SIX PLANES DOWN: THE MAGNITUDE OF NICOTINE'S IMPACT ON MORTALITY

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The Boeing 737 is the world's best-selling large jet. It typically carries about 200 passengers. Imagine six 737s crashing every day; that's roughly equal to the number of Americans who die each day from tobacco-related causes.

Smoking is an issue that strikes close to home for me. I was born in Winston-Salem in North Carolina, so almost all of my childhood memories are infused with the distinctive smell of tobacco being harvested and cured. Like every other second-grader within 100 miles, one of my school outings was a tour of the R.J. Reynolds cigarette factory. But, if anything, that early exposure strengthened my opposition to smoking. In my current role as an actuary and consultant, I'm elbow-deep in mortality data, so I am constantly reminded that tobacco use is the leading cause of preventable disease, disability and death in the US.[1]

In 2014, the Surgeon General estimated that there were more than 16 million Americans living with at least one smoking-related disease.[1] The Centers for Disease Control and Prevention (CDC) has calculated that cigarette smoking contributes to over 480,000 deaths annually, as well as costing the US more than $240 billion in health care spending and almost $372 billion in lost productivity.[2] Even 60 years after the Surgeon General's Advisory Committee on Smoking and Health's first report, smoking is still a public health crisis and a topic of paramount interest to life insurers.

Executive Summary *The life insurance industry has long held that tobacco-using applicants have 200% mortality across the board. But that rule profoundly understates the risk, because smokers' comorbidities are far deadlier and their elevated mortality is surprisingly durable, even if they successfully quit. Meanwhile, legacy methods of identifying smokers (e.g., APSs) are less practical as simplified-issue products are more common, fully underwritten policies are often accelerated, and customers demand fast and fluidless purchasing experiences. Now that data-driven tools are available and more widely adopted, carriers can instantly and reliably find fact-based evidence of nicotine use in applicants—but they may need to think differently in applying that insight in their underwriting processes. This article surveys the latest smoking risk data and explains why tools that highlight nicotine use may be the single most effective way to limit slippage and enhance profitability.*

The rise of accelerated underwriting and simplified issue products means that fewer and fewer life insurance policies are the result of full medical underwriting. Given the limitations of self-disclosure and the fallibility of fluids tests—which have also fallen from favor—it's critical that carriers understand their options for effectively identifying nicotine use.

There are a number of ways to leverage individual medical information to find applicants who are likely to be smokers, including traditional attending physician statement (APSs) and electronic health records (EHRs). Both involve costs in time and money that are no longer compatible with some business models and consumer expectations. Instant and more affordable insurtech tools that automatically retrieve, review

and interpret medical billing and diagnostic codes are equally capable of returning fact-based evidence of tobacco history. At Milliman IntelliScript, in fact, we're seeing hard evidence of nicotine use in 16.4% of all combined Irix Prescription Data and Medical Data hits. And we've observed that more than 80% of this data is new information to carriers—it was not disclosed by applicants or found by their other risk assessment methodologies.

In a word: Tobacco, smoking and nicotine

Throughout this article, we generally refer to nicotine use or dependence rather than referencing a specific tobacco or smoking status. This is because many medical diagnosis and procedure codes indicate nicotine without specifying a means of delivery. We know through overlap analyses that these records most often correspond to smokers, but some percentage of reported nicotine use is accounted for by users of smokeless tobacco products or people using nicotine "vapes."

Where Else Can You Get Instant Identification of Sustained Double Mortality?

Ratio of Smoker vs. Non-Smoker Mortality
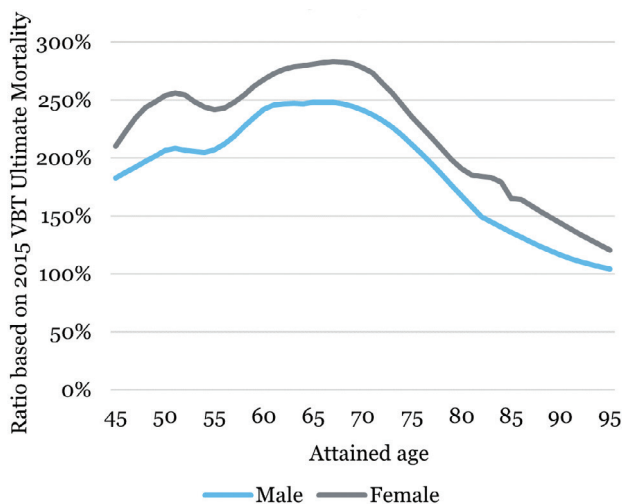
Source: This data drawn from the SOA's 2015 Valuation Basic Table Report illustrates smokers' elevated mortality, especially in the age bands of most interest to life insurers.

