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THE UNDERWRITING QUIZ

FALU Club of RGA

Executive Summary *ON THE RISK is known for its scholarly articles on insurance topics. In keeping with this, the FALU Club of RGA offers a fun and challenging addition to OTR in the form of the underwriting quiz. This regular feature is meant to challenge the underwriting knowledge of you, the reader, encourage ALU class enrollment and promote ongoing professional education in general. If you would like to submit quiz questions of your own, or if you have any comments, suggestions or questions, please contact the FALU Club of RGA at RGAFALUClub@rgare.com. We look forward to hearing from you.*

So now we invite you to test your wits on this quiz. Are you smarter than a FALU?

1. A life-threatening complication of inflammatory bowel disorder is:
a) Rheumatoid arthritis
b) Toxic megacolon
c) Gallstones
d) Ocular manifestations

2. A joint that is composed of two bones held together by a fibrous capsule and lined with synovium is a:
a) Cytokine joint
b) Synovial joint
c) Pannus joint
d) Temporomandibular joint

3. Residual cardiac disease from Kawasaki's disease includes all of the following EXCEPT:
a) Impaired left ventricular function
b) Congestive heart failure
c) Mitral regurgitation caused by papillary muscle dysfunction
d)Stiffening of the coronary arteries

4. A complication of the incomplete emptying of the atria due to loss of atrial kick and pooling of blood in the chamber is:
a) Ischemia
b) Congestive heart failure
c) Embolic stroke
d) Myocardial infarction

5. Factors to consider when underwriting tetralogy of Fallot include:
1) Arrhythmias
2) Presence of right bundle branch block and left anterior hemiblock
3) Age at repair
4) Size of pulmonary arteries
   a) 1 and 2
   b) 2 and 3
   c) 1 and 3
   d) 1, 2, 3 and 4

Answers on page 77

The Academy of Life Underwriting will offer five ALU examinations on April 9, 2024:

ALU 101 ALU 201
ALU 202 ALU 301

The registration period for all ALU examinations opens September 1, 2023. Exam registrations are accepted through March 1, 2024; registration forms received February 1 – March 1, 2024, require payment of a late registration fee in addition to the regular exam fee.

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CALENDAR OF COMING EVENTS

2023

September 27-29 ACLI (American Council of Life Insurers) 2023 Annual Conference at the JW Marriott, Washington, DC. For more information visit www.acli.com.

October 1-3 LIDMA (Life Insurance Direct Marketing Association) 2023 Fall Conference at the Vinoy Resort, St. Petersburg, FL. For more information visit www.lidma.org.

October 4-6 TWUC (Texas-Wide Underwriting Conference) at The Woodlands Resort, Woodlands, TX. For more information visit www.twuc.org.

October 5-6 NEHOUA (Northeast Home Office Underwriters Association) 39th Annual Conference at the Sheraton Portsmouth Harborside Hotel, Portsmouth, NH. For more information visit www.nehoua.org.

October 10 ALU Webinar on "A Polyp Odyssey, Underwriting Polyps and Colorectal Cancer" with Chris Yiannias. For more information visit www.alu-web.com.

October 12 CUA (Chicago Underwriters Association) 2023 Fall Conference at the Holiday Inn Express, Chicago, IL. For more information visit www.chicagouw.com.

October 14-17 AAIM (American Academy of Insurance Medicine) 131st Annual Meeting at the Hotel Washington, Washington, DC. For more information visit www.aaimedicine.org.

October 19 CUF (Carolina Underwriters Forum) Meeting at the Hilton University, Charlotte, NC. For more information visit www.thecuforum.com

2024

February 25-28 ReFocus Conference at The Cosmopolitan of Las Vegas, Las Vegas, NV. For more information visit www.soa.org.

May 5 IUSG (International Underwriting Study Group) Meeting in Boston, MA. For more information visit www.internationalusg.com.

May 5-9 AHOU Annual Conference in Boston, MA. For more information visit www.ahou.org.

August 25-28 SOA (Society of Actuaries) 2024 SOA Life Meeting at the New York Marriott Marquis, New York, NY. For more information visit www.soa.org.

Regional, national and international underwriting association meetings and non-profit educational events of direct interest to underwriters can be promoted in *OTR*'s Calendar of Coming Events and at the ALU website - www.alu-web.com. Notify *OTR* of your meeting details by email to otr@ontherisk.com.

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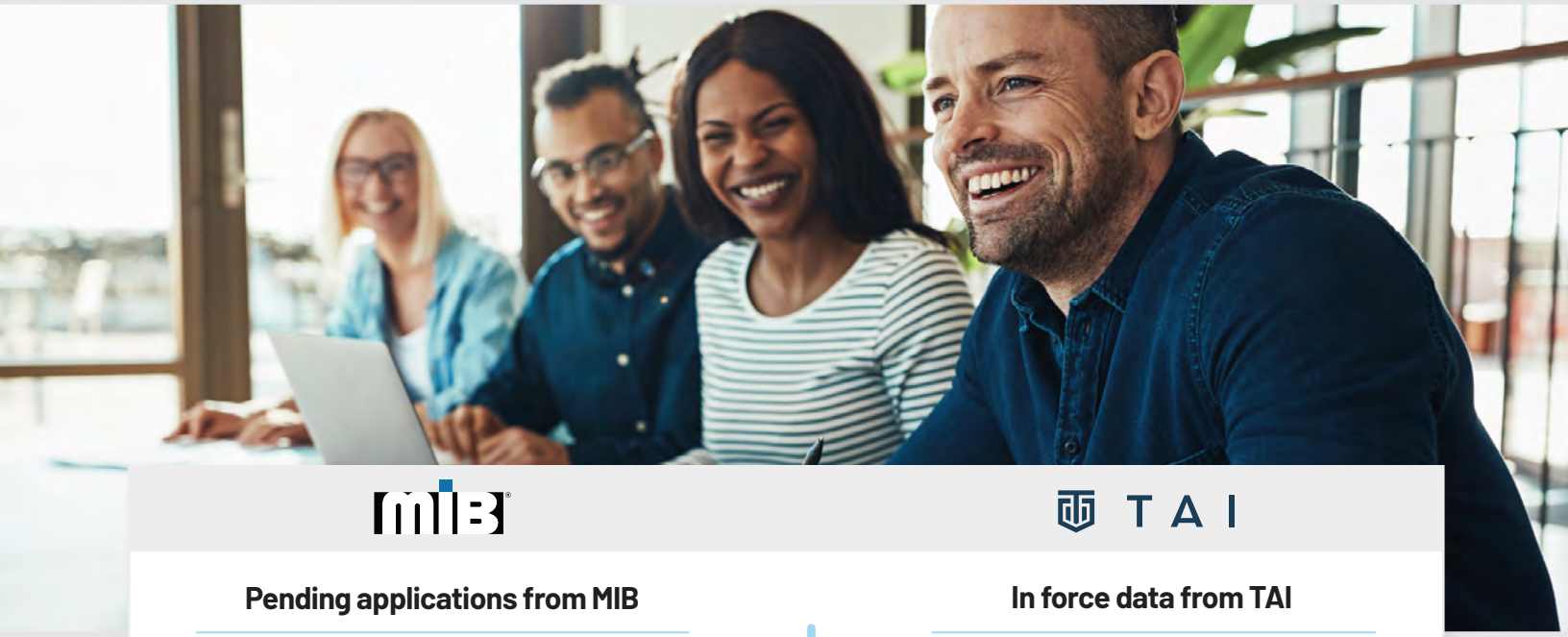

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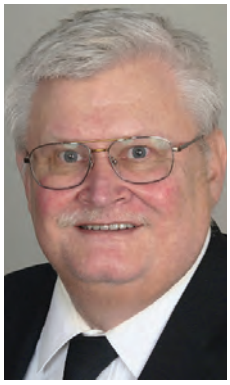
LOCAL, REGIONAL AND INTERNATIONAL ASSOCIATIONS NEWS: JUNE 2023 HIGHLIGHTS FROM THE ELHUA AND IUSG



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ELHUA News

The European Life and Health Underwriters Association (ELHUA) held its first webinar on June 19, 2023. There were 64 live participants (of 114 registrations), and it is anticipated that many who did not attend the live session will view it on the ELHUA.org website. This hour-long webinar had two sessions after the introductions: Introduction and greeting: Ana Villanueva (MAPFRE RE), President of ELHUA; *Start Your Engines! The Rise of the Underwriting Rules Engine. How We Got Here and Where We Go From Here* presented by Paul Donnelly (FINEOS); *Live Demonstration of a Digitalized Application Process* presented by Paul Triggs (Risk-Consulting).

ELHUA plans to have more webinars before the next ELHUA biennial conference, which will take place in Amsterdam, the Netherlands, in September 2024. For additional information, interested parties should write to Ana Villanueva at avillanueva@mapfre.com or visit the ELHUA.org website.

IUSG News

In the wake of its April 2023 meeting before the beginning of the AHOU National Conference, the International Underwriting Study Group (IUSG) designated a working group to explore the possibility of a hybrid session for its 20th anniversary in 2024 before the AHOU National Conference in Boston, MA.

An in-person meeting will still be the core of the session, and a virtual option may be added for a limited number of participants who are unable to attend the session physically. The working group will also be doing direct outreach to companies in other countries, especially in Latin America, to expand the range of participants. The group's official language is English; however, we will be contemplating online concurrent sessions in Spanish for Latin American underwriters.

Once again, the IUSG Executive Committee, on behalf of all attendees, wishes to thank AHOU for providing a meeting room to our group for the past 19 years, and to the sponsors that provided breakfast and coffee breaks.

The IUSG website at https://internationalusg.com has been expanded to include the group's history and a photo gallery.

THE INTERNATIONAL UNDERWRITING STUDY GROUP (IUSG) 2023

LOCAL, REGIONAL AND INTERNATIONAL ASSOCIATIONS NEWS: TWIN CITIES ASSOCIATION OF HOME OFFICE UNDERWRITERS SPRING SEMINAR

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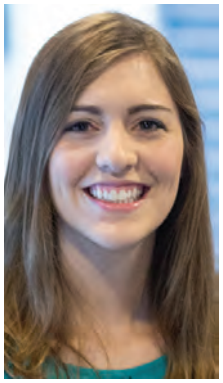

The TCAHOU (Twin Cities Association of Home Office Underwriters) Spring Seminar was held on Thursday, May 18, at Surly Brewing in Minneapolis, MN. The spring seminar is the first meeting of the calendar year for the organization, and the largest. The morning started out with a fabulous continental breakfast, followed by President Melissa McDevitt presiding over our annual business meeting. Past-President Lauren Ballentine was asked to put forth the slate of new officers for 2023-2024, and the membership ratified the officers and their new positions: Mike Hesse, President; Lori Walker, Vice President; Cami Taylor, Secretary; and Allison Vagt, Treasurer. Once the business portion of the meeting had concluded, we introduced our speakers.

Motor Vehicle Risk, Aviation and Avocations: Trends, Technology and Terminology

Mike Clift , GenRe

It was a lively discussion with lots of information and lots of laughs. Given our brewery meeting location, it was ironic to note that starting in 2025-2026, all automakers will be required to install an anti-drunk driving system in all new cars!

Women and Heart Disease

Dr. Charlotte Lee

Dr. Lee highlighted the differences between men and women and how they are evaluated and treated, as well as the effects of menopause, stress, etc. While we typically think of heart disease as predominately a man's issue, the reality is that more women die of heart disease every year than men. Given that fact, it was surprising to note that women comprise only 25% of participants in all heart-related research.

Expansion Continues for Accelerated Underwriting Programs

Dave Goehrke

Over the past handful of years, the underwriting landscape has transformed so much that in a way it is almost unrecognizable compared to that of even 5-10 years ago. In an industry that was always thought to be honest, fairly slow moving, invasive and time-intensive, we are seeing policies issued without an exam and lab work and, in some cases, within a matter of hours from the time of application. While we have the pandemic to thank for some of the "acceleration" of the change (no pun intended), this transition has been in the works for some time now.

Early programs in the mid-2010s had age restrictions generally of 18-50, face limits between $100,000 and $1,000,000, only consideration of term policies, and simply allowed the best risks. Now we have seen the face amounts, ages, products and rating classes expand to cover a much wider range of the population. We also have seen a significant increase in the number of companies offering this program. According to a Munich Re 2022 survey of those polled, only two companies had an accelerated underwriting program in 2012, compared to 25 in 2017 and 41 in 2022. Surprisingly, the largest jump in the number of companies offering accelerated underwriting happened between 2016 and 2017, which is an entire 3 years before the start of the COVID-19 pandemic. While COVID-19 was obviously not what started the movement, it absolutely pushed acceptance and expansion of these programs.

Our customers were no longer able to meet with agents face to face; examiners could not go out to people's homes or businesses; and doctors' offices

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were flooded with patients. At the same time, records requests piled up on the fax machine. We had to adapt, and quickly. We can see the impact there was on the parameters that we allowed through the programs (increased face amounts, ages, products, and according to Munich's study, 42% of respondents offer substandard rates via automated underwriting programs) along with the inclusion of new data sources (which in turn also increased the number of cases able to be accelerated).

Data sources have had a significant impact on the life insurance industry with the ability to obtain electronic health records, medical claim data and lab data in an incredibly short amount of time. It is easy to see how introducing these elements into the accelerated underwriting programs has turned the underwriting landscape on its head. We have the ability now to access all this information with just a signature from our applicants. No longer do we need to wait days or weeks to have an examiner sent out to our clients and take a significant amount of time going through exam questions, followed by blood and urine samples. So much of this information is at our fingertips and can be integrated into underwriting modeling and rules-based programs. The Munich Re study showed that since 2020 there has been a 32% increase in the use of medical claims data, 28% increase in lab data and 38% in EHRs.

While accelerated underwriting has made an impact on how we underwrite today, one aspect of these programs remains noticeably clear: we need to monitor these programs. We are too early in the stages of accelerated underwriting programs to have sufficient claim information to know how these models are performing, and if there is a lot of claim information, then it is likely not working well. The importance of random samples drawn and post-issue APS's should not be lost.

As we look to the future of these accelerated programs, it will be important that we master monitoring what we have in place before we continue to add more and more data to them. They will need to be adapted as we go, and ongoing scrutiny of the data we have will be essential.

All in all, it was a successful seminar with interesting topics and engaging and informational speakers!

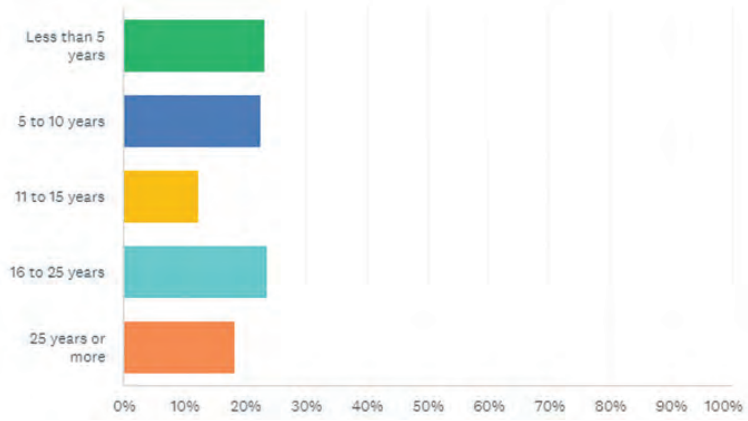
RESULTS FROM THE 2023 ACADEMY OF LIFE UNDERWRITING (ALU) SURVEY

Matt Williams, FALU, FLMI, ACS
Underwriting Consultant
Nationwide
Columbus, OH

This year the ALU Survey committee wanted to get your opinions and feedback of our current underwriting environment as we are coming out of what has been some of the most progressive changes our industry has ever seen. Our goal was to understand what these changes have looked like through your lens, and to see how well the industry has done as a whole in implementing and educating on these new tools. Our final questions were related to what an underwriter of the future looks like, because we know these jobs aren't going away – they are just evolving into something even more exciting. With nearly 1,200 respondents to our survey, we sincerely would like to thank you for your time and feedback. As a way to show our appreciation, the ALU has made a charitable contribution to Habit for Humanity.

As usual, we began our survey by gathering demographic information on our respondents. We first asked about the respondent's current role in their organization. Unsurprisingly, the majority (56%) of our respondents were production underwriters, followed by underwriting managers and directors. Interestingly, 12% of those surveyed were in underwriting R&D, auditing and forensic underwriting. These roles have increased significantly in recent times, indicating a greater focus on evolving data sources and post-issue reviews of accelerated business. There was also a wide variety in our respondents' experience in underwriting; 23% of respondents had under 5 years of underwriting experience, while another 23% had 16-25 years of experience.

How Long Have You Been An Underwriter or Involved With Supporting the Underwriting Function?



Industry Meetings

We first asked our respondents if they currently attend underwriting industry conferences and meetings. Of the respondents, 42% do not currently attend any industry meetings. Nearly as many respondents attend local meetings, while under 25% of respondents attend larger, national industry meetings. Of those surveyed, an overwhelming majority (77%) indicated that they would like to attend more meetings in the future. When asking respondents why they do not attend meetings, the main reason cited was that their companies do not provide the opportunity, as answered by 37% of those surveyed. There appears to be a strong yet underserved desire for underwriters to connect at meetings and conferences and to learn about new developments in the industry.

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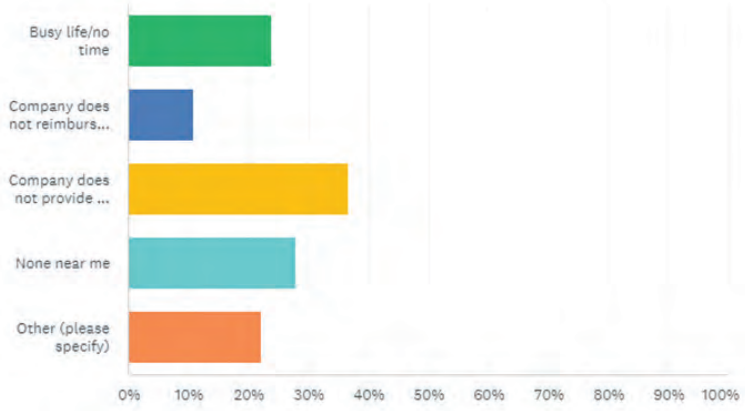
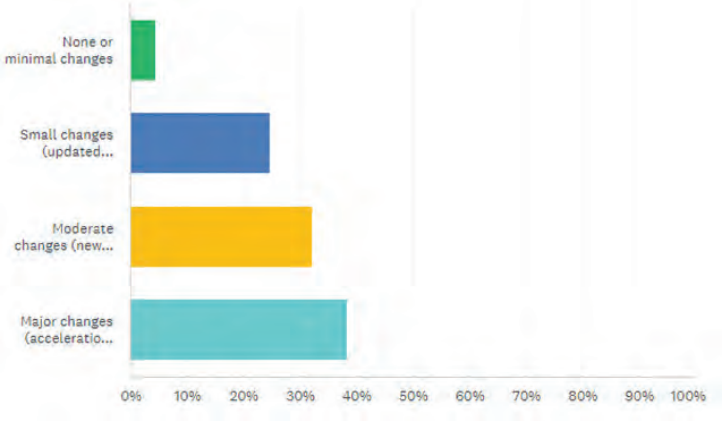


Changes in Underwriting - Training

From innovative and emerging technologies to the COVID-19 pandemic, our industry has undergone significant changes at a rapid pace. Most of respondents indicated that there have been major or moderate changes to their underwriting processes in the past 3 years (70%) including underwriting acceleration and modeling integration, fluidless underwriting and integration of new data sources.



