results on a smoker distinct basis. We see that the benefit gain by testing smokers is on average more than the cost of the underwriting protocol.

Male	Expected savings (with 100% effective UW protocol)		
Age	Aggregate	Non-Smoker	Smoker
25	$6.83	$6.66	$ 8.44
35	$4.54	$4.10	$12.35
45	$4.07	$3.15	$26.53
55	$4.25	$3.40	$28.33

Female	Expected savings (with 100% effective UW protocol)		
Age	Aggregate	Non-Smoker	Smoker
25	$3.60	$3.25	$ 8.30
35	$2.20	$1.50	$10.99
45	$3.27	$2.91	$13.93
55	$4.44	$3.93	$17.98

Based on these results, one option might be to implement a reflexive opioid screening on all applicants who have a positive cotinine test.

Middle Market

We have seen the significant difference in the set of results based on general population statistics compared to the set based on life insurance claims experience. Part of this difference is explained by the socio-economic makeup of the insured population. When we subdivide the general population into socio-economic strata (using education as a proxy, as discussed in our 2017 white paper, "Drug abuse in the insured population"), both mortality and cost savings decrease as you move up the socio-economic ladder.[6]

This can be seen in the following chart where the college-educated population is compared to the general population and to the insurance population. The college-educated subgroup of the general population exhibits mortality levels similar to, but not quite at the level of, the insured population in early policy durations (durations 1-15). The difference can partially be explained by the benefit that is being derived from traditional underwriting during the initial years of the policy.

Male	Expected savings (with 100% effective UW protocol)		
Age	General population	College educated	Insured
25	$40.72	$ 9.70	$6.83
35	$46.74	$10.43	$4.54
45	$45.93	$11.02	$4.07
55	$43.04	$11.15	$4.25

Female	Expected savings (with 100% effective UW protocol)		
Age	General population	College educated	Insured
25	$29.55	$3.83	$3.60
35	$27.01	$6.31	$2.20
45	$29.66	$8.75	$3.27
55	$27.71	$9.64	$4.44

Limitations

As the industry tries to capture the middle market and move away from fluid underwriting towards accelerated or automated underwriting processes. New target markets may exhibit a different mortality level due to both the socio-economic effect and the reduction in the selection benefit from the more streamlined underwriting process.

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Another consideration is that even if these screening protocols are 100 percent effective at determining if someone has used opioids recently, it does not automatically follow that the person is at risk of addiction or death. Thus the effectiveness of the implementation of the underwriting protocol will be less than 100 percent.

Prescription drug database checks

Another tool already at the underwriter's disposal is a prescription database check that includes rules and algorithms based on this data. Using these databases, underwriters are able to see opioid prescriptions recently filled for the applicant. The existence of a prescription for opioids is not in itself a reason to decline an applicant; underwriters would have to use their judgement to determine if such a prescription was legitimate or potentially being abused. Key items to consider are: overlapping prescriptions from multiple sources, high daily dosage, and history of mental illness or substance abuse.

When discussing the protective value of prescription databases for the risk associated with opioids, we must also consider where those who are at the highest risk of death get their drugs. In the 2015 National Survey on Drug Use and Health only 36 percent of participants reported obtaining opioids through their own prescriptions.[8] This is consistent with the growing trend away from prescription drugs toward cheaper, more easily accessible street drugs[9], and may indicate that those who are at most risk of excess mortality due to opioid use will not have recently-filled opioid prescriptions. Rather, they have already transitioned to illicit sources for the drugs. In such a case, traditional prescription drug databases will not flag this subpopulation with elevated risk of opioid abuse.

Conclusions

In assessing the benefit of opioid screening tools, it is not as simple as using population statistics to calculate cost savings. When insurance statistics are used in the analysis, the benefit is less clear. There are several risk factors that show evidence that implementation of screening would provide benefits. The most notable include:

- Using opioid screenings reflexively after a positive cotinine test.
- Implementing screening for non-traditional target markets such as the middle market.
- Implementing screening in the triage stages of streamlined underwriting programs (such as random holdouts).

Footnotes & references

1. https://www.munichre.com/us/life/news-and-media/news/2017/Nine-out-of-10/index.html

2. Mortality Multiple Cause-of-Death Public Use Record from the CDC

3. We assumed this effect wore off linearly over a 20-year period.

4. We illustrated the benefit for a ten year term product and we ignored the effect of persistency to simplify the illustration.

5. Although $100,000 is illustrated here, cost savings for different face amounts could be estimated from these results using proportions. However, as you move to higher face amount bands, medical evidence that is generally obtained will likely result in less additional benefit from the new screening protocol. Hence the marginal benefit diminishes.

6. Tim Morant, FSA, MAAA, FLMI. "Drug Abuse Mortality in the Insured Population." Munich Re white paper, 2017. https://www.munichre.com/site/marclife-mobile/get/documents_E-565929720/marclife/assset.marclife/Documents/Publications/drug-abuse-mortality-in-insured-population.pdf

7. This insured experience is from a time when opioid screening protocols were not available.

8. Gina Guzman, MD, DBIM, FLMI, FALU. "Opioid Epidemic – How did we get here?" Munich Re white paper, 2017. https://www.munichre.com/site/marclife-mobile/get/documents_E-1016841552/marclife/assset.marclife/Documents/Publications/Opioid_Epidemic_Origins.pdf

9. Gary Haddow, FLMI. "Heroin – the Other Opioid." Munich Re white paper, 2017. https://www.munichre.com/site/marclife-mobile/get/documents_E-1308082250/marclife/assset.marclife/Documents/Publications/heroin-the-other-opioid_WP_11-15-17.pdf

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NOT IF, BUT HOW