

# Past, Present, Future – Innovations Successfully Adopted in Life Underwriting

*by Selma Hodzic & Dave Nicholas, Gen Re, London*

Historically, insurance premiums were differentiated only by age, with gender (now removed in some markets) and smoking incorporated later. The introduction of a numerical rating system 100 years ago meant underwriters could immediately better differentiate medical risk. This allowed them to broaden their offers of cover beyond "only healthy individuals", thereby realising the significant economic potential and much greater inclusion by extending cover to so-called substandard risks. The expanded process of evaluating impaired health histories required a more complex medical assessment to allow individuals who presented a higher insurable risk to be assessed fairly. The mechanism of applying extra mortality and morbidity ratings to the basic premium opened the way for other flexible underwriting solutions to be introduced; for example, applying exclusion clauses for discreet medical conditions.

## The not so distant past

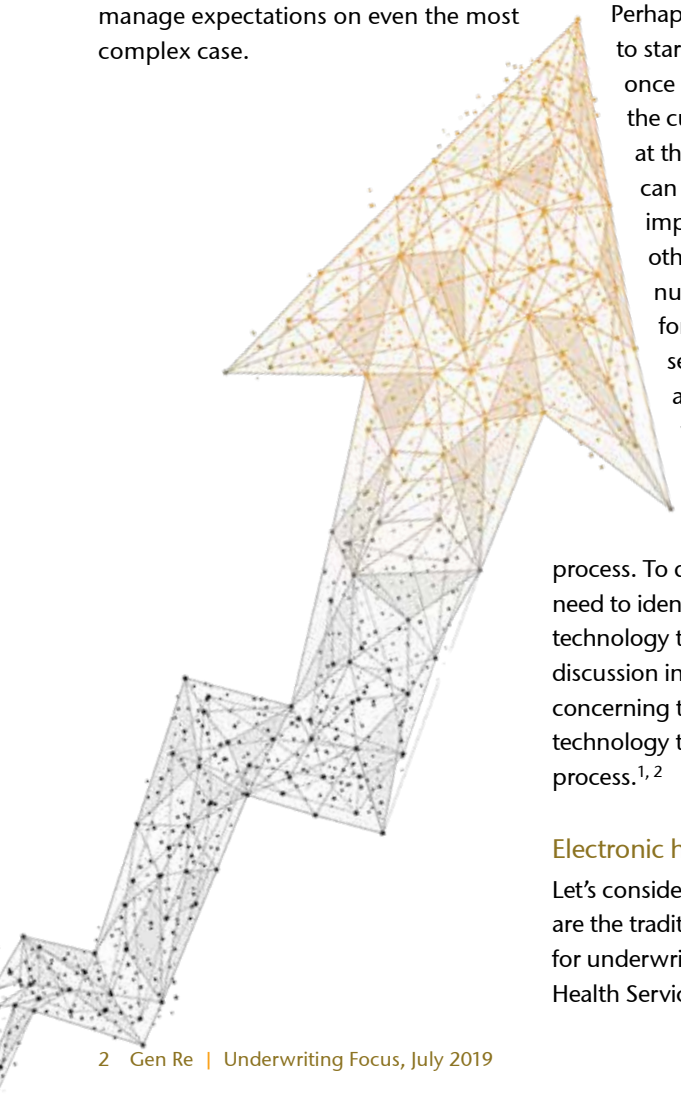
The emphasis on reducing the costs of risk selection, coupled with a desire for greater productivity, gathered momentum in the early 1990s, and was a trigger for the development of Underwriting Rules Engines (UREs) – software systems that differentiate risk based on decision trees and databases of defined rules. Investment in this type of software has been significant and constant. In some markets, it is common for more than 70% of Life insurance applications to be processed this way. The implied lack of human intervention is a myth since the complex logic they contain is managed by underwriters. This ensures applications processed automatically fall within the risk boundaries of the insurance company. It is also an example of the role of the underwriter subtly undergoing change.

Tele-interviewing, and even underwriting over-the-phone, were introduced to help applicants more easily disclose relevant risk data. Deliberate misrepresentation is relatively rare, and the life industry has a robust methodology for dealing with false claims, while tele-interviews can promote over-disclosure of irrelevant information. However, these drawbacks led to low adoption of this model. Despite this, the approach continues to be used successfully by some companies seeking to gather more complex medical and background information, particularly in applications for Disability Income (DI) insurance where the applicant may hold considerable insights on, for example, their musculoskeletal condition.