We wanted to gauge how well our underwriters are responding and adapting to these changes. When asked of their preferred method of learning, an overwhelming majority of respondents indicated they prefer hands-on training and presentations, at 74% and 73% respectively. Encouragingly, most underwriters (67%) feel they are adequately supported and given the resources needed to learn how to handle new underwriting processes. Still, there is room to make our underwriters feel better supported. Those surveyed indicated that case studies and continuing education courses would help greatly with understanding the rapidly evolving changes in underwriting.

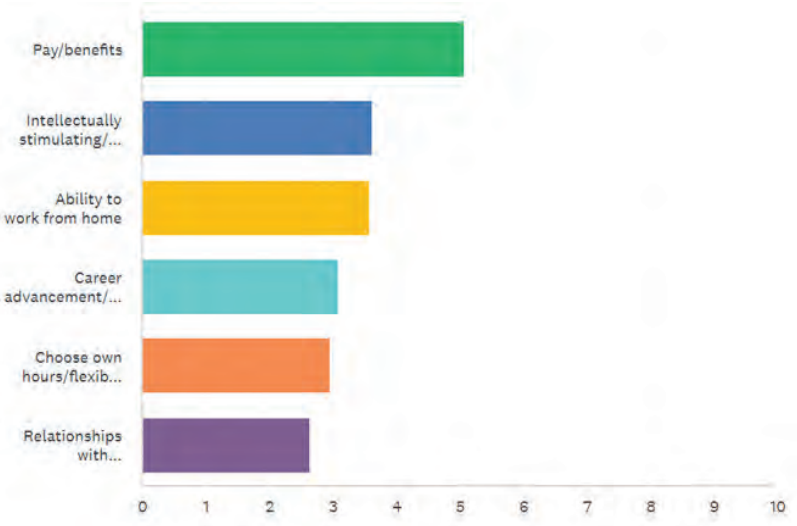
Changes in Underwriting - Current Role Impact

We wanted to see how underwriters have been affected by these substantial changes in the industry. Respondents were asked numerous questions about how these changes have impacted their daily work (daily case load, underwriting time, decision quality, etc.) as well as their confidence with new data sources and algorithmic underwriting. We also asked whether underwriters' stress levels have been impacted and if there has been an increase for personal growth and development.

Underwriters are always focused on making the right decision. New data sources, more efficient tools like APS summaries and predictive model/engine outputs may be driving the fact 43% of our respondents feel decisions have increased in quality. Underwriters more committed and confident in their decisions tend to be more productive. This is incredibly important when managing case work, which has clearly changed over the years with 50% reporting an increase in their daily work.

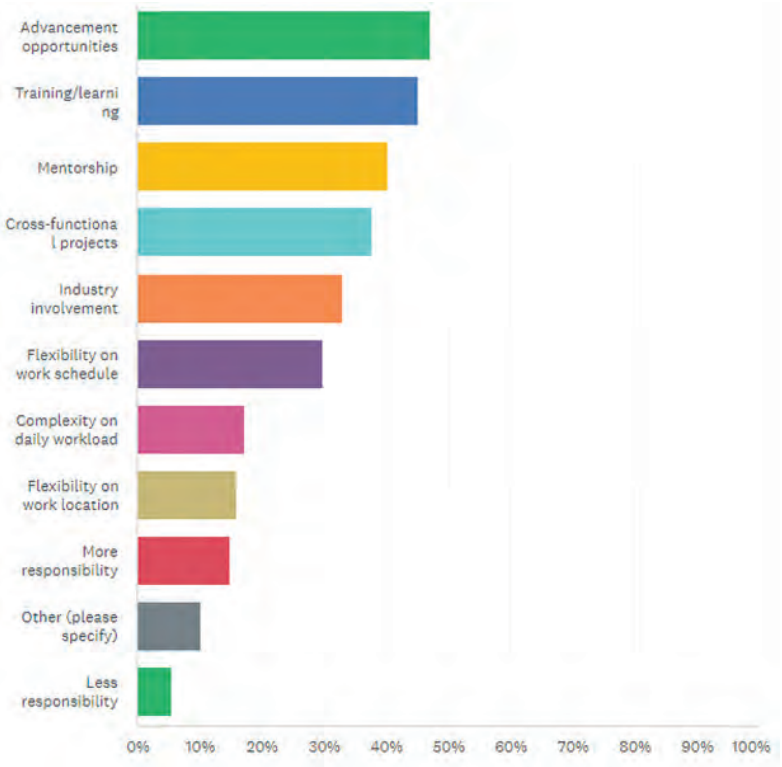
With an increase in daily cases, stress is also on the rise. While the changes in our industry have been exciting - better decisions, underwriters learning new data sources, more opportunities to extend beyond product case work, they are also causing stress. Since stress is so variable, underwriters and leadership should meet and discuss these issues together. While this may be a cause for concern, most of same respondents (45%) also indicated that there has been an increase in opportunities for personal growth and development. While change can be stressful, it can also provide new and exciting opportunities for our underwriters to branch out and flourish.

Outside of engagement, we also wanted our respondents to rank the importance of certain criteria related to their work: pay/benefits, intellectual stimulation, ability to work from home, career advancement, flexibility to choose work hours and relationships with customers and colleagues. Unsurprisingly, pay and benefits was ranked as the most important by 51% of all respondents. Nevertheless, the second most-valuable criterion was the desire for work to be intellectually stimulating and challenging, demonstrating a strong desire for underwriters to develop new skills.



Underwriter Engagement

When asked how often they feel engaged and inspired in their current role, 87% of respondents claimed they feel engaged most days or at least 2-3 days every week. This supports our earlier findings that, even with (or perhaps because of) the significant transformations in underwriting, underwriters appear to be more engaged and empowered than ever. Respondents were asked what would help them feel more supported and engaged in the future. The responses were varied, but a throughline was clear; underwriters are looking for more opportunities for education and development. The prevailing responses were for advancement opportunities (47%), training (45%) and mentorship (40%.)

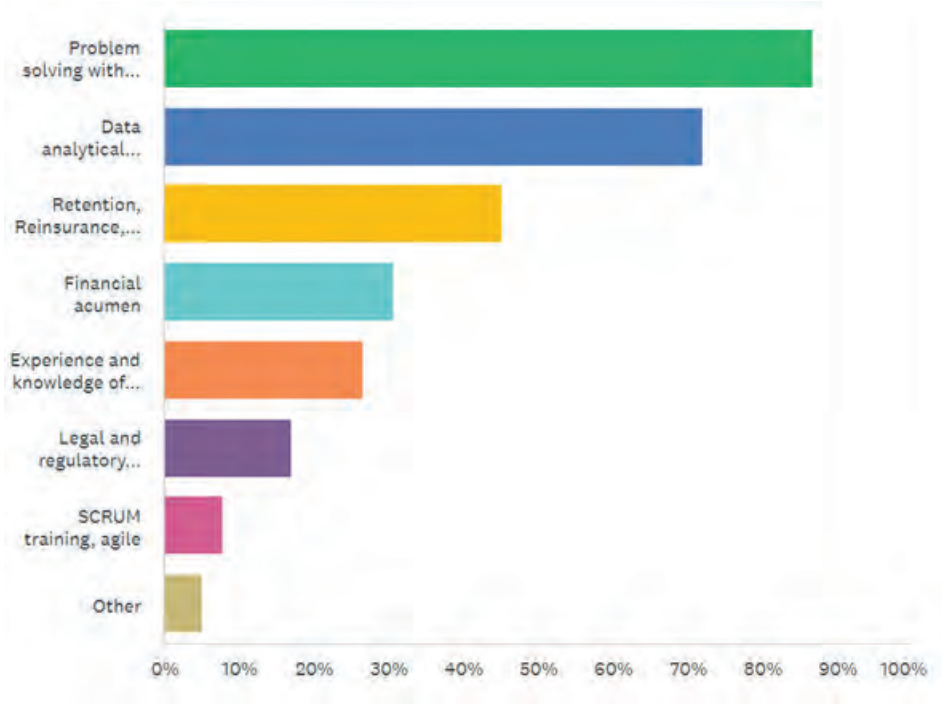


Training and Development - Underwriters of the Future

Finally, we wanted to close our survey by asking our underwriters to look to the future. First, we asked how their companies train new underwriters, with 56% responding that new underwriters are trained in-house from the ground up, either with or without industry experience. It is encouraging to see how many underwriting shops are training new underwriters.

For new underwriters, we wanted to know what our respondents thought would be the three most important skills (outside of medical training, customer service, and strong written and verbal communication) for the next generation of underwriters. Being able to solve problems with limited information was by far the most vital skill, selected by 87% of those surveyed. Having a strong mindset for data analysis was the second most important, being selected by 72%. These top two skills highlight the inherent challenge of life underwriting – interpreting numerous sources of data to ultimately make a final decision. As one respondent eloquently responded; "Being able to find the balance between the "science" of the data provided & the underwriting guidelines/parameters of the employer and the "art" of looking at the applicant as a "whole" (not the sum of their data points) to determine appropriate risk management."

Overall, the results of this survey are extremely positive. While the life underwriting community has endured widespread change in the past decade, underwriters have adapted well. Even with a bevy of new data sources and underwriting paradigms, underwriters are feeling very engaged with their role and wish to gain more knowledge and learn new skills to improve. They are eager for more opportunities and underwriting challenges. If we continue to provide support to our underwriters, they will continue to grow and thrive.



About the Author
Matt Williams is an Underwriting Consultant at Nationwide Financial. Currently, he a part of the Underwriting Innovations team, researching and implementing new and emerging technologies to improve the underwriting process. Matt lives in Columbus, OH and enjoys spending time with his wife, daughter and geriatric dog.

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INSURING THE INFLUENCER - PART 1

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Munich Re
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Executive Summary *This article provides a comprehensive overview of social media influencers, their work nature, and what life, disability and critical illness insurers must consider when underwriting this occupation. Social media influencers have become a vital force in the marketing industry, making it essential for insurers to evaluate their unique risks effectively. To do so, insurers must consider an influencer's social media presence, brand partnerships, content type and personal information, including age, health status, lifestyle habits and occupation. Underwriting social media influencers is a complex process with various factors to consider. This article is the first of a two-part series that will delve deeper into the importance of underwriting for social media influencers, its risks and challenges, and the best practices to manage them. By addressing these areas, insurers can effectively manage the risks while meeting the needs of social media influencers.*

Social media influencers have significantly impacted the marketing industry in recent years. With the rise of social media platforms like Instagram, TikTok and YouTube, influencers have become an integral part of brand marketing campaigns. This article will discuss the following factors and how they can affect insurability:

- What social media influencers are
- Content and nature of their work
- The types of influencers
- Their social media presence
- Brand partnerships
- Personal information

Social media influencers are individuals who have a large following on social media platforms and influence their followers' purchasing decisions. In addition, they typically have built a personal brand around their personality, lifestyle, expertise or interests. As a result, brands often seek specific influencers to promote their products or services to their followers.

The work of social media influencers varies widely depending on the type of influencer and the niche they operate in. For example, some influencers create content around fashion, beauty, travel, food or fitness, while others focus on topics like politics, social justice or entrepreneurship. Influencers use their social media platforms to create content in the following ways to resonate with their audience and build their following:

- Posts
- Blogs
- Videos
- Stories
- Podcasts

There are several types of influencers based on the size of their following and the level of engagement with their audience.

- Micro-influencers have a smaller following (up to 100,000 followers), but tend to have higher engagement rates and are often more niche-focused.
- Macro-influencers have a larger following (100,000 to 1,000,000 followers) and may have a more diverse audience.
- Mega-influencers have over a million followers and have a very diverse audience.

Celebrities are considered mega influencers and have the potential to reach millions of followers. Still, their content may not always be as relatable or authentic as micro- or macro-influencers.

A social media influencer's presence is one of their most significant assets. The number of followers they

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have, their engagement rates and the platforms they use all contribute to their overall reach and influence. The influencer's number of followers is one of the primary metrics brands use to evaluate their potential value as a partner. An influencer's engagement rate is also crucial, as it indicates how many of their followers actively engage with their content. Finally, the platforms an influencer uses can also affect their reach and influence. For example, Instagram is a highly visual platform and ideal for influencers who create content around fashion, beauty or travel. On the other hand, TikTok is a platform known for its short-form videos and is popular with influencers who create content around humor or entertainment.

Brand partnerships are essential to an influencer's income and overall success. Brands partner with influencers to promote their products or services to their followers. The types of brands an influencer partners with can provide insights into their reputation, level of success and income potential. Luxury brands, for example, tend to partner with high-profile influencers with a large following. In contrast, more affordable brands may partner with micro-influencers with a smaller but more engaged audience. The length of brand partnerships can also indicate an influencer's value to a brand. Long-term partnerships are a sign of a successful collaboration that has generated positive results for both parties.

An influencer's personal information can provide insights into their insurability and the level of risk they pose to insurers. Health status, lifestyle habits and occupation are all factors that can affect an influencer's insurability.

As with other insureds, insurers may view influencers who have a history of health problems as higher risk, which could result in higher insurance premiums or declination. Insurers may require additional information, such as medical records or paramedical exams, to appropriately evaluate the risk.

Influencers who engage in high-risk activities as either a lifestyle or occupation may have difficulty obtaining life insurance coverage. Certain types of content, such as extreme sports or dangerous stunts, are viewed as risky behaviors that increase the likelihood of injury or death. These behaviors may result in higher premiums, exclusions or un-insurability.

Similarly, influencers who create content around controversial topics, such as politics, may be seen as higher risk due to the potential for negative backlash from their followers or the public.

However, not all social media influencers are high-risk. Micro-influencers, for example, may have a smaller following and may not engage in high-risk activities, making them lower risk and easier to insure. In addition, influencers with a healthy lifestyle, good health and stable income may also be viewed as lower risk and more insurable.

Summary

Insuring social media influencers can be a complex process. Social media influencers have become a significant force in the marketing industry, and their influence will only increase in the coming years. As the popularity of social media platforms continues to grow, so will the demand for influencers who can reach and engage with audiences in unique and innovative ways. As a result, insurers must consider various factors when underwriting life insurance for social media influencers, including the influencer's social media presence, brand partnerships, content type and personal information. By carefully evaluating these factors, insurers can provide coverage that meets the needs of influencers while managing their risk effectively.

Part two of this article will provide insights into factors underwriters should consider when underwriting social media influencers. This will include risks and challenges pertaining to assessing income, career stability, and the potential impact of negative publicity or scandals. Best practices for underwriting social media influencers will also be discussed.

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About the Author

Jennifer Digiovanni, FALU, FLMI, ARA, ACS, is a seasoned professional with over 30 years of experience in the insurance industry. She has extensive expertise in direct life underwriting and reinsurance underwriting, having worked with various leading insurance companies. Jennifer is currently enjoying her role as a Risk Management Consultant for Munich Re, where she provides expert advice on Underwriting Initiatives and various areas of risk management. Jennifer is also an active member of ALU; she recently completed a term on the Exam Writing Committee and is beginning a new commitment with the Curriculum Group. In her free time, Jennifer is an avid quilter and cross-stitcher. She also enjoys spending time outdoors camping and playing with her two dogs – a white lab and a black pug. Her passion for underwriting and risk management drives her to stay up-to-date with industry trends and develop innovative solutions to help insurers effectively manage risks.