Conventional wisdom has long held that smokers have roughly twice the mortality of nonsmokers. As far as rules of thumb go, that's reasonable; although, depending on their age and whether they're male or female, smokers' mortality ranges from around 150% for younger smokers to nearly 300%. As a consumer reporting agency subject to the Fair Credit Reporting Act, Milliman IntelliScript's tools consider up to 7 years of an applicant's prior history. What we see

in our proprietary data broadly mirrors published research—as seen in the Society of Actuaries (SOA) Valuation Basic Table, for example—proving that double (or greater) mortality is sustained for a long time.

We all know that smoking greatly increases the risk of developing lung cancer; it's responsible for 80-90% of all lung cancer deaths.[3] But that's just the beginning. Smoking increases the risk for cancer in other organs throughout the body, notably the bladder, mouth, esophagus, liver and pancreas; it even increases the risk for blood cancer (e.g., acute myeloid leukemia). Non-cancer harms include increased risk and/or severity of chronic obstructive pulmonary disease (COPD), cardiovascular disease, coronary heart disease, stroke and diabetes with its attending complications, such as kidney disease.[4] Nicotine packs a real double whammy: it not only increases the likelihood of developing many chronic conditions—ranging from asthma to rheumatoid arthritis[5]— it also significantly elevates the mortality associated with those conditions.

Risk of Relapse
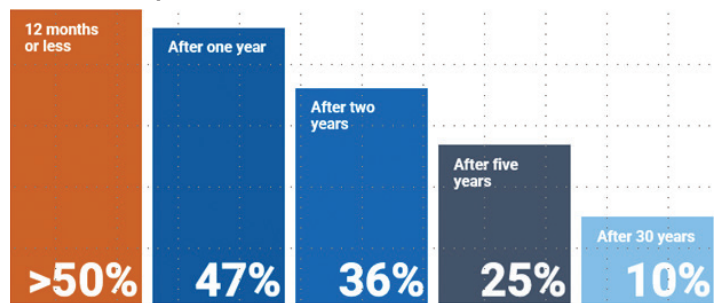
High relapse rates should concern insurers underwriting "ex-smokers".

Nicotine is a readily available and remarkably addictive substance, resulting in high rates of relapse after quitting attempts. In 2015, a CDC survey[6] found that nearly 70% of adults who smoked cigarettes were interested in quitting; a majority of respondents had tried to quit in the previous year, but only 7% of smokers had managed to stay off cigarettes for 6 months.

The American Cancer Society once estimated that people who successfully kicked their habit had tried and relapsed anywhere from 8 to 10 times.[7] A 2013 study published in the *Journal of Drug and Alcohol Dependence*[8] estimated that the risk of relapse for smokers was greater than 50% in the first year. Smokers who succeed in quitting for a full year have a slightly less than 50% chance of relapse, but relapse rates remain significant for several years.

"Giving up smoking is the easiest thing in the world. I know because I've done it thousands of times."— Mark Twain

While many health benefits of quitting begin to accrue almost immediately, cancer risks remain elevated, and the damage to some organs is persistent. It takes 10 to 15 years for the additional risk of lung cancer to drop by 50%; an ex-smoker has to stay quit for 15 years before the risk of heart disease drops to match that of someone who never smoked.[9]

Those high rates of relapse and long-lasting adverse health impacts are reason enough to question the common practice of treating insurance applicants with no evidence of smoking in the previous 1, 2 or 3 years as if their mortality was the same as that of people who have never smoked. If anything, our research has convinced us that any evidence of nicotine use, even years prior to an application, should flag increased mortality risk.