## Content

## Where we are now

In the UK, an individual has the right to request copies of personal data held by their doctor using a Subject Access Request (SAR). For a while, some insurers used an SAR as a quicker and cheaper alternative to accessing copies of doctors' reports using the traditional form-based method. The SAR request elicits copies of an applicant's complete medical record, helping reduce any misrepresentation, intentional or not, and some companies were even able to argue for lower premiums based on this. However, data protection legislation interpretation meant SARs featured only briefly in an underwriting context. Paramedic screenings, shortened examinations performed by nurses in place of doctor-led examinations, have also had a sustained positive impact, particularly for providing more flexibility and convenience for customers. Some companies today operate helpdesks where intermediaries can link directly with underwriters and this helps manage expectations on even the most complex case.



The initiatives described above have all had a positive effect, with the most sustained impact being the URE. Advances in technology have also meant increased ease in the ability to interrogate and analyse the underwriting process. Even the most complex of rules are now regularly reviewed in granular detail, by multi-functional teams all aimed at improving customer experience without unduly impacting quality and most importantly, price. But we cannot ignore the potential for further improvement. Transforming existing business models and processes and aligning them with new ideas is of major importance. Today's customers are more demanding, with higher expectations for service and convenience than ever before. Easy access, transparency, fairness and clarity are all key for any organisation where service is paramount, and this includes insurers. So, the burning question is, what's next in the underwriting space?

## Where could all this be heading?

Perhaps the most obvious place to start is to go back to basics – to once again review each step in the current process and look at those areas where change can have the most obvious impact. In other words, explore other areas where reasonable numbers of relatively straight forward referrals are still seen by an underwriter, and look at ways in which we can further ensure that underwriters see only what is relevant to the decision-making process. To do this, however, we also need to identify any other advances in technology that can help us. See also the discussion in *Underwriting Focus 1/2018* concerning the potential for new digital technology to innovate the underwriting process.[1, 2]

### Electronic health records

Let's consider the medical records that are the traditional source of information for underwriters in the UK. The National Health Service began work building electronic health records (EHR) in 2005. The goal is for all patients to have an EHR and even augment this with data of their own. This is timely since many patients now receive prescriptions for apps in place of drug therapy, or they use wearables and digital solutions to monitor and recover their health. This means they are creating a separate digital record stored on a smartphone.

> *Risk calculators are already used in underwriting manuals*

A group of UK insurers have collaborated with a technology company to build a solution to manage the end-to-end process, including: patient consent, report requesting and creation, the redaction of non-permitted information, report delivery and payment. For some time too, paramedical screening reports and blood test results have been passed electronically from evidence providers to insurers. At least one UK insurer has enhanced its platform to process this information without underwriter intervention.

### Risk calculators

In the immediate future we can expect to see the automation of any condition that can be simply assessed by running it through some form of risk calculator. Calculators have already been used for underwriting assessment of diseases such as HIV, tumours, hyperlipidaemia, hypertension, type 1 and 2 diabetes, or myocardial infarction and coronary artery disease (see e. g. the calculators in the Gen Re underwriting manual CLUE).

If these medical impairments are well controlled, the underwriting process can simply be automated. There will be no need for the human underwriter to see any of these cases, and these kinds of solutions are expected to be adopted into practice in the foreseeable future, by applying very simple digital tools.

### Artificial intelligence

Artificial Intelligence (AI) is a part of the computer science that is finding ways to develop predictive models for

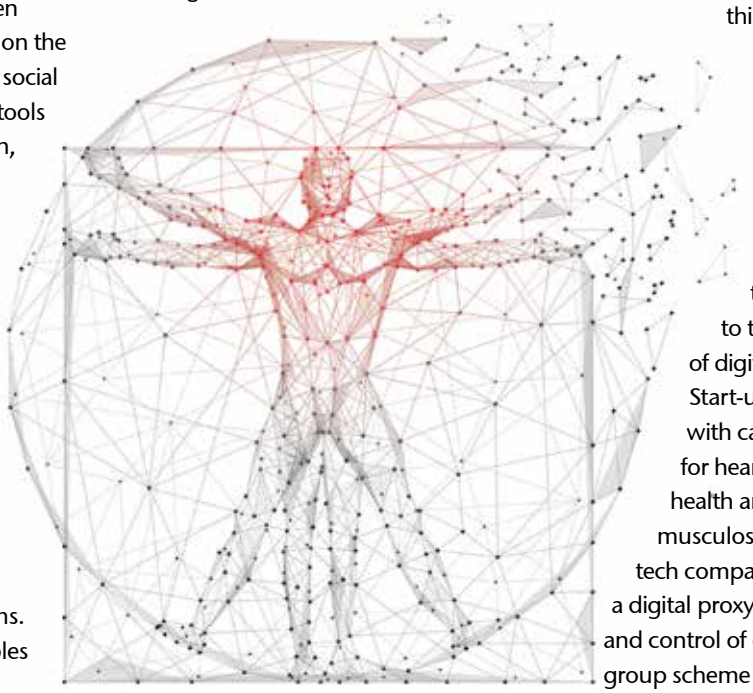
machine learning. This is the essence of AI, so that it can be implemented in the computational decision-making process. From analysis of data-pools, algorithms that are based on predictive modelling are designed. The goal is to achieve the best possible outcome and solution for any given task. Predictive models are being used to develop "the intelligent system", with the goal of absolute computational rationality and cognitive reasoning.