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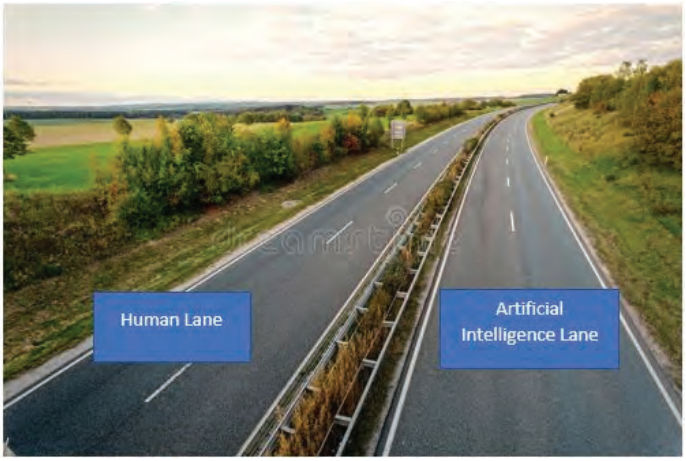
WHY NOW IS THE TIME TO FOCUS ON YOUR PERSONAL BRAND - A CALL TO ELEVATE HUMAN LANE UNDERWRITING

Michelle Roussin, AALU, ALMI, CHS
VP of Strategic Field Underwriting
BMO Private Wealth
Ottawa, Ontario
michelle.roussin.01@gmail.com

Executive Summary *How often and, most importantly, why do advisors ask for you personally to underwrite their most important files? If you are looking to elevate your professional underwriting brand, or wanting to learn what the advisor really wants from you, take 3 minutes to invest in reading this article. The author provides firsthand insights on what truly adds value for advisors in the field. She also offers some key best practices which can be easily adopted without needing resources. You hold the power of your brand and how Advisors see you in the equation to win. Human Lane Underwriting matters – your time to invest in your soft skills has never been so important. What makes you competitive as a Human Underwriter?*

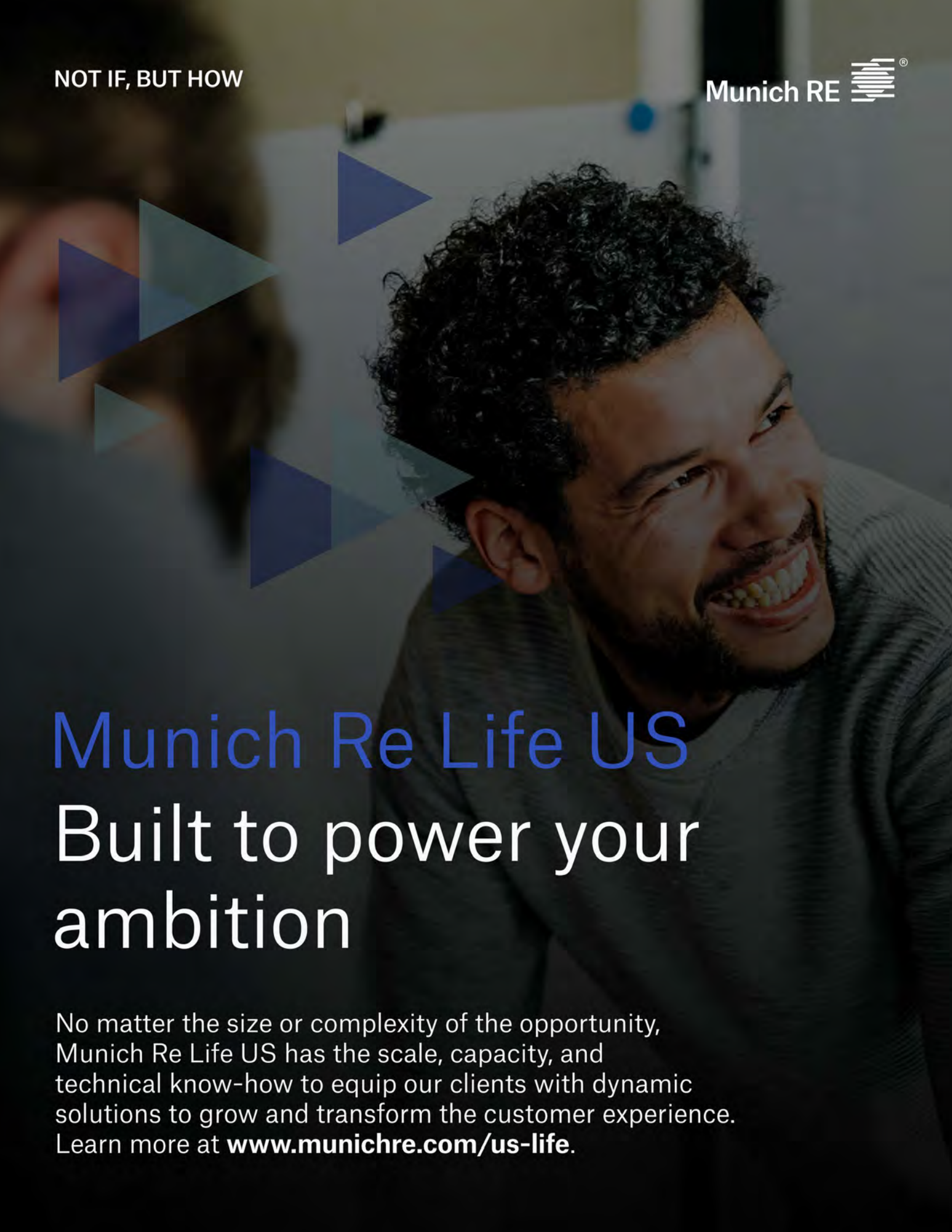
The author believes it's critically important to acknowledge human underwriting as a distinct lane that has just as much room for innovation and improvement as AI and predictive underwriting models. (*The thoughts expressed in this article are based on her own experience – over 40,480 hours of field underwriting...and counting!*)



Head to any industry underwriting conference and note the euphoria in the room as people discuss the role of artificial intelligence, predictive models and the potential of futuristic ChatGPT in the underwriting sights. You won't hear me argue against this type of innovation as it is incredibly valuable to the underwriting practice, but so is the innovation for Human Lane Underwriting - right? Sharing from a field perspective, as long as we are underwriting on human lives, which are ever-changing, the human lane underwriting will also need to adjust, grow and evolve to add a level of connectivity that machines, robots and AI cannot.

Human lane underwriting continues and will continue to be a significant part of the business model for larger and complex insurance cases. The connection, collaboration, trust and human-to-human service required in this segment of our business are unequivocally required by both the insurance carrier and the advisor. From where I sit, which is on the front lines with our clients, I can confirm that the underwriting experience we receive on our cases will continue to play a significant role in determining which insurance carriers will earn the trust of our business – increasingly so, as we face product parity across carriers and heightened expectations for the advisor and client experience.

As underwriters, we need to work together to continuously evolve and elevate our own "personal" brands and the underwriting experience we aim to deliver. We need to ensure a good portion of our professional development time is set to elevating the human side of what we do. Soft skills play a significant role in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human lane underwriting so let's ensure these are on point.

Now is the time for us to position ourselves to not only stay the course, but to position ourselves as an irreplaceable, essential element of large case insurance business. I often say that how we deliver a final underwriting decision is just as important as the decision itself. Business leaders, advisors and clients need to trust your final underwriting decision, and that often comes down to your soft skill set: the "art" of delivering or selling your decision. So ask yourself, does your professional development plan have you only learning about AI, or technical medical data and financials? Or does it also have you working on your softer skills to bring all of these together for trusted delivery and a trusted client and advisor underwriting journey?

The key question comes back to you: What are you doing to own and elevate your professional underwriting brand to remain competitive and to be in demand?

Action Plan To Elevate Your Personal Brand

1. *Reflect*: Your personal brand is how others see you, and what they say about you when you're not in the room. Even if people aren't saying anything negative, you often need to challenge yourself professionally to stand out so that they are saying anything at all. Looking at your answers, where do you see opportunity to elevate your personal brand?

   Take a pen and paper and write down the number of hours you've logged as a professional underwriter. (I personally have 40,480 hours logged and still counting. I am proud!) Next, write down the number of times an advisor or financial firm has asked that you be assigned to a specific case or cases, or all their business? Is it zero or 20? Be true to yourself as you answer. Next ask yourself how often this happens, and why you were chosen? What do they trust or like about you?

   As you interact with advisors and other stakeholders, continuously ask if your professional opinion came through clearly in your written and verbal interactions. Ask how you can improve or if they've been through other cases where things went more smoothly.

2. *Focus on becoming an extraordinary communicator*: In our profession, there is a minimum amount of communication with the field that is required to do our job. But, there is no maximum. Put an emphasis on the soft skills. Here are a few ideas on how to put this into practice:
   - *Acknowledge every introduction letter*. When an advisor takes the time to provide you with a letter that adds value, take time to acknowledge it and say thank you. Try to elevate beyond just a quick "thank you" (which is better than nothing), but clearly state how the letter added value to the file. *Example*: "Because you shared xx in both the application and introduction letter, I was able to approve the application financially; therefore, nothing further is required."
   - *Respond proactively to third party financial verification attached with the application*. Confirm the financial approval – just like with the introduction letter acknowledgement, move away from the mindset that "no news is good news" and communicate every step of the way with the advisor. If however you are not able to approve it based on what was sent, actually make a call (yes, try using the call feature of your phone!) to the advisor to explain why, or consider a one-time exception, or be very specific in a written communication. Reciprocate the effort that was made. Continue the dance.
   - *Respond to medical disclosure as it arrives*. This is another significant opportunity to make a powerful impact as an extraordinary underwriter. Consider providing an update on how things look, allowing you to stay active in your role as a communicator, create connection with the advisor, and avoid delays and any surprises. *Example*: "I am happy to advise that the labs and paramedical have been received. The labs and urine are normal. Please feel free to share this with your client as I am sure they will be happy to know. The paramedical had great disclosure, please thank your client for taking the time with the nurse. This confirmed we are with the right family practitioner for the doctor's report. Once we receive the final doctor's report, I will confirm a final decision or confirm if anything further is required. You are welcome to call me if you need to discuss further."

3. *Create a community of forward-thinkers in your organization*: Create an in-house human lane underwriting brainstorming crew. Get together with a few other underwriters once a month to talk about ways to improve the human lane experience. You will be amazed at what comes out of these. Ensure the crew is made of just a few key underwriters – if the room is too big, it will lose its effectiveness. Ensure each underwriter selected to be part of this group has a growth

mindset and a "how can we" attitude. The leader should come to each meeting with a live case to discuss. Together, you can think of ways to win a large case from a soft skill perspective (not the medical/technical aspects). You'll enjoy seeing your soft skill muscles stretch from this exercise!

These are just a few basic things you can start doing right away. They take no system work, no management approval, and are fully within your control as a Human Lane Underwriter. Try this on and measure your success after 12 months to see how this has impacted your brand. Give it time to have effect, impact and to catch on.

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About the Author

Michelle Roussin, AALU, ALMI, CHS, has been in the world of underwriting for 25 years. With over 40,000 hours of combined technical and field underwriting hours logged, she is an expert. Often teased as being the Erin Brockovich of underwriting, she prides herself on knowing every detail about a client when putting an application together. Passionate about bridging the gap between the advisor, client and underwriters, Michelle is the creator and founder of Strategic Field Underwriting, which is a place that gives clients a true voice during the underwriting process. It is a place that puts the start of the underwriting process, journey and accountability back to the advisor where she feels it belongs. It is a place that offers deep collaboration, trust and respect between all parties involved in the crucial art of underwriting. You can find Michelle on LinkedIn and presenting at various underwriting events.

MY TWO CENTS ON THE 2%: A STEP-BY-STEP GUIDE TO MULTIGENERATIONAL UNDERWRITING

Mike Hesse
Dayton, MN

Executive Summary *Multigenerational planning poses an attractive, yet challenging, opportunity to both direct carriers and reinsurers. Underwriters must consult with subject matter experts and estate/financial planning professionals to weigh the risks against the potential premium revenue generated. The central focus of multigenerational underwriting should be on whether appropriate planning has taken place and whether the proposed insurance fits that plan. Each case brings its own unique aspects, making highly specific guidelines impractical. Nevertheless, four main areas can serve as a guide to help carriers navigate multigenerational planning with more accuracy and efficiency: estate planning review, underwriting best practices, legal/regulatory risks and risk mitigation based on generation.*

"*In the US today the top 10% of the population holds 76% of the country's wealth, while the bottom 50% holds just 1%*" (Daugherty, 2021).

It is well understood that the majority of our nation's wealth resides in the hands of a disproportionately small number of people – and that it always has. The transfer of wealth from generation to generation, otherwise known as inheritance money, is a primary driver of this ongoing disparity.

For most American families, inheritances are relatively modest. Between 1995 and 2016, for example, more than 55% of inheritances were under $50,000. However, this 55% accounts for less than 6% of all inherited money. Meanwhile, the wealthiest 2% of the population is responsible for 40% of all money passed down through inheritances (Daugherty, 2021), contributing to a growing wealth gap.

Why should insurers care? For the answer, it is necessary to dig deeper into this 2%, which can be broken down into three main categories:

- *High-net-worth individuals (HNWIs)*: Liquid assets valued at $1-5 million.
- *Very-high-net-worth individuals (VHNWIs)*: Liquid assets valued at $5-30 million.
- *Ultra-high-net-worth individuals (UHNWIs)*: More than $30 million in liquid assets (O'Connell, 2021).

Although very small, consisting of only 521,653 individuals globally in 2020 (Bailey, 2021), the UHNWI group significantly impacts insurance carriers. The complexity of UHNWIs passing down inheritances, a process known as multigenerational planning, requires insurance to cover potential economic loss, such as tax liability, or liquidity concerns while transferring assets to maintain overall family wealth.

Even though this group is a subset of the 2%, their wealth makes up a significant portion of premium revenue for insurance companies, and this group is growing. In fact, from 2020 to 2025, the ranks of the ultra-wealthy will grow by 27%, according to Knight Frank (Bailey, 2021). Asia will see the most growth (39%), followed by Africa (33%). The US will continue to have the most UHNWIs by 2025, adding 24% super-rich individuals (Bailey, 2021). Therefore, wealth and inheritance gaps are an important topic for insurers globally, especially because UHNWI business is so complicated.

Each situation is unique in multigenerational planning based on a family's financial position, objectives and family dynamics. In most cases, using only traditional financial underwriting guidelines will not adequately address risks or support the insurance coverage requested, making it nearly impossible to create specific multigenerational underwriting

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guidelines. The best way for carriers to navigate these cases is to consider four areas: estate planning review, underwriting best practices, legal/regulatory risks and risk mitigation based on generation.

Estate Planning Review

The key in estate planning review is to prioritize plan design, asking key questions about the transfer of assets:

- What is the transfer plan?
- What is already in place?
- What has been executed?
- Where is verification that key estate planning steps have been implemented?
- What steps remain?
- When are they planned?
- What are the ages of the policy owner and beneficiary?
- How soon will the transfer happen?
- What will go to members of each generation?

If the transfer will not occur within 5-10 years, underwriting may consider "discounting" the value of assets being covered, or taking a more conservative approach for estate growth projection. If available, a life expectancy calculator can determine the life expectancy of Generation One. If Generation One's life expectancies are less than 10 years, it is reasonable to expect imminent transfer of assets from an estate planning perspective. For Generation One to Generation Three transfers, plans generally work only if Generation One's ages are 80 years or older.

Each generation's members should receive equal or proportionate consideration for coverage. This requires dividing the estate by the actual number of individuals in a generation, not just by who is insurable. Generally, disproportionate coverage for children/grandchildren based on statements that they will be "excluded" from trust assets should not be considered. Such plans may change, so assuming proportionate coverage makes the most sense from an underwriting and risk management perspective (e.g., with four children, each receiving 25%). Supporting significantly disproportionate coverage without a reasonable explanation can create reputational risk for the company and potentially place the child at harm.

It is important to watch for face amounts that are premium-driven. Reasonable consideration can be given to different death benefits when the cost of insurance varies based on age and gender if the same formulaic approach is used for all family members of each generation. Reviewing premium affordability and funding structure is important in this scenario.

The policy owner and beneficiaries satisfying planning objectives should be a central part of underwriting. Ideally, significant assets have already been transferred to the insured or a trust for their benefit. Similarly, for Generation One to Generation Three planning, it is best when a generation-skipping trust has been established and funded. Financial over-insurance or anti-selection can occur if Generation Two dies before Generation One.

In practice, most carriers include a review by in-house advanced marketing experts, usually an attorney with estate planning experience and deep industry knowledge. The ideal scenario occurs when an attorney is driving the sale and the agent sends an explanatory cover letter. On the contrary, when the first step in "planning" is to purchase life insurance prior to the wealth transfer plan or trust documentation being established, this may indicate anti-selection or coverage with anticipation of a windfall.

Underwriting Best Practices

Each case is often unique in multigenerational planning; thus, experienced underwriters should perform risk analysis on these complex cases and maintain open communication with producers/financial advisors along with internal subject matter experts. Favorable consideration can be given if the case fits within the producer's or brokerage group's normal target market. In other words, does the producer belong to a network of UHNW financial planning professionals and have a track record writing similar business?

To prevent anti-selection or potential over-insurance, Generation One's insurance planning should be mostly completed prior to Generation Two coming in for insurance coverage. An ideal situation occurs if a single team is handling the entire family insurance planning. Generation One should possess a minimum of $20 million in assets. Care should be taken to avoid assets being double-counted. Only one person can have "incidence of ownership" for a particular asset or share of an asset. If a trust has multiple beneficiaries, trust assets should be pro-rated for each beneficiary when calculating financial need. Third-party financials should be requested to demonstrate the true financial need for the trust.

For high-profile cases, an internet search that includes verifying real estate values online is in order. Getting to know a customer to understand sources of wealth is an important part of multigenerational underwriting for both domestic and international business. Wealth-X or Diligence International Group reports can help not only verify assets but also identify potential legal or reputational risks.

It is important to remain disciplined and not be overly aggressive, staying within normal underwriting financial guidelines. This includes securing third-party financial documentation from sources with knowledge of family assets and cash flow, such as a CPA, family office, estate planning attorney or wealth advisor, who are not directly compensated for life insurance sales. For taxes, the normal federal and state liability vs. the GST tax should be reviewed using a 40-55% tax rate. Financial documentation should be readily available based on prior estate planning, especially for long-term planning clients. Reasonable growth assumptions, especially for younger individuals in Generation Two, should be used, capping growth years at 20 or 25 years with more conservative growth factors. For assets held within a Family Limited Partnership with a track record of higher returns, more aggressive projection assumptions can be considered.

Unique medical aspects, such as the mental health and substance use of Generation Two and Generation Three, can impact multigenerational planning cases. Factors such as pressure to achieve and isolation from parents in upwardly mobile communities may well lead to high stress. In fact, affluent youth reported significantly higher levels of anxiety across several domains and greater depression. They also reported significantly higher substance use, consistently indicating more frequent use of cigarettes, alcohol, marijuana and other illicit drugs (Luthar, 2003). Another consideration is a potential lack of medical records. Many third-generation individuals do not receive routine medical care based on their age and relatively good health. For larger amounts of coverage, extra diligence should be taken to produce a full health picture. This can include obtaining prescription checks, medical claims data and advanced drug screening tools to identify unadmitted medications.

Legal/Regulatory Risks

In multigenerational underwriting, insurable interest must align with planning objectives. From a regulatory perspective, this requires understanding the definition of insurance vs. that of investment. Policies must meet normal life insurance definitions and non-MEC (modified endowment contract) qualification. These statutory conditions tend to drive up death benefit amounts, although 7702 cash-value plans allow for lower death benefits based on higher MEC and guideline premium test amounts.

Multigenerational planning cases come with several economic risks to consider:

- *Product design/capacity/profitability*: Do product design assumptions allow profitable premiums? Does the cost of capital and challenges of low interest rates make these sales unprofitable for carriers in the long term?
- *Concentration of risk within the family*: How can this be identified and managed (often hard to do, especially for reinsurers)? Is there a large exposure on a younger individual?
- *Reinsurance expense*: As most inheritance risks require a high proportion of reinsurance compared to the total death benefit, does the margin between premium and reinsurance rates allow for a reasonable profit margin for the insurer?