Thus, it's not a surprise that unidentified smokers are a significant cause of mortality slippage in accelerated underwriting programs. What are carriers to do in an era when consumers are accustomed to seamless, one-click purchase experiences? EHRs or APSs are likely to note a history of nicotine use where present, but those tools add substantial time and cost to the underwriting process.

Relying on applicant self-disclosure obviously leaves insurers open to misrepresentation. Applicants' answers can be confirmed with a lab test for cotinine—a nicotine metabolite that may be found in a smoker's blood, urine or saliva—but consumers may consider fluid tests invasive. Even if they're tolerated by applicants, tests add cost and negate efforts to accelerate underwriting. Cotinine tests are also fallible; some smokers can stay off nicotine long enough for their cotinine levels to drop below testing thresholds; others can easily find advice on YouTube or Google that will help them avoid being caught by saliva or urine tests.

SaaS Tools Can Use Medical Billing and Diagnostic Code Data To Instantly and Affordably Identify Nicotine Dependence

Insurtech software as a service (SaaS) tools supported by appropriate data networks can instantly identify nicotine use in over 16% of applicants by automatically retrieving, reviewing and interpreting up to 7 years of medical billing and diagnostic codes. The time period is limited by Fair Credit Reporting Act (FCRA) rules. A history of nicotine use may also show up in prescription fills for cessation products

Interpreted Clinical Data Reveals Nicotine Users in Three Key Categories.

Active use
Medical Data codes indicating continued nicotine use or dependence

Cessation treatment
Prescription Data or Medical Data detailing efforts to treat nicotine dependence

Personal history
Medical Data documenting disclosure of previous nicotine use to medical provider

Three categories of billing and diagnostic codes flag tobacco use: Active use codes are entered by a physician to indicate that a patient is currently a tobacco user; cessation treatment codes are entered when physicians counsel patients about quitting; and finally, there are diagnostic codes entered when patients tell a physician of a history of tobacco use.

such as Chantix, Zyban or various nicotine patches, gum or lozenges.

Nicotine use is only one of hundreds of medical conditions flagged by tools such as Irix Medical Data. However, given the prevalence of smoking and the severity of a "miss," whether by applicant nondisclosure or for other reasons, the identification of nicotine use is certainly one of the most important ways that such tools deliver value. The share of smoker applicants varies from 5% to 40% depending on the state, carrier and type of policy. In most programs, smoker nondisclosure is a real issue; as previously noted, we've found that about 80% of the time, a history of nicotine use flagged in Medical Data was not found any other way.

Ensuring Guidelines Are Met and, Possibly, Calling Guidelines Into Question

Life insurers have had lots of practice sizing up nicotine-using applicants. Over that time, the percentage of Americans who smoke has fallen, but the number of applicants using nicotine is still large. The magnitude of nicotine's impact on mortality, its compound effect on comorbidities, the herculean challenge of quitting, and the stubborn persistence of elevated mortality—long after a successful cessation—all mean

that identifying a history of nicotine use is still critical in life insurance risk assessment.

Insurtech SaaS tools that leverage medical claims and prescription histories can help underwriters to instantly and effectively detect nicotine use. Carriers using Irix Prescription Data and Medical Data reduce the risk of missing or misclassifying smokers, tackle mortality slippage, and improve profitability while keeping applicants satisfied with a seamless and timely customer experience.

Smoking's durable impact on mortality and the high rate of relapse among people attempting to quit also call into question the common underwriting practice of rating people who may have no recent evidence of nicotine use similarly to those who have never smoked. Is it time to consider revising underwriting guidelines to more accurately reflect elevated mortality risk lasting far longer than a couple of years?

Notes

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About the Author

Jenna Fariss grew up surrounded by tobacco farms. Today, she is Director and Actuary at Milliman IntelliScript, where she helps carriers evaluate and implement insurtech innovations that add protective value and next-level risk assessment to their underwriting workflows and business strategies. In spite of her upbringing—or perhaps because of it—Jenna is passionate about clarifying the risks associated with tobacco use. She often joins forces with reinsurers to critically assess new tools and guide clients as they adopt new technology or adapt underwriting guidelines to reflect evolving best practices, including the use of Milliman's proprietary data to help clients better understand tobacco's remarkably persistent impact on mortality. With 20+ years of industry experience, she brings both a high-level perspective and hands-on practical experience to any discussion of risk in life insurance.