As we all know, AI has already been rooted in many gadgets available on the market. A good example of this is social media creating facial recognition tools – along with character recognition, language translation, speech recognition tools, wearables, TV streaming services, and plenty of other commonly used systems that are in circulation at the present time. These systems all have the same goal, to achieve the highest efficiency for the customers, in every industry and in any sphere of the modern world.

However, these systems are characterised as "weak" AI systems. Among the above-named examples is Apple's Siri application, which might be the most trivial example of today. These systems are defined as weak because they have very limited tasks. This is also called Narrow Artificial Intelligence (NAI). The "strong" AI system, the so-called Artificial General Intelligence (AGI), is a system that is supposed to be making complex rational decisions, resembling the rationality of the human brain. Unfortunately, no examples of the AGI system exist, as the technology is not quite there yet, and this system is still hypothetical. This means that we are still at the beginning of our journey with finding solutions to achieve the ultimate goal: to develop the highly rational AGI "strong" AI system.

### Data challenges

Life insurance companies possess the huge amount of data that is initially required for any AI project and data mining to be successful. The difficulty lies, however, in the fact that this data is often unstructured, including handwritten text, scanned documents and even picture images. This makes it challenging for current Optical Character Recognition (OCR) software to extract relevant data for underwriting or to develop a sophisticated underwriting AI system. While this capability is being developed, one solution might be for underwriters to design risk assessment protocols that do not require written reporting. In time, OCR solutions will facilitate this. Several companies are building AI-based predictive engines, by ingesting and coding data about past underwriting and matching new risks to archetypes in their databases. The aim is to trust the system to learn from past experiences and outcomes to produce better results.



Another interesting angle is using AI to drive lower levels of misrepresentation. Imagine a scenario where the URE can interrogate the number of changes made by the customer when answering the medical questions and, depending on what changes are made and on what conditions, identify whether the chances of misrepresentation are higher based on previously learned logic. Sounds far-fetched but it's a concept that is already being considered.

> *Data quality is important for analysis*

### Start-ups

New technologies being built by start-ups and new companies with digital solutions have the potential to augment or even replace elements of the traditional underwriting process. Health-related apps use algorithms to deliver appropriate therapeutic interventions to users, but this is only possible once the device has been calibrated to the individual. This calibration process, effectively to obtain a baseline of the person on entry to the program, is a form of digital risk assessment. Start-ups that Gen Re works with can establish baselines for heart health, mental health and the condition of the musculoskeletal system. Another tech company is working to deliver a digital proxy for the management and control of diabetes. Financial and group scheme underwriting can also be augmented using digital insights, and several start-ups are developing tools for this purpose. Others are working on ways to glean actionable insights from social media data. The next generation of hardware will facilitate virtual and augmented reality solutions, and these could play a role in underwriting assessments; for example, at point of sale. Indeed, digital ideas could open the way for continuous underwriting, offering variable levels of cover or rewards for positive health behaviours.

## Conclusion

It's not just about new technology. The next generation of underwriters will require different skills to be able to maximise its potential. They will work closely with data, programme new machines, manage relationships with technology companies and define a new set of digital risk selection criteria.

The established analogue model for underwriting using clinical assessment has the potential to be flipped into a more convenient, accurate and customer-centric method incorporating lifestyle and data variables. To prepare, underwriters can get involved in the discussion, participate in technology projects and drive innovation.

## Endnotes


1 Tiedemann, A. (2018). Brave new underwriting world – Challenges and chances of future underwriting. Underwriting Focus, 1/2018, 1–6.

2 Farkas, A. & Quilter, B. (2018). Digitalising trust – Going beyond biometrical underwriting. Underwriting Focus, 1/2018, 7–11.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