Risk Mitigation Based on Generation

Each generation demands its own risk mitigation practices. For Generation One, standard estate planning underwriting is appropriate, whereas Generation Two brings additional considerations. Distribution of equal shares and coverage that does not transfer from uninsurable to insurable individuals generally works best. Estate planning, including a trust, should be in place, and transfers should have occurred, at least a minimum 10% with specific plans for additional near-term transfers. In addition, the death benefit should reflect actual estate tax liability. However, some consideration can be made for expected inheritance if the life expectancy of the Generation One grantor is 10 years or less.

Generation Three brings even more complexity. Individual consideration should be taken based on plan design, usually a generation-skipping or other customized wealth transfer plan. This requires review by an internal advanced marketing group including the review of trust documents. A cap on asset growth projection at 20 years/6% growth should be considered. Death benefit amounts should be equalized and have a reasonable relationship to Generation One and Generation Two insurance in-force.

Additionally, substantial wealth transfers should have already taken place. An insured's personally owned assets and income will generally not support total amount coverage; the need for coverage must therefore be clearly defined within the estate planning structure to avoid the appearance of pure surrogate insurance or a potential windfall. Finally, over-insurance based on low cost of insurance at younger ages presents another concern, even for accumulation-focused products. For juveniles under age 18, caution should be used when supporting large total lines of insurance due to potential reputational risk or harm to the minor.

Conclusion

Although multigenerational planning focuses on rare UHNW families, this process poses an attractive, yet

challenging opportunity to insurance carriers. Underwriters must consult with subject matter experts and estate/financial planning professionals to weigh the risks against the potential premium revenue generated. The central focus of multigenerational underwriting should be on whether appropriate planning has taken place and whether the proposed insurance fits that plan. Each case brings its own unique aspects, making highly specific guidelines impractical. Nevertheless, the four main areas outlined above can serve as a guide to help carriers navigate multigenerational planning with more accuracy and efficiency.

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About the Author

Mike Hesse has worked in various Life Underwriting roles with Prudential, Sun Life Bermuda and RGA over the past 30+ years. Most roles have included High Net Worth risks submitted through Brokerage channels-both domestic and international. He resides in Dayton, MN, with his wife (Joy), dogs (Teddy, Minnie) and cat (Pablo). He has two adult children: Reid, 22, attends San Diego State University, and Linnea, 19, attends the University of Arizona. He graduated from the University of Southern California (BS/Finance) and obtained an MBA from University of St. Thomas in Minneapolis (Management). In his spare time, he enjoys travel, running, golf and reading history-related nonfiction.

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INTERVIEW WITH A LEADER: GRETCHEN JUNEAU

Gretchen Juneau, FALU, FLMI
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About the Subject *This is an interview with Gretchen Juneau. She currently serves as Vice President of Traditional Underwriting for Prudential. She began her career as a Prudential underwriter many years ago and has been in her current position since June 2022. Gretchen oversees the ILI Underwriting Department, as well as the ILI Medical Department and the Research Services Unit. She is responsible for articulating the vision for the underwriting department and embracing new underwriting methods, factoring in technology and algorithmic-driven underwriting concepts. Prior to that she was responsible for identifying opportunities to transform the underwriting process for our clients, producers and underwriting staff. Gretchen earned her bachelor's degree as well as her master's degree from the University of St. Thomas in St. Paul, MN. Gretchen earned her FALU in 2010 and has her FLMI and ACS designations. She currently resides with her husband in the Minneapolis area and is an avid Minnesota Gopher fan.*

Describe a leader who engaged and inspired you. How did you change as a result of that leadership?
I have worked with a lot of inspirational leaders over my 35 years in the industry. Each of them has had their own style as well as different perspectives that have helped form who I am as a leader today. Both a friend and a mentor, Denise Holmgren was one of the most inspiring leaders I worked with. She was one of the first underwriters that I met at Prudential (a long time ago!) and her professional style was something I admired for many years. Here are a few key learnings that have stayed with me over the years: (1) Always be prepared for a meeting; (2) Anticipate the next question; (3) Don't be afraid to fight for what you believe in (but have the facts ready to back it up!).

Mike McFarland and Tom Farrell were Chief Underwriters at Prudential when we were building the accelerated underwriting process. Their insights stick with me to this day and I still quote Mike, "You can do anything you want as long as you price for it."

My dad has always been my mentor and my biggest supporter. He worked with computers long before they were the norm, in an era when women were rarely in leadership positions. Yet he always told me that I could be anything that I wanted to be and to never let anything stop me from chasing my dreams.

What leadership characteristic do you possess that makes you most effective?
Unlike most people, I really like change. While I am truly an underwriter at heart, I have had a lot of different jobs within the Underwriting Department. I have helped design new underwriting platforms, written guidelines and procedures, helped build and then ran a service team for our agents, and revamped our Quality Review process (that one I volunteered for after getting a QR error for using ink instead of pencil in my file; yes, I know that makes me really old). Prior to my current role, I collaborated with our Data Science team to build our current accelerated underwriting process. I like to challenge the status quo and consider myself fairly inquisitive. I like to ask questions to generate new ideas.

Can you describe a situation where this characteristic helped you and your team?
I've recently challenged our underwriting leadership team to look at everything we do as a department and break things down into smaller pieces. From there, we're analyzing each activity and asking ourselves three questions: (1) What are all of the components involved with this task or activity? (2) What has changed since we started doing this? (3) Do we still need it OR is there a better way to do it? Our goal is to

focus on activities that add value and eliminate things that don't (those pesky reports that we've been generating for years but no one looks at), and automate or streamline the things that DO add value. My inspiration is from a book called *Big Little Breakthroughs* by Josh Linkner. Excellent read for anyone who loves change management or innovation!

How do you approach employees to help them grow in their careers?

I consider myself to be a lifelong learner and at this point in my career I consider it my duty (maybe my honor) to share my knowledge with others. Underwriting has changed a LOT in the past few years and will continue to change going forward. Underwriter skill sets need to change to match the new way of doing business. So I find articles or white papers from reinsurers and vendors about new underwriting requirements or processes and share them with my team.

I also recognize that not everyone's growth journey is the same. If you are balancing work + family/kids, taking an ALU exam every year may not be for you. But knowing what is going on within the industry may only take a few minutes a day and goes a long way toward developing your perspective on future changes.

Can you describe a failure or setback that helped you learn?

When our kids were young, we made a family decision to have me take a step back in my career in order to have more balance in our lives. I worked part time for about 8 years, some of that in our new business area (outside underwriting), but I always considered it a short-term detour in my underwriting career. Then came the day when I was ready to return to full-time work. Excited and a little nervous, I walked into my manager's office and told him I was ready to come back full time and discuss next steps in my career, and then he abruptly told me that I had no career path since I had made the decision to work part time many years ago. Wrong answer! I started talking to other leaders and found myself a new job in our underwriting guidelines area! I've never let anyone tell me that I can't do something.

How do you help a new employee understand the culture of your organization?

Culture is a hard thing to teach to a new employee… it's something you have to emulate through your actions and your words. We have been focusing on three things this year: delivering a great customer experience while being Risk Smart and using data to our advantage. It's not rocket science or anything new to those of us who have been underwriting for years, but something we need to think about every day as we embrace innovation and change. One thing I try to do is share as much as I can about WHY we are doing things. You get better buy-in when people know why they're asked to do something a particular way.

What words of wisdom do you have for new leaders?

A couple of things come to mind. Get involved. Be inquisitive. Develop the habit of finding time in your week to read/explore new things. Don't wait for your idea to be "fully baked"… just share it and let others help you develop it into something awesome (particularly applicable to women leaders). Grace and trust go a long way with your team. Know when to let go. (I'm still working on this one, just ask my current team!) Be authentic because others will know if you're not. And my favorite – You CAN have it all, but maybe not all at the same time. Enjoy YOUR journey!

Is there something you struggle with in your leadership position?

I'd like to think that I've figured it all out, but I'm still learning too! I occasionally struggle with time management and focusing on the right things. I like things "my way" and sometimes have a hard time letting others do things their own way. I feel great joy when something gets implemented quickly and can be impatient when things take a long time. Oh, and I wish everyone had my work ethic – ha ha. Luckily, I work with great people and we balance each other out very well!

EXERCISING OBJECTIVITY IN A SUBJECTIVE REALM: COMPELLING APPLICATIONS OF RISK ASSESSMENT IN MENTAL HEALTH

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Executive Summary *It has been evident that the past few years of the COVID-19 pandemic have challenged many people physically, emotionally and, most of all, psychologically. The increase in prevalence of mental health diagnoses and associated symptoms has resulted in an immense need for a novel risk-based approach to such a wide array of diagnoses. When assessing risk in this domain, one can evaluate the numerous side effects, symptoms, treatments and outcomes of the condition on a person's functional capacity. The goals of this article are to highlight thought-provoking assessments within the realm of mental health, and to provide effective applications of risk assessment through the examination of case studies, given the subjective nature of the topic. This approach requires a better understanding of dosages of medication, what evidence to order, how to profile symptoms that have resulted in clinical improvement or lack thereof, and an assessment of the impact on lifestyle with diseases such as attention deficit hyperactivity disorder (ADHD), bipolar disorder (BD), major depressive disorder (MDD), anxiety and schizophrenia/schizoid disorders. The key is first, in knowing if a comprehensive amount of information has been collected, and secondly, in evaluating if that "snapshot" is sufficient to provide for a high level of accuracy in the overall risk assessment of the particular diagnosis in mental health.*

Introduction

The Diagnostic and Statistical Manual of Mental Disorders 5 (DSM 5), that is published by the American Psychiatric Association (APA), is utilized by medical doctors/psychiatrists in North America and globally to categorize and diagnose psychiatric disease. The DSM 4 had initially introduced a multi-axial system (Family, 2023). Axis I is made up of mental health and substance use-related diagnoses that could result in significant impairment (i.e., mood diagnoses, anxiety-related diagnoses, schizophrenia and eating-related diagnoses). Axis II is made up of personality and intellectual disorders (i.e., histrionic, multiple and obsessive/compulsive disorders). Axis III is made up of general medical diagnoses that may result in anxiety and/or depression. Axis IV consists of environmental and psychosocial criteria that may influence a person. Axis V is a rating scale referred to as the Global Assessment of Functioning that ranges from 0-100 and symbolizes the level of successful functioning in a patient's life (i.e., 10 is at risk of hurting oneself or others, and 100 is no symptoms at all) (APA, 2022).

Although these categories are helpful for clinical diagnoses, different categories are utilized for underwriting psychiatric diagnoses, based on the main risk categories that are experienced often in insurance. Mental health disorders are viewed as falling into three major categories: anxiety-related disorders, adjustment disorders and mood disorders. The diagnoses that are often seen on insurance applications are ADHD, BD, depression, anxiety and schizophrenia/schizoid diagnoses, to a lesser extent.

Interesting Disorder-Specific, Risk-Related Considerations:

1. ADHD: It is clinically thought that ADHD is considered chronic, where the onset of symptoms and diagnosis is prior to adolescence. Many people also have symptoms that continue after their teenage years and into adulthood (Austerman J., 2015). Clients who are diagnosed with ADHD can

often have additional comorbid disorders such as depression, disruptive behavior disorders or substance abuse, which can also affect the treatment plan and compound the risk. Therefore, the area of most interest to risk is the functional capacity of a person with ADHD and whether they are stable on medication in work, family life and society. This can be challenging to assess because unlike diagnoses of depression/anxiety, which are commented on in detail by physicians, the main concern for ADHD is its impact on lifestyle. Reports from schools or employers are not received, and information is often heavily reliant on applicant disclosure (self-perception is subjective).

2. *BD*: Bipolar disorder has high periods that include mania/hypomania and low periods that include depression. This diagnosis can come with a higher rating when compared to anxiety and depression, unless it is controlled for several years with stability on medication/therapy (Swiss Reinsurance, 2023). This diagnosis, from a risk perspective, can be tough to evaluate accurately, as there are many unpredictable changes that can result in sudden and severe despair/distress that affect lifestyle and daily functioning. Underwriters can consider favorable risks for this condition by looking for patterns of consistency, less frequent episodes of mania, and longstanding medication use without major increases in dosage.
3. *Depression*: Depression (major or minor) can manifest as a constant feeling of sadness and/or a lack of interest in daily life/activities (Mayo Clinic, 2023). The associated symptoms are experienced differently by each person; two people with identical diagnoses can have opposite clinical trajectories (Monroe SM, 2022). The crux is in differentiating profiles and defining an accurate risk on both ends of the spectrum with clients who have the same diagnoses but different clinical profiles/responses to treatments.
4. *Anxiety*: The concept of anxiety itself is so broad, which can be challenging to start. It is defined as a feeling of worry, nervousness or unease about an event with an unknown outcome. Moreover, there is such a wide range of anxiety diagnoses and anxiety-related disorders. It might be difficult to evaluate the severity of the anxiety itself (i.e., a mild and situational type related to an exam or flight vs. debilitating GAD and agoraphobia with palpitations), if few details are given on the application (which is often the case).
5. *Schizophrenia*: This diagnosis occurs in males more often than females. It results in a fair percentage of patient hospitalizations despite the availability of prescription medications. The condition can include hallucinations, delusions, alternations of speech and catatonic manifestations, and often results in a lower level of functioning post diagnosis when compared to before the actual diagnosis (Swiss Reinsurance, 2023). The aim of assessing an accurate risk in this case would be to identify which prognosis category the insured falls into (i.e., (1) the group that shows recovery and improvement rapidly post medication and can function well in their occupation and socially, (2) the group that improves but requires heavy support or (3) those that are unimproved in their symptoms despite medication and end up being hospitalized).

Questions Applicable to Mental Health

What questions are asked on the application and/or on mental health questionnaires?

1. Name and date of the diagnosis.
2. Date of first and last symptoms.
3. Start/end of treatment.
4. If there are/were any changes in dosage - amount and dates.
5. Time off work – amount and dates.
6. Hospitalization or emergency visits - dates and circumstances.
7. Any suicidal attempts or ideations.
8. Practitioner involvement and frequency of visits.
9. Other comorbid health conditions.
10. Any substance use/abuse.

Reviewing these questions provides an understanding of how the risk should be perceived for each disorder, and aids the underwriter in deciding what evidence is needed to try and put an offer on the table. This process is further illustrated below through five compelling case studies that provide unique insight into various diagnoses, evidence options and outcomes.

Case Studies

Please note that these case studies are for reflective purposes and are made up of fictitious elements only. These do not, in any way, represent any real individuals. The intent is for cases to be solely utilized for learning purposes.

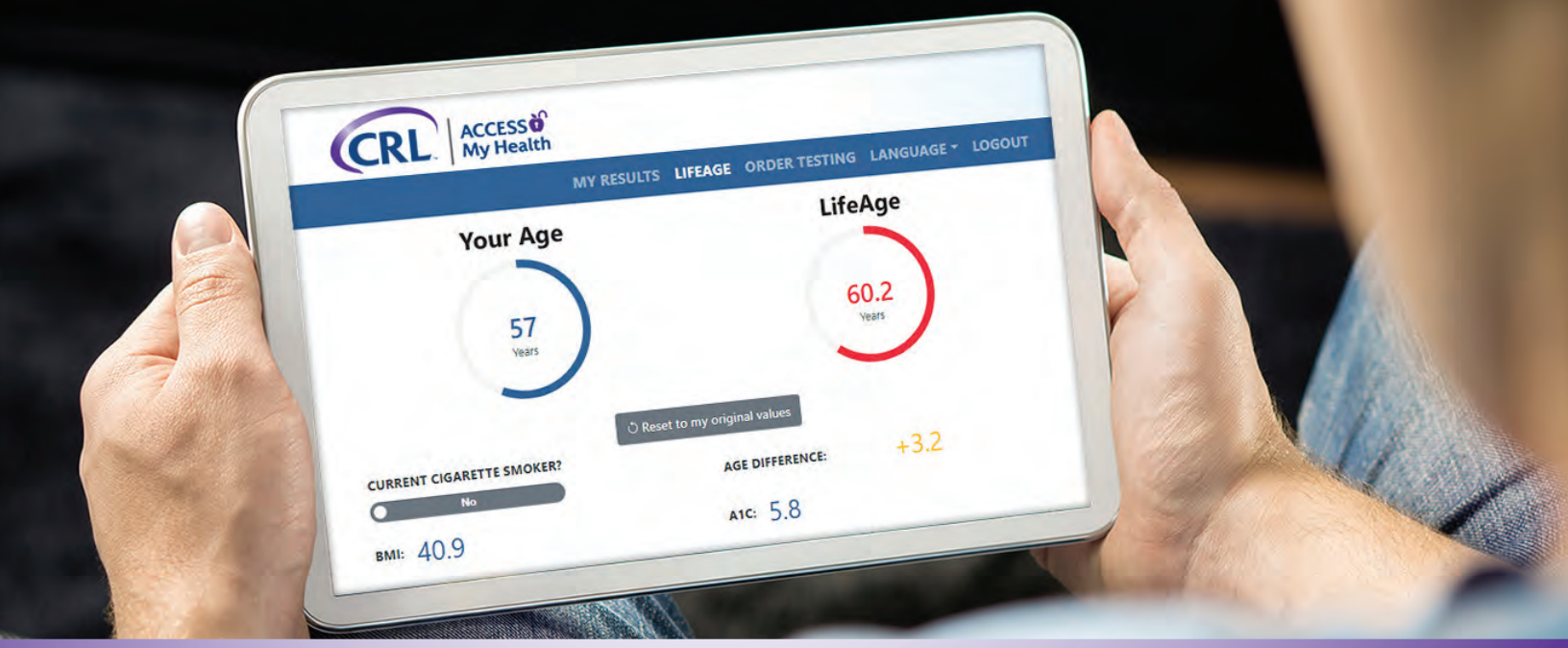
Case 1

Male, non-smoker, 38 years of age, applying for 1.5 million Term.

Application disclosures:

Occupation: Police officer

Medical: Depression diagnosed 10 years ago, bupropion, followed every month by psychiatrist, 4 weeks



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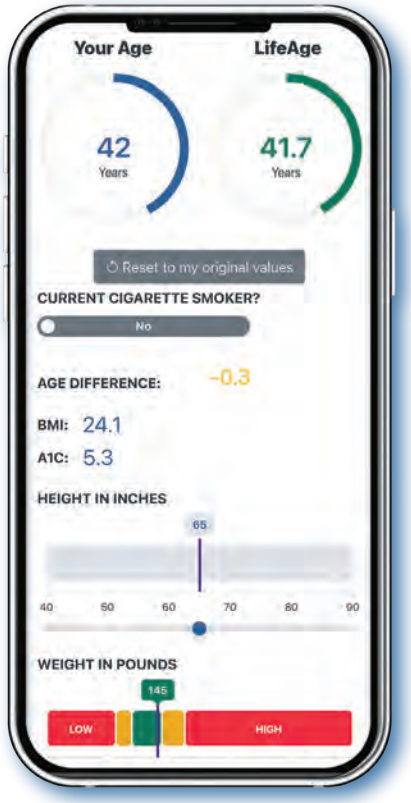

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off work around the time of his separation - the same year as diagnosed, no hospitalization, currently stable on medication.

Mental health questionnaire: Last symptoms 1 month ago, on Bupropion, followed monthly by a psychiatrist.

Attending physician's report (APS): Major depressive disorder diagnosed 10 years ago, initially Wellbutrin 150 mg daily, patient saw psych, could not work for a few weeks due to marital difficulties. Nine years ago, admitted to emergency room for putting an unloaded gun into mouth. Release and followup with psych 24 hours later. Currently stable on medication.

Food for thought:

a. If there was merely reliance on the application disclosures and the mental health questionnaire, there would not have been any receipt of knowledge of the information on the suicidal attempt.
b. It can be argued that the client theoretically answered "no" correctly to the hospitalization question because he had a stop in at the emergency room, and did not check into the hospital as an in-patient per se.

Takeaway:
Consider the wording of questions on the application; do these capture all parts of the risk?

Case 2
Female, smoker, 17 years of age, applying for 800K Par.

Application disclosures:
Occupation: Student

Medical: Anxiety diagnosed 4 years ago, lithium, then switched to lamotrigine, visits to counselor every 2 weeks this year for stress coping, has a hard time attending school daily but maintains 80% attendance.

Decision to order APS right away: Bipolar disorder diagnosed 5 years ago, was prescribed lithium 300 mg twice daily and then changed to lamotrigine 300 mg per day, difficulties at school and in relationship with parents. Patient seems to be tolerating medication now. No suicidal attempts nor ideation. Irritable bowel syndrome (IBS) diagnosed 6 years ago - colonoscopy normal. Very distracted and not focused at school, finds it hard to sleep. Currently being reviewed for possibility of ADHD - pending workup. Symptoms disruptive to home and school life - current dated per dictation.

Food for thought:

a. If there was merely reliance on the application disclosures, the correct diagnosis may not have been known. The actual diagnosis was much more severe.
b. Face amount and young age are triggers to order an APS for the medication listed and frequency of practitioner visits.
c. Consider comorbidities - smoker, IBS symptoms, noted young age and stress-coping abilities.
d. She is frequently followed by practitioner, but pending an ADHD investigation and already has lifestyle impact (missed school and family issues).

Takeaway:
Consider saving time by ordering the best requirement to provide the most accurate risk when there may be multiple triggers: a young age of diagnosis, inconsistencies in reporting of diagnosis/symptoms, comorbidities and lifestyle impact mentioned (i.e., APS ordered initially and right away).

Case 3
Male, non-smoker, 53 years of age, applying for 5 million Universal Life.

Application disclosures:
Occupation: Head of Research, Bank of XX

Medical: Anxiety diagnosed 8 years ago alongside obsessive-compulsive disorder (OCD) treated by cognitive behavioral therapy (CBT) monthly and lorazepam daily. Medication dosage has only increased once 2 years ago, time off work 2.5 years ago during company restructuring and role changed at work.

Age and amount APS: OCD and anxiety - diagnosed 9 years ago. Symptoms manageable, seems to be doing well on lorazepam 2 mg daily. Client obsessed with washing hands and arranging desk, does not seem to affect work or daily routine much, complaints of ruminating. Stable on medication. Check-in is mainly to renew medication.

Food for thought:

a. Consider how occupation may play a role: Client is in a demanding/possibly stressful job and he seems to be coping well (differentiate situational causes of the diagnosis vs. longstanding/major triggers).
b. Consider dosage changes alongside the date of the last reported symptom; how the client is doing after the dosage change is telling of his current risk (this client has been stable since the dosage increase 2 years ago).

Takeaway: What constitutes a lower risk profile for mental health? A diagnosis where the client has been on medication for years without major dosage increases, controlled symptoms, fewer triggers/well-managed triggers (i.e., work) and may be followed infrequently but sufficiently. There is also minimal/no lifestyle impact in low-risk cases.

Case 4
Female, non-smoker, 67 years of age, applying for 180K Term.

Application disclosures:
Occupation: Retired

Medical: Diagnosed with schizoid disorder 20 years ago. Doing well on medication.

Paramedical: Diagnosed with schizoid disorder over 15 years ago, last symptoms 1 year ago, prescribed Prozac daily, sees psychiatrist every 3 months, no hospitalization.

Decision to order APS: Client diagnosed with schizoid disorder, suicidal ideation 10 years ago, paranoia daily about the neighbors harming her so she finds herself distracted from doing daily activities that are necessary. Some days she will not leave the house. Current medication is Prozac 40 mg daily. No hospitalization nor ideations in the past few years.

Food for thought:

a. Consider whether an APS would be ordered on a lower face amount, given the diagnosis. Would a mental health questionnaire suffice with a rating or does the diagnosis require clinical confirmation?
b. Consider the frequency of symptoms and follow-up to provide an accurate rating. The client has infrequent follow-up considering the nature of the diagnosis, but does have daily symptoms.

Takeaway: How do you reconcile a more involved diagnosis with a lower face amount and the associated costs of ordering more evidence? If the client has daily symptoms but they do not manifest into serious consequences (i.e., suicidal ideations, hospitalizations) perhaps they could be viewed as more favourable.

Case 5
Female, non-smoker, 57 years of age applying for 750K Par.

Application disclosures:
Occupation: Disability case worker, retiring in 6 months

Medical: 30 years ago: bulimia, followed by heavy alcohol use, counselling, 10 years ago - Alcoholics Anonymous (AA) and now no alcohol use, drug use 30 years ago for 1 year - checked into a treatment facility, nothing since then. 5 years ago: depression since spouse passed away - Celexa 40 mg daily.

Model-based blood and vitals: Build 5.7.280 lbs., blood pressure 145/90, liver enzymes and all else normal.

Decision to order APS right away: Remote history of alcohol and drug use over 15 years ago - patient admitted to five drinks per day at that time, poly drug admittance of mushrooms, cocaine weekly for several months. Traumatic life circumstances of physical abuse also remote. Abstained from drugs and alcohol since then and joined AA for 10 years now, been a patient for 14 years. Weight fluctuation, remote history of bulimia over 15 years ago. Current weight 5.7.265 lbs. (dictation 3 months ago). Pending bariatric surgery - awaiting referral/to be scheduled in the next 2-3 months.

Food for thought:

a. A fresh viewpoint: Normally, substance abuse and mental health might favour a decision to decline. However, the complexity lies in the fact that the abuse was very remote (i.e., use of alcohol and drugs was 30 years ago and has been abstinent and a part of AA for many years). Moreover, there have been no known relapses.
b. How do comorbidities overlap in terms of the risk (i.e., depression and grief)? Fairly recent but stable control of depression; appears situational due to spousal death. Are there any patterns on the application or evidence of recurrence from old diagnoses? In this case, yes; remote eating disorder, however, fluctuation of weight on and off and now pending bariatric surgery that was not disclosed.
c. How does an evaluation of non-disclosure take place in the context of the case? The client disclosed many detailed items of her health and personal history including substance abuse but left out the pending bariatric surgery.

Takeaway:
The guidelines and manuals are a good starting point; however, the case can be taken beyond these to offer in certain circumstances, depending on the situation. Each mental health case needs to be evaluated uniquely, so that the best offer can be put forward. (i.e., perhaps if there was no pending bariatric surgery and it were only a favourable management of remote substance abuse and controlled recent depression

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that existed, a rating could be considered in lieu of a postpone/decline).

Challenges and Conclusions

There are several challenges that are noted when approaching risk assessment in mental health. These include but are not limited to:

a. Subjectivity in the evaluation of symptoms and response to treatment.
b. A lack of detailed information or follow-up from the general practitioner.
c. Possibility of discrepancy with the patient's account of disease management vs. actual and/or physician-reported accounts of the diagnosis at hand.
d. Navigating the risks in between categories in risk manuals.
e. Phrasing of mental health application questions/questionnaires that could miss capturing certain aspects or the holistic nature of the risk.
f. Perception of frequency of follow-up/care/dosage.
g. Understanding if and how the pandemic has compounded the effect of triggers or symptomatology on the basic level of risk in the diagnosis.
h. Analyzing the implications of trying to challenge declarations post issue with respect to material misrepresentation or fraud.
i. Overlapping ratings of mental health and similar diagnoses (i.e., chronic pain). Interestingly, depression and pain share similar neurotransmitters and pathways in the brain (Bair MJ, 2003).

It is evident that the answer to accurate risk assessment in the realm of mental health requires a careful look at the challenges mentioned above, and an implementation of methods that overcome these shortfalls. It requires an understanding that clinical trajectory and prognosis can vastly differ in individuals with identical diagnoses. Additionally, it requires a scrutiny of the sources of information received and an evaluation of whether the perception received in those sources presents a holistic, accurate review of the risk in mental health (i.e., self-reported or clinical confirmation).

Most importantly, it calls for making bold assessments based on "snapshots" of a risk picture that starts with the guidelines as a basis of risk, and then goes beyond them if required. It involves the approach of trying to uniquely offer on cases that demonstrate good functional capacity at home/within society, patterns of good prognosis, well-managed follow-up and consistency of symptom management. It requires exercising efficient decision making with scarce resources; hence, gently reminding risk assessors everything of the underlying notion that the essence of underwriting is truly both an art and a science.

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About the Author

Rochelle Fernandes enjoys working on new initiatives and believes in being an active member of the underwriting community. She is currently an Underwriting Specialist for the Canada Life Assurance Company, as well as having participated in underwriting for the large case team. Her past experience includes two terms over 6 years on the executive committee for the Underwriters Association of Toronto (UAT) and one term for the Canadian Institute of Underwriters (CIU). Prior to underwriting, Rochelle gained experience in naturopathic medicine and clinical research in prostate cancer as a postgraduate student at the Canadian College of Naturopathic Medicine and as a doctoral candidate at the University of Toronto. She previously earned a master's degree in Molecular Immunology and Virology at McMaster University, with a specialty in allergy and asthma. Outside of underwriting, she used to head a research firm known as RD Research Consult that specialized in clinical research and integrative journalism.

WEGOVY, TRULICITY, OZEMPIC... OH MY!

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Executive Summary *Recently, it has become difficult to avoid the buzz of print ads, commercials, social media postings and general discussion about the new weight loss drug Wegovy, a new indication of semaglutide also approved for treatment of Type 2 diabetes under the brand names Ozempic and Rybelsus. Whether it is discussion about drug shortages,[1] side effects or videos showing weight loss results, this class of drugs has been big news in the last year. One analysis from February 2023 estimates there was an increase of over 2000% in prescribing of semaglutide (Ozempic, Rybelsus, Wegovy) and tirzepatide (Mounjaro) for weight management between 2019 and 2022 (tirzepatide was approved in 2022). There was a 259% increase in prescriptions between 2021 and 2022 alone. In this analysis, one-fourth of prescriptions were for individuals without diabetes.[2] Finding a new, effective treatment for obesity has significant public health implications given the prevalence of overweight and obesity and associated comorbidities in the US.*

Obesity in the US

In the US, the prevalence of obesity has been increasing over the last several decades. Approximately 30% of adults are classified as overweight (BMI 25-29.9), 42% as obese (BMI 30-40) and 9% as severely obese (BMI ≥40). Children in the US also have a high prevalence of obesity, with a combined 41% of children being classified as either overweight or obese. Comorbidities associated with obesity affect both morbidity and mortality, and include increased risk for Type 2 diabetes, hypertension, cardiovascular disease, stroke,[3] musculoskeletal conditions, liver disease, gallbladder disease, some cancers and sleep apnea. The aggregate medical costs of obesity in the US was estimated to be over $260 billion in 2016[4] (see Figures 1 and 2, next page).

Glucogen-like Peptide-1 Receptor Agonists (GLP-1 RAs)

The class of drugs getting so much attention for weight loss are GLP-1 receptor agonists (GLP-1 RAs). They are synthetic analogues of GLP-1 that act to control diabetes in four main ways: they stimulate insulin release in response to glucose, reduce hepatic glucose production by inhibiting glucagon release, increase satiety and slow gastric emptying. Unlike natural GLP-1, which is degraded very quickly, the synthetic version tends to stick around longer.[5]

GLP-1 is an incretin hormone produced in the L cells of the small intestine and released upon eating. GLP-1 stimulates glucose-dependent-insulin release from the pancreas islets. GLP-1 receptors are located throughout the GI system in the pancreas, pancreatic ducts and gastric mucosa, and outside the GI system in the kidney, heart, lungs, skin, hypothalamus and immune cells.[6]

Since the first GLP-1 RA medication became available in 2005, several additional medications have been added to this class. They were initially developed as treatments for Type 2 diabetes[7] and have demonstrated significant reductions in A1c in individuals with Type 2, minimal risk of hypoglycemia, and favorable effect on weight. Additionally, dulaglutide, liraglutide and semaglutide (injectable) have shown evidence for reduction in major cardiovascular events. Use of the GLP-1 RAs may be limited by high cost, need for injection of most of the agents, and adverse gastrointestinal (GI) effects in some individuals.[8]

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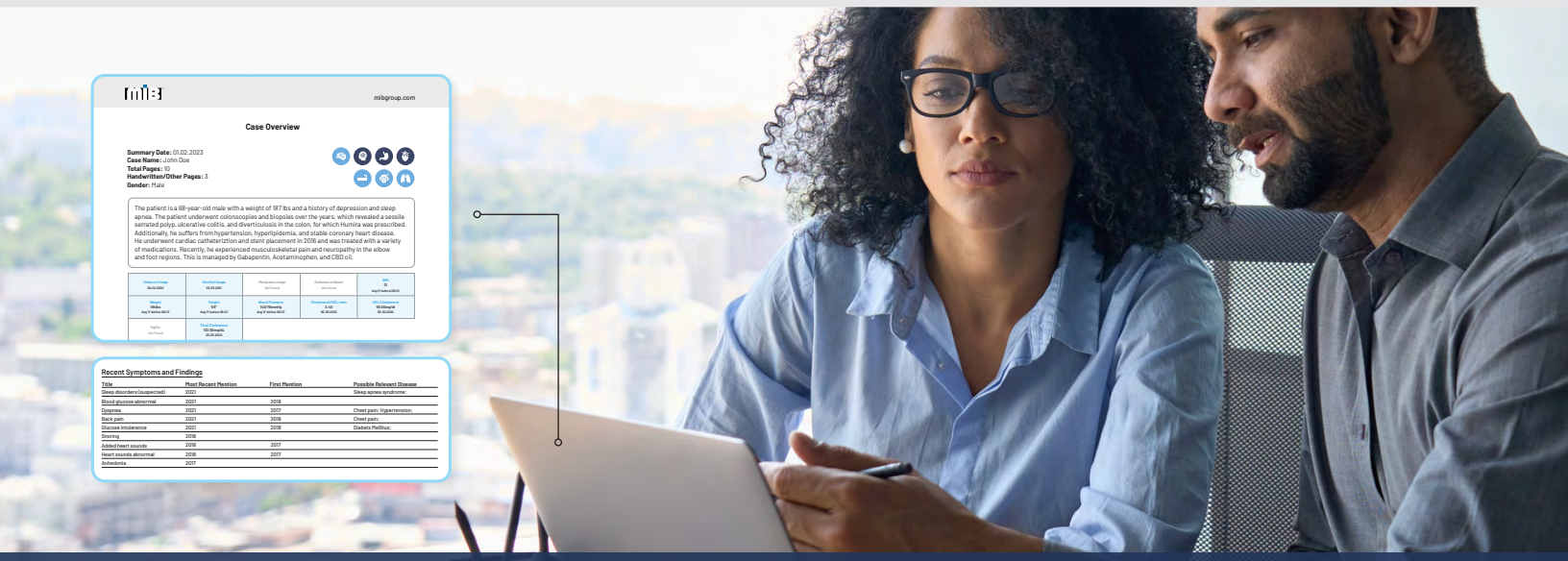

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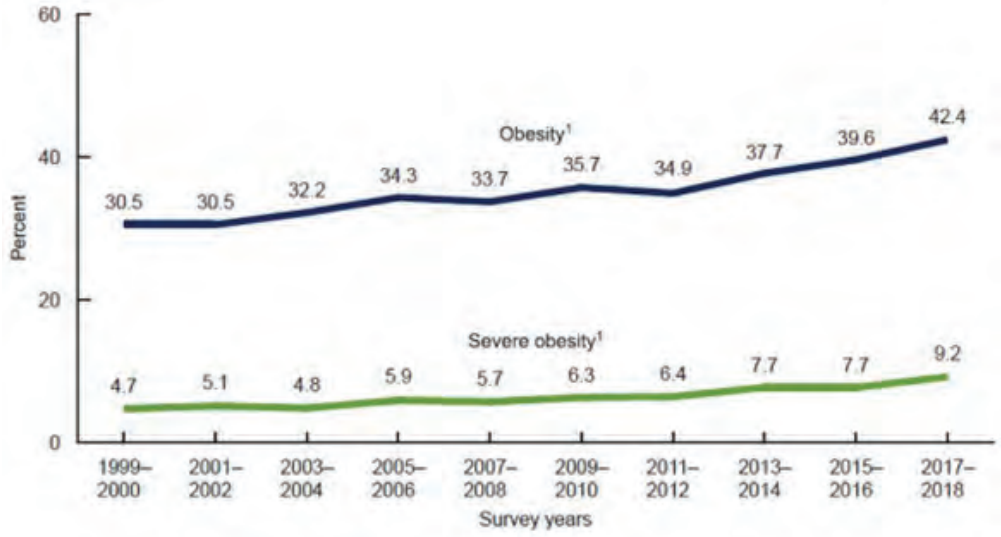
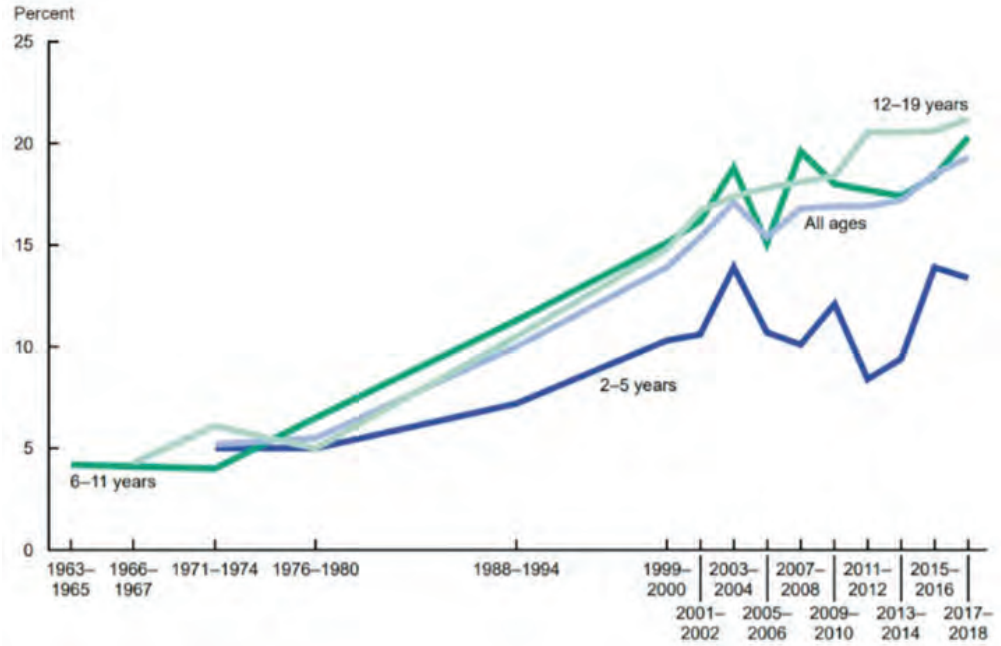
Figure 1. Trends in Age-Adjusted Obesity and Severe Obesity Prevalence Among Adults Ages 20 and Over: US, 1999-2000 Through 2017-2018.



Note: Estimates were age adjusted by the direct method to the 2000 US Census population using the age groups 20-39, 40-59, and 60 and over.
Source: www.niddk.nih.gov/health-information/health-statistics/overweight-obesity.

Figure 2. Trends in Obesity Among Children and Adolescents Ages 2-19 Years, By Age: US, 1963-1965 Through 2017-2018.



Note: Obesity is defined as body mass index (BMI) at or above the 95th percentile from the sex-specific BMI-for-age 2000 CDC Growth Charts.
Source: www.niddk.nih.gov/health-information/health-statistics/overweight-obesity.

Table 1. Summary of GLP-1 RAs available in the US.

Generic Name	Brand Name(s)	Formulation	FDA Approval	Highlights	Contraindications
Semaglutide[9]	Wegovy[10]	2.4 mg weekly injection	Approved 6/2021 for weight management in adults and children age 12+.	Approved for weight loss. Approved in teens.	Personal or family history of medullary thyroid cancer or MEN 2A.
	Ozempic[11]	0.5, 1.0, 2.0 mg weekly injection	Approved 12/2017 to improve blood glucose in adults with Type 2 diabetes and to reduce major CVD events in people with Type 2 and CVD.	Approved for both Type 2 and to reduce major CVD events in Type 2.	
	Rybelsus[12]	7.0, 14.0 mg daily tablet	Approved 9/2019 for blood glucose control in adults with Type 2 diabetes.	First oral GLP-1 drug available in the US.	
Tirzepatide[13]	Mounjaro	2.5, 5, 7.5, 10, 12.5, 15 mg weekly injection	Approved 5/2022 to improve blood glucose control in adults with Type 2 diabetes.	Activates both GLP-1 and GIP.	Personal or family history of medullary thyroid cancer or MEN 2A.
Liraglutide	Victoza[14-16]	1.2, 1.8 mg daily injection	Approved 1/2010 (original approval) for type 2 in adults. Additional approval 8/2017 to reduce CVD events in Type 2. Approved 6/2019 to treat patients 10+ with Type 2 diabetes.	Approved to treat type 2 in kids ages 10 and up. Also approved to reduce CVD events in adults with Type 2 diabetes.	Personal or family history of medullary thyroid cancer or MEN 2A.
	Saxenda[17,18]	3 mg daily injection	Approved 12/2014 for chronic weight management in adults. Approved 12/2020 for kids age ≥12.	Approved for weight loss in kids ages 12-17.	

Dulaglutide	Trulicity[19-21]	.75, 1.5, 3.0, 4.5 mg weekly injection	Approved 9/2014 to improve glycemic control in adults with Type 2 diabetes and to reduce risk of CVD events in adults with Type 2. The 11/2022 approval was extended to kids age 10+ for Type 2 diabetes.	Approved for both Type 2 diabetes and to reduce major CVD events in Type 2 diabetes. Approved for use in kids ages 10 and up for Type 2 diabetes.	Personal or family history of medullary thyroid cancer or MEN 2A.
Exenatide	Byetta[22,23]		Approved 4/2005 as adjunctive therapy for blood sugar control in patients with Type 2 diabetes who have not achieved control with metformin and/or a sulfonylurea. Approved 11/2009 as standalone treatment for Type 2 diabetes. Approved 10/2011 for use with insulin glargine.	This was the first approval in the class. Can be used with insulin.	Personal or family history of medullary thyroid cancer or MEN 2A.
	Bydureon BCise[24,25]	2 mg extended release weekly injection	Approved 1/2012 for adults with Type 2 diabetes (injectable suspension). Pre-filled, single-use pen injector approved 3/2014. Approved 4/2018 as add-on therapy for use with basal insulin in adults with Type 2 diabetes and inadequate glycemic control. Approved 7/21 for ages 10+.	First weekly treatment for Type 2 diabetes. Can be used with insulin. Approved for Type 2 diabetes for kids ages 10+_ as of 7/2021.	

Lixisenatide [26,27]	Adlyxin	na	Approved 7/2016 for adults with Type 2 diabetes. Discontinued 1/2023.	Discontinued 1/1/23 in US market for business reasons. *Soliqua* – a formulation that contains insulin glargine and lixisenatide – is still available.[28]	na

Use for Weight Loss

While the GLP-1 RAs were initially developed to treat Type 2 diabetes, their weight-loss effects are currently getting more attention. All have shown some effect on weight, though their effectiveness varies (see Table 2). So far, only semaglutide (Wegovy) and liraglutide (Saxenda) have FDA approval as therapy for weight loss. Both Wegovy and Saxenda are approved for teens (ages 12 and older) and adults. Wegovy is a weekly injection while Saxenda is a daily injection. In terms of efficacy, the STEP 8 randomized clinical trial compared use of semaglutide 2.4 mg weekly injection with liraglutide 3.0 mg daily injection in overweight and obese adults. After 68 weeks, those in the semaglutide group achieved a mean weight change of -15.8% and those in the liraglutide group a mean weight change of -6.4%. Both led to weight loss, but semaglutide led to greater weight loss.[29] Tirzepatide is not currently FDA-approved for weight loss but has received the FDA Fast Track designation[30] to accelerate the path to approval. In a Phase 3 trial[31] of obese adults receiving tirzepatide weekly for 72 weeks at doses of 5-15 mg, the mean weight change was -15% across groups, with 85% of participants reducing their weight at least 5%. It is important to note that because all the medications in this class have effects on weight, there is evidence that they are being prescribed off-label for weight loss.[32]

What Does This Mean for Underwriting?

Overweight and obesity are very common in the US, and their comorbidities are associated with some of the most common causes of increased morbidity and mortality.[33] While long-term data is lacking for these treatments, reduction in overweight and obesity should theoretically lead to improvement in downstream outcomes. However, this is speculative, and more research is needed over the next decade to study the effectiveness of these therapies over the long term. Currently, in underwriting, it is important to understand that use of this class of medications does not necessarily indicate that a PI is a Type 2 diabetic. It is also important to note that there is a warning about using these medications in individuals at risk for medullary thyroid cancer or MEN 2A. This is a rapidly evolving landscape with many trials underway as drug companies seek indication for weight loss (see tirzepatide), so underwriters will continue to see more of this class of medications with additional changes to come.

Table 2. Comparison of GLP-1 RAs: Effect on Weight Based on Phase III Studies

Drug	*Effect on Weight Compared to Other GLP-1 RAs*
Dulaglutide (Trulicity)	Intermediate
Exenatide Twice daily (Byetta) XR (Bydureon BCise)	 Low Low
Liraglutide (Saxenda, Victoza)	High
Lixisenatide (Adlyxin) #	Low
Semaglutide Oral (Rybelsus) Injection (Ozempic, Wegovy)	 Highest Highest

Note: Analyses for this table did not include tirzepatide. #Discontinued in US Market in 2023.[26]
Source: Trujillo et al. 2021.[32]

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RESHAPING THE FUTURE OF CANCER DETECTION

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Munich Re

Executive Summary *Cancer continues to be a leading cause of death in the US and throughout the world. Eating healthy, exercising and making positive lifestyle choices are a few ways you can reduce the risk of cancer, but what if all of that isn't enough? Multi-cancer early detection tests are an effective method that is reshaping the future of cancer, both clinically and in life insurance. Earlier detection of cancer through the use of these tests could lead to mortality reductions and boost sales of life insurance policies.*

Introduction

Across the life insurance industry, companies mission statements and mottos focus on people. State Farm helps insureds "recover from the unexpected."[1] Nationwide is "on your side" by "protecting people, businesses and futures with extraordinary care," while John Hancock wants to "make lives better."[2,3]

Additional insured, children's term, waiver of premium and chronic illness riders are well-known benefits that enhance insurance protection, but disruption in the industry is occurring. Now, multi-cancer early detection (MCED) blood testing will bring insurance protection to an entirely new level.

Why a Blood Test? Answer: CANCER

Cancer is a disease caused by growth and potential spread of abnormal cells that occur during the fundamental process of life called mitosis. Damage can occur to DNA within cells during cell division and growth. Changes to the cells inhibit the ability of tumor suppressor genes to prevent cancer growth. These abnormal cells can happen randomly, have a genetic component, or occur because of external risk factors.[4]

Cancer continues to be the second leading cause of death in the US. In 2021, over 600,000 individuals lost their lives to cancer, second only to heart disease.[5] Whether being evaluated for, diagnosed with, unaware that one may currently have cancer, or having a loved one fighting cancer, it is estimated over 8.9 million people are affected by this disease.[6] Given these numbers, cancer can be scary.

Cancer Doesn't NEED To Be Scary

While millions of people are affected by cancer, overall cancer death rates are declining. Cancer death rates decreased 2.3% per year among males and 1.9% per year among females.[7] Changes in death rates for specific cancers can be seen in Figure 1 (next page).

Death rates are declining due to:

- Advances in cancer research, especially the development of mutation-targeted and immunotherapy treatments.
- Proven success with cancer vaccines, such as the HPV vaccine.
- New imaging modalities that enable earlier detection of lung cancer and refined use of colonoscopies for early-stage colon cancer diagnosis.
- Public health and awareness campaigns directed at lifestyle choices, especially cigarette smoking.[8]

"Together We Can" is just one example of a cancer-fighting campaign created by the American Institute for Cancer Research (AICR). AIRC provides many public resources including a downloadable 30-day cancer prevention checklist. This document educates the public that nearly half of all cancers can be prevented by having healthier habits.[9]

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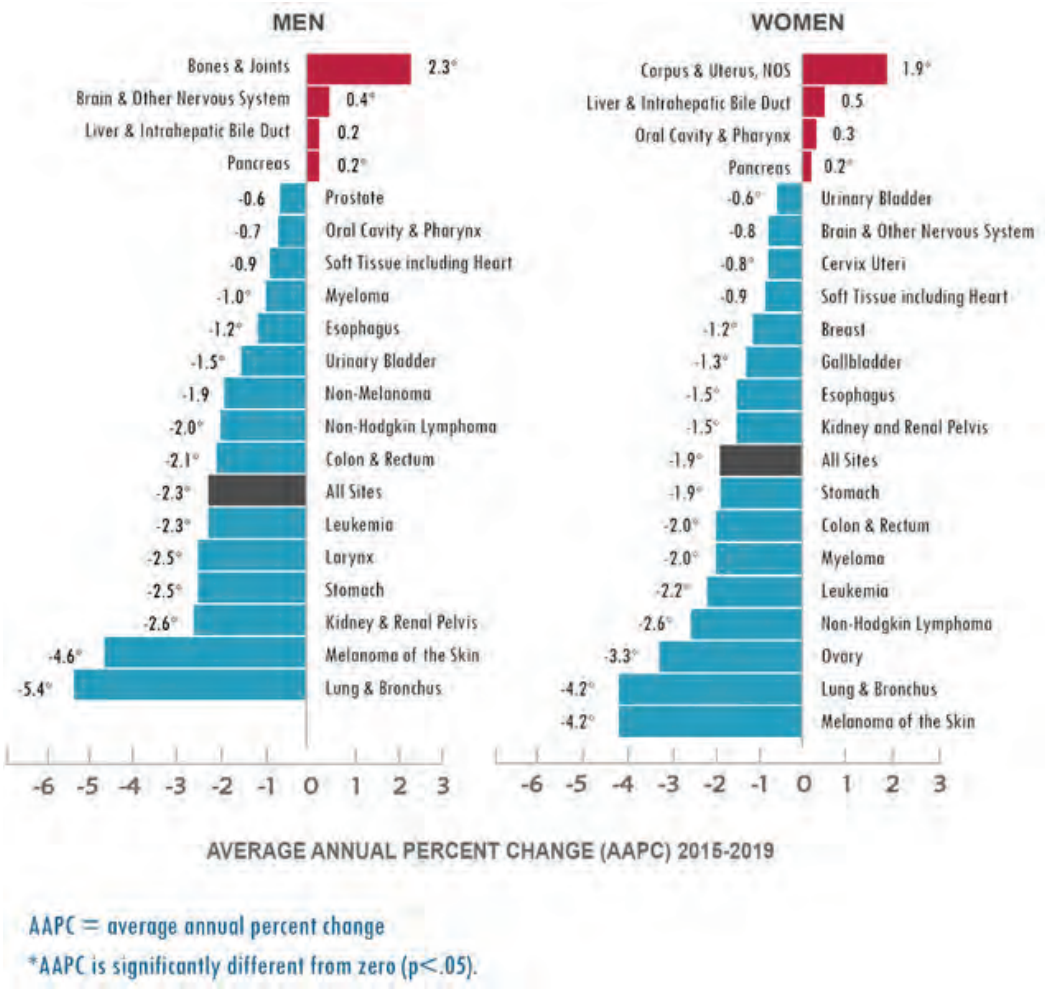
* Source: NMG Consulting Global AUS (Automated Underwriting Systems) studies 2019-2021

Figure 1. National Trends in Cancer Death Rates According to SEER.[10]



Source: Seer.cancer.gov. Annual report to the nation.

Figure 2. Cigarette Smoking Rate.[11]

Source: Centers for Disease Control and Prevention. Published Aug. 30, 2018.

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As seen in Figure 2, cigarette smoking has steadily declined. According to the Centers for Disease Control and Prevention, smoking rates in 2021 are even lower at 11.5%.[12] Since 90% of lung cancers are caused by cigarette smoking, reduction in smoking rates has significantly contributed to the reduction in incidence of lung cancer.[13]

Ms. Lilly, a Case Study

Ms. Lilly is a 50-year-old female who maintains a normal body weight, remains active by completing the daily recommended amounts of activity, does not smoke and is a rare social drinker. At the time of her annual check-up, she was found to have elevated liver function test results. She was advised to change her drinking habits and follow up in 6 months with new lab work.

Follow-up blood tests occurred periodically over the next 2 years; her physician indicated the elevations were likely due to stress or other medications she was taking. Ms. Lilly eventually developed abdominal pain and was evaluated with imaging, which showed ovarian cysts. Due to family history of cancer in her father, mother and sibling, she was tested for the BRCA gene.

Although her results were negative, her medical team advised a hysterectomy to avoid any possible cancer. Even after the hysterectomy, she continued to feel ill. Her gallbladder was removed, and she had negative stress testing for chest pain, where all cardiac concerns were ruled out.

Three years, multiple tests and medical procedures later, a spot on her liver was identified by a radiologist after severe abdominal pain prompted an emergency room visit. Unfortunately, Ms. Lilly was diagnosed with Stage 3 hepatocellular carcinoma.

Questions for Underwriters:

- What were her risk factors?
- Did Ms. Lilly follow the physician's recommendations?
- What could Ms. Lilly or her medical team have done differently?
- Should she have sought a second opinion?

Enter Multi-Cancer Early Detection Tests

Multi-cancer early detection tests (MCED) are a form of liquid biopsy. Using a non-invasive blood sample, an individual can be tested for the presence of multiple cancers. Positive MCED results mean that a cancer signal from damaged DNA was found in the specimen. MCED testing is aimed at finding cancer at earlier stages when it is most treatable, especially in individuals who are symptom-free.[14] Since about 70% of cancer deaths are due to cancers that are difficult to detect or have no recommended screening guidelines, use of MCED tests is vital to reducing overall cancer mortality.[15]

Many companies are involved in the development of MCED tests, as shown in Figure 3 (next page), although none of these tests are FDA-approved at this time. However, some MCED tests, like Grail's Galleri, are approved for use by the US Federal Government's Clinical Laboratory Improvement Amendments Program (CLIA). As part of CLIA acceptance, MCED tests can be completed if ordered by a doctor. MCED tests are to be used in conjunction with recommended screening tests such as pap smears, mammograms and colonoscopies. They are not considered a replacement for screening tests.[15]

Galleri by Grail

One of the prominent MCED tests developed is Galleri. Researchers at Grail found DNA abnormalities in blood specimens and, upon further investigation, linked these changes to cancer.

- Galleri is a new blood test that can detect more than 50 types of cancer through a single blood draw.
- Forty-five of those cancer types do not currently have any recommended screening.
- Experts say Galleri will revolutionize cancer screening, potentially leading to reductions in the human and economic toll of cancer.[16]

This testing is significantly increasing chances for early cancer detection, leading to better long-term outcomes and even the possibility of cure.[16] This MCED test is for individuals at an elevated risk for cancer. Testing currently applies to people ages 50 and up, or those with elevated risk factors.[17]

Examples of elevated risk factors include:

- Smoking
- High body mass index (BMI)
- Prior personal history of cancer
- Familial history of cancer[18]

Case Study Wrap-Up

Remember Ms. Lilly? Even though she was up-to-date on her medical screenings, not a smoker and was physically active, she was at risk for cancer. Given her age, she would qualify for an MCED test like the Galleri testing. With positive results, she may have been diagnosed with liver cancer prior to it progressing to Stage 3. Her medical team could have avoided unnecessary medical procedures and saved Ms. Lilly money and years of suffering.

Figure 3. List of MCED Tests and Their Targeted Cancers.[19]

Company	Assay	Technology	Targeted Cancers															
			Lung	CRC	Breast	Pancreas	Liver	Esophagus	Stomach	Ovary	Prostate	Bladder	Kidney	Uterus	H&N	Lymphoma	Leukemia	Plasma Cell
Adela Bio	adela	cfMeDIP-seq; cfDNA fragmentomics	■	■	■	■						■	■				■	
Biological Dynamics	Tr(ACE)	EV proteins; AI				■				■		■						
Bluestar Genomics	BluestarMCD	cfDNA 5hmC-seq; fragmentomics	■	■	■	■	■	■	■	■								
Burning Rock	OverC™	ELSA-seq	■	■		■	■	■		■								
Caris Life Sci	MI	cfDNA/cfRNA NGS; AI	■	■	■				■				■	■				
Delfi Dignostics	DELFI	cfDNA fragmentomics	■	■		■			■	■								
Early Diagnostics	cf Methyl-Seq	cfDNA mC-NGS	■	■			■		■									
Exact Sciences	CancerSEEK	cfDNA NGS; protein markers	■	■	■	■	■	■	■	■								
Freenome	FMBT	Multi-Omics/AI	■	■	■	■	■	■	■	■	■	■	■	■				
Grail	Galleri	CpG-cfDNA NGS	■	■		■	■	■	■	■		■			■	■		■
LungLifeAI	LungLB	CTC FISH; Imaging AI	■		■		■						■					
Natera	Signatera™	cfDNA NGS; protein markers	■	■	■	■	■					■		■				
Precision Epigenomics	Sentinel-10™	CpG-cfDNA qPCR	■	■	■	■	■											
20/20 Gene Systems	one TEST	circul. Cancer Ag's; AI	■	■	■	■	■				■							

Source: National Cancer Institute.

MCED and Life Insurance

The benefits of MCED testing are priceless, especially for the high-risk individual: a person of older age, smoker or with a significant family history. A negative MCED test in conjunction with regular age-related, routine screening can provide peace of mind. Avoiding unnecessary treatment and testing for symptoms with no known etiology can reduce a person's expenses, wasted time and effort.

This is a crucial benefit that insurers should offer for a variety of reasons, such as:

- This benefit can boost new business growth as distributors are excited to see MCED testing available in the market.
- MCED tests could reduce in-force mortality by detecting cancer earlier, since cancer is the No. 1 factor affecting long-term mortality.
- Offering MCED tests like Galleri to certain policyholders could provide a positive investment for an insurer because the mortality savings could be greater than the cost of the test.
- Providing this customized benefit strengthens customer engagement leading to increased persistency rates.[20]

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About the Author

Melissa Butcher, FALU, CLU, FLMI, AFSI, ACS, started her life insurance career in 2000 and has over 20 years of underwriting experience. Her experience includes new business application processing to underwriting decisioning to policy change processing. Using all this experience, she has been involved in many innovative underwriting projects to enhance the life insurance experience, not only for applicants and financial advisors, but for her underwriting peers. Currently, as a Risk Underwriting Specialist for Munich Re, she is working on enhancing automated underwriting practices and usage with Munich RE's automated underwriting platform named Alitheia. Her goal is to expand insurability, increase automation, and learn and grow with her underwriting peers.

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COFFEE CONSUMPTION – HOW MUCH IS TOO MUCH? AND HOW LITTLE IS NOT ENOUGH?

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Executive Summary *While millions of people worldwide start their day with a cup of coffee to get that caffeine "hit," they may not realize that they are also promoting long-term health and longevity. RGA's Hilary Henly explores the benefits of daily coffee consumption and the implications for insurers.*

While millions of people worldwide start their day with a cup of coffee to get that caffeine "hit," they may not realize that they are also promoting long-term health and longevity, which is good news for insurers! Globally, an estimated 2.25 billion cups of coffee are consumed every day.[1] Roughly 80% of Americans drink coffee, with 60% of the total population drinking coffee daily.[2]

Research suggests coffee consumption may be one habit worth keeping. It has been associated with a reduced risk of all-cause mortality and cause-specific mortality from Type 2 diabetes, Parkinson's disease, liver disease, cardiovascular disease (CVD), and colorectal, liver and renal cancers.[3] Cancer and heart disease account for the largest percentage of causes of death in the US at 37% and 20%, respectively,[2] so perhaps now is the time to get in that extra morning sip!

Coffee Compounds

When people think about needing a cup of coffee, they often think about the need for caffeine, a natural stimulant known to combat fatigue and increase energy levels, but the benefits of coffee go far beyond the intake of caffeine. Coffee also contains over 1000 bioactive compounds, for example, diterpenes such as cafestol and kahweol, potassium, niacin (vitamin B3), polyphenols such as chlorogenic acids (CGAs), and tocopherols (a form of vitamin E), many of which have antioxidant, anti-inflammatory and antifibrotic properties. Coffee is a major source of caffeine, which stimulates the central nervous system, leading to increased activity and physical exercise, one of the key factors in improved health and longevity.[4]

Coffee also contains other compounds such as trigonelline, melanoidins and magnesium, which are known to have antioxidant properties.[5] Trigonelline and magnesium can improve insulin sensitivity and glucose resistance.[6] The levels of compounds in a cup of coffee vary by the type of coffee bean used, the roasting process, the brewing technique and the size of the serving. For example, cafestol and kahweol are removed via filtration and therefore have a lower presence in filtered and instant coffee.[7]

Effects of Compounds on Human Health

Different compounds in coffee influence biological activity in humans, such as the microbiome composition, fecal output, inflammation, secretion of bile acids and insulin sensitivity.[7] Coffee may produce anticarcinogenic effects, including inhibition of the enzyme responsible for carcinogen activation.[6]

In 1991, the International Agency for Research on Cancer (IARC) classified coffee as "possibly carcinogenic to humans," but in 2016, following a review of over a thousand studies, it found that there was insufficient evidence to support this finding and it is now not classified as carcinogenic. In 2015 the US Dietary Guidelines Advisory Committee concluded that up to five 8-ounce cups/day can be part of a healthy diet.[8] For healthy adults, the Food and Drug Administration (FDA) has cited 400 milligrams per day of caffeine as

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an amount not generally associated with dangerous or negative effects.[9]

Coffee intake is associated with short-term elevations in arterial pressure, insulin resistance and low-density lipoprotein (LDL) rise, but is not related to hypertension with long-term intake as it induces tolerance to its acute and short-term pressure effect.[10] Caffeine is associated with a higher risk of some cardiovascular diseases, but is also understood to have antioxidant capacity and limit the growth of human colon cancer cells.[7] More than 95% of caffeine is metabolized by the enzyme cytochrome P450 1A2, but a polymorphism in the CYP1A2 gene affects caffeine metabolism. People with AC and CC genotypes are slow metabolizers, while AA genotypes are fast metabolizers.[11]

Coffee consumption can help prevent gallstone formation, improve lipid metabolism regulation, decrease liver enzymes and rates of liver steatosis, and reduce the risk of liver inflammation, fibrosis and liver disease progression.[12] It has been found to lower the risk of CVD by reducing inflammation and lowering blood sugar.[13]

All-Cause and Cause-Specific Mortality

Using data from the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort, researchers found that consumption of 3+ cups/day of coffee was associated with lower all-cause mortality in men (hazard ratio (HR) 0.88) and in women (HR 0.93) compared with no coffee consumption. For cause-specific mortality, a lower risk of death from digestive and circulatory disease was noted. Coffee drinkers were found to have more favorable liver function and inflammatory biomarker profiles than non or low consumers of coffee. Serum levels of liver function enzymes, including alanine aminotransferase (ALT), alkaline phosphatase (ALP), aspartate aminotransferase (AST) and gamma-glutamyl transferase (GGT), were also lower among coffee drinkers than non or low consumers of coffee.[1]

Table 1. Associations of Coffee Consumption (HR*) and All-Cause and Cause-Specific Mortality in Men[1]

Variable	<1 cup/day	1-< 2 cups/day	2- <3 cups day	3+ cups/day
All-cause	0.94	0.88	0.84	0.88
Cancer	0.92	0.97	0.92	0.99
Circulatory disease	1.02	0.93	0.87	0.93
CVD	0.94	0.83	0.76	0.83
IHD	1.03	0.96	0.92	0.97
Digestive disease	1.00	0.69	0.46	0.41
Respiratory disease	1.00	0.81	0.84	1.05

**Hazard ratio compares the result of those exposed to those not exposed.*

Table 2. Associations of Coffee Consumption (HR) and All-Cause and Cause-Specific Mortality in Women[1]

Variable	<1 cup/day	1-< 2 cups/day	2- <3 cups day	3+ cups/day
All-cause	0.94	0.90	0.90	0.93
Cancer	1.00	1.05	1.04	1.12
Circulatory disease	0.89	0.74	0.77	0.78
CVD	0.85	0.77	0.74	0.70
IHD	1.03	0.83	0.74	0.82
Digestive disease	1.00	0.70	0.67	0.60
Respiratory disease	1.00	0.95	0.83	0.91

Table 3. Daily Coffee Consumption (HR) With All-Cause Mortality and Cause-Specific Mortality[2]

Mortality variable	<1 cup/day	1 cup/day	2-3 cups day	4-5 cups/day
All-cause	0.99	0.94	0.82	0.79
Heart disease	1.00	0.81	0.74	0.75
Cancer	0.93	1.05	0.95	0.95
CLRD	0.93	0.73	0.78	0.68
Stroke	0.89	0.88	0.68	0.77
Alzheimer's disease	1.01	0.66	0.59	0.72
Diabetes	1.90	1.38	0.79	0.88

Using data from the Prostate, Lung Colorectal and Ovarian (PLCO) Cancer Screening Trial Cohort, researchers looked at the association of coffee consumption with overall and cause-specific mortality. Among 90,317 US adults, coffee drinkers vs. nondrinkers had a lower risk for overall mortality, with inverse associations observed for deaths from heart disease, cancer, chronic lower respiratory diseases (CLRD), stroke, Alzheimer's disease and Type 2 diabetes.[2]

Coffee Consumption and Cancer

Coffee consumption has been shown to reduce the risk of multiple cancers due to its antioxidants and anticarcinogenic compounds. Research suggests that caffeine and diterpenes such as cafestol and kahweol exert anticarcinogenic effects, while phenolic compounds in coffee such as CGA exert antioxidant and anti-inflammatory effects.[12]

A meta-analysis of 59 studies that looked at the association between coffee consumption and cancer found that an increase in consumption of 1 cup/day was associated with a 3% reduction in the relative risk (RR) of cancer (RR 0.97). Coffee consumption was inversely associated with bladder (RR 0.83), breast (RR 0.94), buccal and pharyngeal (RR 0.49), colorectal (RR 0.89), endometrial (RR 0.74), esophageal (RR 0.55), hepatocellular (RR 0.54), leukemia (RR 0.64), pancreatic (RR 0.82) and prostate (RR 0.79) cancer.[3]

A study using data from the UK Biobank showed a marked inverse association between hepatocellular carcinoma and coffee consumption (HR 0.50), which was similar for instant (HR 0.51) and ground coffee (HR 0.47). The risk of pancreatic cancer was reduced by 34% in people who consumed decaffeinated coffee compared to those who did not drink any coffee. While the risk of gallbladder and extrahepatic bile duct carcinoma was increased with any coffee consumption, it was most significant in people who consumed decaffeinated coffee (HR 2.44).[14]

A separate study, again using data from the UK Biobank, showed that coffee consumption was associated with an increased risk of digestive system cancer (odds ratio*** (OR) 1.28) and multiple myeloma (OR 2.25). There was also an increased risk of esophageal cancer, potentially resulting from gastroesophageal reflux, which is known to occur with coffee intake, which promotes esophageal inflammation, a precursor to cancer.[15] ****Odds ratio refers to the measure of association in coffee drinkers compared to non-coffee drinkers.*

Other research has shown a reduced risk of renal and liver cancers. In 2018, renal cancer accounted for approximately 2.4% of all worldwide cancer cases, with incidence continuing to rise in many parts of the world. A study on coffee consumption and renal cancer showed that there was a relative risk of 0.88 with the highest (>4 cups/day) compared to lower coffee consumption (<1 cup/day or <2 cups/day). It was estimated that one additional cup of coffee per day was associated with a 3% decrease in the risk of renal cancer.[16]

Incidence of hepatocellular carcinoma (HCC) in the US has tripled in the last 3 decades, and the 5-year survival rate is currently less than 12%. Individuals who drank 2-3 cups/day of coffee were found to have a 38% reduced risk of HCC, while those who drank >4 cups/day had a 41% reduced risk of HCC compared to non-coffee drinkers. Individuals who drank 2-3 cups/day had a 46% reduced risk of chronic liver disease (CLD) mortality while those who drank >4 cups/day had a 71% reduced risk compared to non-coffee drinkers. Increasing coffee intake, particularly by >2 cups/day was associated with a reduced incidence of HCC (33%) and reduced CLD mortality (46%).[17]

Table 4. Caffeinated Coffee Consumption Intake (RR) With HCC Incidence and CLD Mortality (Ref=0 cups)[17]**

Variable	1 cup/day	2-3 cups/day	≥ 4 cups/day
HCC	0.97	0.73	0.81
CLD	0.99	0.64	0.40

***Relative risk refers to the probability of the disease in coffee drinkers compared to non-coffee drinkers.*

Conclusions

Different compounds in coffee play a beneficial role in human health for all-cause and cause-specific mortality from conditions such as diabetes, CVD, some cancers and neurological diseases. Daily coffee consumption, particularly at higher levels, has been shown to improve mortality, protect against diseases and slow the progression of inflammation. While further research is required to provide greater clarity on the association between coffee consumption and mortality, drinking several cups of coffee a day has many benefits, including antioxidant, anti-inflammatory and anticarcinogenic effects. This in turn leads to lower rates of chronic disease, impacting many aspects of insurance, including pricing, product development, and the number of health claims made to insurers.

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The Association of Home Office Underwriters and Canadian Institute of Underwriters endorse these Guiding Principles so as to:

- Make all of our members aware of the responsibilities of those who, directly or indirectly, practice or engage in the process of underwriting

- Clarify for consumers, legislators and regulators that the underwriting process includes principles which extend beyond any single individual's and/or company's self interest.

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3. Treat all underwriting information with the utmost confidentiality and use it only for the express purpose of evaluating and classifying the risk.

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6. Act responsibly as an employee with scrupulous attention to the mutual trust required in an employer/employee relationship.

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9. Maintain the dignity and sound reputation of the Underwriting Profession.

10. Increase the public's understanding of underwriting by providing information about risk classification.

EXERCISE TESTS TO DETECT THE PRESENCE OF CORONARY ARTERY DISEASE ARE NOT EQUAL IN PREDICTING MORTALITY RISK

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Executive Summary *Not all medical diagnostic tests are equal in their ability to rule in or out disease. Tests for coronary artery disease (CAD) are no exception, with exercise tests for ischemia having different degrees of diagnostic accuracy. How does the underwriter determine which tests which have the best evidence-based, underwriting mortality outcome, and justify the use of different debits and credits for the results? This article will discuss three tests used to detect the presence of CAD: the treadmill, nuclear and echocardiogram stress tests.*

The key to the predictive underwriting value of a test is its sensitivity and specificity Table 1.

Table 1.

Disease:	Sick	Healthy	
Positive	True positive (TP)	False positive (FP)	→ PPV
Test result: Negative	False negative (FN)	True negative (TN)	→ NPV
	↓ Sensitivity	↓ Specificity	

Sensitivity (SN). Identifies the true positive rate: those with a positive test who have disease. The better the sensitivity of a test, the more likely a positive result will detect an impairment.

Specificity (SP). Identifies the true negative rate: those with a negative test who do not have disease. The better the specificity of a test, the more likely a negative result will indicate the absence of an impairment.

The gold standard for detection of CAD is the angiogram. Its sensitivity and specificity approach 100%. These high numbers mean that, if the angiogram is either positive or negative, the clinically significant presence of CAD is absent or present. The angiogram is usually the final diagnostic test, if needed, to diagnose CAD. Based on the history of chest pain or other symptoms, the attending physician will usually begin with a treadmill stress test, then depending on the result, order either a nuclear or echo stress test or go directly to the angiogram.

Table 2. Underwriting Outcomes for Stress Tests

	Treadmill	Nuclear	Echo
True Positive	68	83	88
True Negative	77	77	83
False Positive	23	23	17
False Negative	32	17	12

Shown in Table 2, the stress echocardiogram is the most accurate of the three exercise cardiac diagnostic tests having a SN, (true positive rate) of 88% and a SP (true negative rate) of 83%.[1] This test, when positive, correctly identifies 88% of those with CAD. However, 12% of the those with CAD will have a negative test result, a false negative, missing those with CAD. Conversely, 83% of individuals without CAD will test

negative, true negatives, but 17% will have a false positive test, those without CAD. The accuracy of the stress echo is followed by the nuclear stress test with a SN of 83% and a SP of 77%.[2] The least accurate is the standard treadmill exercise test with a SN of 68% and a SP of 77%. This latter test will identify only 68% of true positives, while yielding 23% false positives and 32% false negatives.[3]

What do these numbers mean when underwriting a case of suspected CAD and the need to assess either debits or credits depending on the test result? As noted earlier, the higher the SN, the more likely a positive test indicates the presence of CAD and the need to add debits. Conversely, the higher the SP, the more likely a negative test will rule out the presence of CAD and the appropriateness to credit the history. Looking at the SN and SP, based on their accuracy to rule in or out CAD, it is appropriate to assess more debits to the results of a positive stress echo than an exercise stress test, the former with 20% more true positives. The nuclear stress test is in between. Using the same logic, it would be more appropriate to give a higher credit for a negative echo stress test result than for a negative exercise stress test, with 6% more true negatives.

As we strive to improve our underwriting accuracy, it would be appropriate to have our medical impairment manuals base their debits and credits on current evidence-based medicine. Those manuals which are up-to-date and evidence-based will produce the most competitive offers. Unfortunately, medical impairment manuals cannot offer an extensive menu of credits and debits based on the SN and SP of each test. To do so would create a cumbersome, time-consuming manual of underwriting directions. However, the underwriter, having knowledge of the diagnostic accuracy of various cardiac diagnostic tests, can make more competitive underwriting decisions by applying debits and credits based on knowledge of the sensitivity and specificity of the test. If you deviate from the manual, which is only a guideline, document the reason for your decision in the underwriting notes.

One way the underwriter can compensate for false positive and false negative test results is by understanding the entire case and its accompanying medical history. What if an older applicant with cardiac risk factors presents with highly suspicious chest pain and tests negative for ischemia on a stress test? Which do you put the most emphasis on, the risk factors and history of chest pain or the negative test result? Recalling all diagnostic stress tests have false negatives, especially the standard stress test, I would consider the negative stress test a false negative and offer little or no credit.

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About the Author

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WEDNESDAY

11:00 AM	Registration
11:45 AM	Networking luncheon provided by TWUC
1:00 PM	*Welcome speech & announcements* Jill Thompson, TWUC President
1:15 PM	*Risky Business: analyzing risks using a more qualitative approach* Mike Hesse, Mass Mutual
2:15 PM	Break, Announcements & Giveaways
2:30 PM	*History of Underwriting* Carolyn McAvinn, MIB & Doreen Acampora, Milliman
3:30 PM	Break, Announcements & Giveaways
3:45 PM	*Underwriting Marijuana: The Good, The Bad & The Totally Rad* John White, MD, MBA, Munich Re
5:15 PM	Cocktail Networking Reception Dinner on your own

THURSDAY

8:30 AM	Welcome & Announcements
8:45 AM	*Think Critically AND STRENGTHEN YOUR DECISION PROFICIENCY* Jill Thompson, Optimum Re & Cynthia French-Poteet, American National
9:45 AM	Break, Announcements & Giveaways
10:00 AM	*Case Clinic: Head & Neck Cancers: HPV Gone Viral!* Preeti Dalawari, MD, RGA & Michelle Privett, MS, RN, RGA
11:00 AM	Lunch on your own
1:00 PM	Announcements
1:15 PM	*Pulmonary Potpourri* Minas Joannides, MD, Optimum Re
2:15 PM	Break, Announcements & Giveaways
2:30 PM	*The ABCs of Viral Hepatitis* Michael Wetzel, MD, Equitable
3:30 PM	Break, Announcements & Giveaways
3:45 PM	Doctor Panel Dr. Preeti Dalawari, Dr. Minas Joannides, Dr. Michael Wetzel, Dr. John White
5:00 PM	Dinner on your own
7:00 PM	Evening Event: Kirby Ice House

FRIDAY

8:00 AM	Business Meeting - All are welcome!

thank you for attending!

AVIAN INFLUENZA VIRUS – ANOTHER CRISIS IN THE MAKING?

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It is 60 years since the iconic Alfred Hitchcock movie *The Birds* was released, based on the true events of a mass bird attack in California. Today, the avian influenza A virus has created its own drama.

Reports of human infections have been sporadic, but the circulation of the highly pathogenic avian influenza (HPAI) virus has been rising in avian species, leading to the mass culling of poultry and mammals such as red foxes, seals and minks.

Thankfully, human avian influenza infection rates remain low and are mainly confined to those who have been in direct contact with sick or dead birds that harbor the disease. The concern is not the number of reported human infections, but the potential for the avian influenza virus (AIV) to further mutate, allowing for human-to-human transmission and the start of another pandemic.

What Is Avian Influenza Virus (AIV)?

There are four types of influenza virus; A, B, C and D. AIV, nicknamed "bird flu," is a highly contagious type A virus that spreads between wild aquatic birds, causing severe respiratory disease. Once confined to Asia, type A has appeared in Africa, Europe and North America, and has recently spread southwards from Mexico to southern Chile. Mammals that feed on wild birds are also being infected, which resulted in a mass mortality event of 3,487 South American sea lions in Peru in early 2023.[1]

Subtypes

AIV has many subtypes based on two proteins, hemagglutinin (HA) and neuraminidase (NA). For example, the H5N1 virus has a HA 5 protein and a NA 1 protein.[2] Viral modification can occur by antigen drift, where small mutations arise due to the influence of the host, or by antigen shift, where genetic reassortment occurs to create new HA or NA subtypes, leaving a human host without any immunological defense against the new strain of the virus due to lack of previous exposure.[3]

H5N1, H5N6, H5N8, H6N1, H7N2, H7N3, H7N7, H7N9, H9N2, H10N7 and H10N8 are all known to infect humans. While mild symptoms are associated with H6N1, H7N2, H7N3 and H7N7 subtypes, H5N1 and H7N9 can cause severe symptoms in humans, leading to a high mortality rate.[3] The viral strains that originate from animal hosts with new HA or NA subtypes are most likely to impact pandemic risk. These novel strains can spread quickly through the human population due to a lack of immunity.[4]

The current clade (the original virus and its descendants) of the H5N1 virus is known as 2.3.4.4b. Cases of H5N1 2.3.4.4b have been reported from Chile, China, England, Ecuador, Spain and the US, with one reported fatality in China.[5] The most recent AIV H5 infection was identified in two poultry workers in England in May 2023. Importantly, no human-to-human transmission has been reported in any of these cases.[6]

H7N9 is a potential pandemic AIV as it is widespread in poultry markets, can overcome host barriers, pre-existing neutralizing antibodies are absent, has a gene reassortment with H9N2, and adapts to a human host. H5N1 and H7N9 are of greatest concern due to their high mortality rates.[7] The US Centers for Disease Control and Prevention (CDC) currently places the pandemic risk of H5N1 clade 2.3.4.4b virus as moderate, and H7N9 as moderate-high.[8]

Symptoms and Treatments

Human disease can occur after contact with infected bird droppings, saliva, or contaminated food and water; hence, poultry workers are at higher risk of

infection than the general population. The onset of symptoms after initial infection usually appears after 3 to 5 days. For H5N1 infection, human incubation is between 2 and 5 days but can be as long as 17 days.[3] Symptoms of avian influenza include headache, sore muscles, cough or shortness of breath, and an extremely high temperature. Other symptoms may include diarrhea, nausea, chest pain, conjunctivitis and nasal hemorrhage.[7] In severe cases, it can lead to encephalitis, pneumonia, multi-organ failure and acute respiratory distress syndrome (ARDS), as the lungs of those infected experience diffuse alveolar destruction and bleeding. High viral loads, lymphopenia and elevated levels of cytokines have all been associated with fatal outcomes in H5N1-infected individuals.[3]

Treatments include antiviral medication such as Tamiflu (oseltamivir), Rabivab (peramivir) and Relenza (zanamivir), which are aimed at reducing the severity of symptoms, preventing complications and improving the chances of survival. All drugs are NA inhibitors and are most effective when taken early in infections. However, the best defense against the influenza virus remains vaccination.[7]

History of Human Avian Influenza Infection

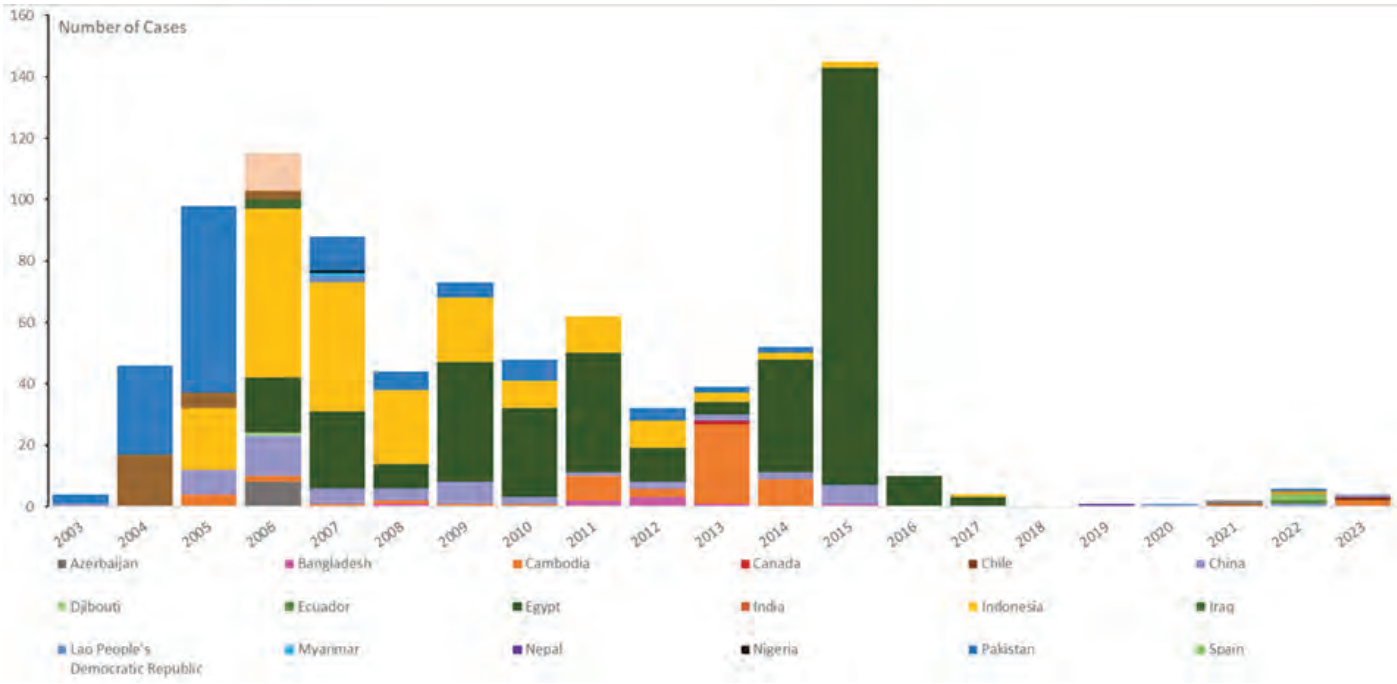
In 1918, the subtype H1N1 caused the Spanish Flu pandemic, resulting in millions of deaths worldwide. This was followed by the Asian Flu pandemic in 1957 (H2N2), the China Flu pandemic in 1968 (H3N2), and the H1N1 "swine flu" global pandemic in 2009.[3] H5N1 is currently the most problematic strain of the flu virus. First identified in 1959, it remained undetected until 1996 when the virus was found in geese in southern China and Hong Kong. In 1997, 18 people became infected with H5N1 resulting in six deaths; the virus did not reemerge again in humans until 2003.[9] The highly pathogenic strain H7N9 was first identified in humans in China in 2013, and the country experienced several waves of infection up to 2017. Cases identified outside of China were found to be in people who had traveled from the country.[4]

Infection and Mortality Rates

During the severe pandemic of 1918, over 500 million people (about one-third of the world's population at the time) became infected with H1N1, and between 50 and 100 million people were reported to have died. The 1968 H3N2 pandemic was reported to have killed 0.03% of the world's population, but by the 2009 H1N1 pandemic, just 0.001% to 0.007% of the global population died during the first 12 months. Still, this accounted for an estimated 700 million to 1.4 billion human infections and 151,700–575,400 deaths, a mortality rate between 0.02% and 0.04%.[3,10]

AIV subtypes H5N1 and H7N9 are of most concern as they can cause severe symptoms in humans, leading to a high mortality rate. Globally, as of June 2, 2023, there have been 876 human infections with H5N1, including 458 deaths reported in 23 countries since 2004, a mortality rate of 52.2%, while H7N9 has caused 1,567 human infections and 615 deaths, a mortality rate of 39%.[4,6]

Figure 1. Distribution of Confirmed Human Cases of H5N1 Infection by Year of Onset and Country (2003-2023)[6]



Note: Includes two detections reported in 2022 from Spain and one from the US due to suspected environmental contamination and no evidence of infection.
Source: ECDC

H5N6 has been reported in China and Laos, causing 84 human infections and 29 subsequent deaths, a mortality rate of 35%.[1] H9N2, first identified in humans in 1998, is a low pathogenic AIV and therefore differs in virulence from H5N1 and H7N9. As it is not a notifiable infection, only 124 human infections and one death have been recorded.[6]

Since the 2009 "swine flu" pandemic, the influenza A H1N1 virus circulates seasonally, causing multiple infections, hospitalizations and deaths. The CDC estimates that in the US, from 2009 to 2018 there were over 100 million infections, of which fewer than 1% of individuals were hospitalized. There were a reported 75,000 deaths, a mortality rate of 0.075%.[11]

Vaccines

One of the ways to combat a pandemic is through mass population immunity. Immunity can occur either through natural infection or vaccination. Creating vaccines is a long and arduous process, but as there are already approved influenza vaccines, adapting them to new strains typically only takes around 6 months.[4]

The development of messenger ribonucleic acid (mRNA) vaccines is not new, but they came to the forefront during the COVID-19 pandemic when they were rapidly approved in response to the SARS-CoV-2 viral outbreak in humans. mRNA vaccines have many advantages, particularly as part of a pandemic response, as they can be manufactured quickly and are highly scalable.

In 2016, the European Medicines Agency (EMA) granted conditional marketing approval for the pandemic influenza vaccine H5N1 AstraZeneca, meaning that it was approved in the interests of public health based on less comprehensive data than normally required, as the medicine addressed an unmet medical need.[12] The US Food and Drug Administration (FDA) has also licensed the use of two H5N1 influenza virus vaccines.[13]

Surveillance

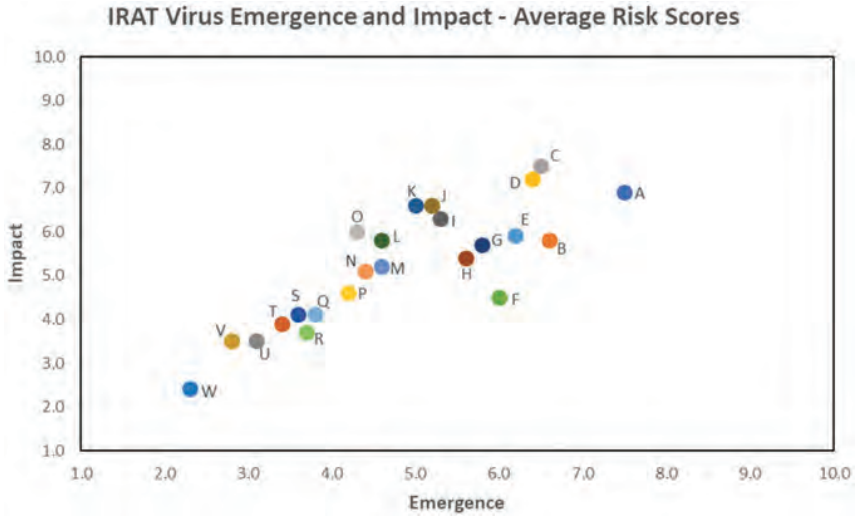
In 1982, the WHO established a global influenza surveillance network, known as the Global Influenza Surveillance and Response System (GISRS). It was set up to prepare, monitor, alert for and respond to influenza outbreaks. It subsequently developed the Tool for Influenza Pandemic Risk Assessment (TIPRA) in 2016 to estimate the risk of a pandemic from novel influenza strains.[1]

The CDC also has a risk assessment tool for pandemic potential posed by influenza A viruses, known as the Influenza Risk Assessment Tool (IRAT).[8] Both the WHO and CDC models take into consideration features such as viral transmission in animal models, population immunity, the severity of disease, infection rates in humans and animals, genomic make-up of the virus, and the geographic spread of disease in risk assessment.

Conclusions

With the avian influenza virus now circulating among multiple animal species, there is an increased chance of AIV mutating and becoming more infectious in humans. At present, human infections with AIVs tend to be a direct result of handling infected poultry and not because of human-to-human transmission. However, AIV has pandemic potential due to the emergence of new viral subtypes including H5N1 and H7N9, both of which have a high mortality rate. As the virus continues to spread in birds and animals, more human infections can be expected. As it has not yet adapted to allow for sustained human-to-human transmission, the likelihood of an avian influenza pandemic is presently very low.

Figure 2. CDC IRAT Virus Emergence and Impact Risk Scores (see table, next page, for further detail)[8]



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Dot	Influenza Virus	Emergence Score	Impact Score	Risk Assessment Year
A	A(H1N1) [A/swi ne/Shandong/1 207/2016]	7.5	6.9	Jul-20
B	A(H3N2) variant [A/Ohio/1 3/2017]	6.6	5.8	Jul-19
C	A(H7N9) [A/Hong Kong/1 25/2017]	6.5	7.5	May-17
D	A(H7N9) [A/Shanghai/02/2013]	6.4	7.2	Apr-16
E	A(H9N2) Y280 lineage [A/Anhui- Lujiang/1 3/2018]	6.2	5.9	Jul-19
F	A(H3N2) variant [A/Indiana/08/2011]	6	4.5	Dec-12
G	A(H1N2) variant [A/California/62/2018]	5.8	5.7	Jul-19
H	A(H9N2) G1 lineage [A/Bangladesh/0994/201 1]	5.6	5.4	Feb-14
I	A(H5N6) clade 2.3 4 4b [A/Sichuan/06681 /2021]	5.3	6.3	Oct-21
J	A(H5N1) Ciado 1 [A/Vietnam/1 203/2004]	5.2	6.6	Nov-11
K	A(H5N6) [A/Yunnan/14S64/201 5) – like	5	6.6	Apr-16
L	A(H7N7) [A/Netherlands/21 0/2003]	4.6	5.8	Jun-12
M	A(H5N8) clade 2.3 4 4b [A/Astrakhan/321 2/2020]	4.6	5.2	Mar-21
N	A(H5N1) clade 2.3 4 4b [A/American pigeon/ South Carolina/AHOI 05145/20211]	4.4	5.1	Mar-22
O	A(H10N8) [A/Jiangxi Donghu/346/2013)	4.3	6	Feb-14
P	A(H5N8) [A/gyrfalcon/Washington/41088/2014]	4.2	4.6	Mar-15
Q	A(H5N2) [A/Northern pintail/Washing-ton/40064/2014]	3.8	4.1	Mar-15
R	A(H3N2) [A/swine/Illinois/1 2101/2015]	3.7	3.7	Jun-16
S	A(H5N1) [A/American green-winged teal/Wash-ington/1057050/2014]	3.6	4.1	Mar-15
T	A(H7N8) [A/turkey/Indiana/1 573-2/2016]	3.4	3.0	Jul-17
U	A(H7NO) [A/chicken/Tennessee/1 7-007431 - 3/2017]	3.1	3.5	Oct-17
V	A(H7NO) [A/chicken/Tennessee/1 7-007147- 2/2017]	2.8	3.5	Oct-17
W	A(H1N1) [A/duck/New York/1 006]	2.3	2.4	Nov-11

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