THE EUROPEAN ACTUARY

QUARTERLY MAGAZINE OF THE ACTUARIAL ASSOCIATION OF EUROPE

Nº 28
DEC 2021

aae actuarial association of europe

INTERVIEW

SETTING TARGETS FOR THE AAE

INTERVIEW BY
JENNIFER BAKER

The Actuarial Association in Europe (AAE) has identified major goals. Delivering on these objectives is part of the responsibility of the Board of Directors of the AAE, which wants to develop the European actuarial profession so it is ready to provide objective, independent, professional advice to European institutions and stakeholders on all matters of actuarial relevance, in pursuit of the public interest and strengthen cooperation within the industry.

The Chair of the board, Mária Kamenárová, has a wealth of experience to draw upon to meet this challenge. She is currently Risk Manager at Swiss Re as well as the current President of the Slovak Society of Actuaries.

MS KAMENÁROVÁ'S specialisation is in financial and operational risk management, Solvency II, IFRS 17 and actuarial fields in both life and non-life insurance and pensions. She has a PhD in the quantitative method in economy in Economic University in Bratislava.

Can you explain the Actuarial Association in Europe's current strategy?

'The strategy is defined by three objectives: build a strong European actuarial community; enhance the relationship with the European institutions by playing a prominent role in shaping the development of new European legislation; and promote professionalism and help to ensure that the regulated actuarial work is performed by those who are properly qualified to undertake it and are subject to the professional standards. This strategy was defined in previous years, but the implementation of these strategic objectives is the main focus for me, as only by then we can see the difference and have proof of our added value.

We would like the brand of the '*European Actuary*' to be widely recognised and to further

strengthen it. Our aim is to promote the understanding that fully qualified actuaries provide a guarantee of high quality professional work, done by those who are properly skilled, experienced and are acting within the professional code of conduct, under the professional standards. For example in October this year new continual professional development (CPD) requirements were approved. They define minimum hours of additional studies in either hard skills or soft skills for all qualified actuaries. We believe that clarification of the '*fit and proper*' requirements will be achieved. That might evolve to recognition by national regulators across Europe for the qualified actuaries that are members of local actuarial associations.

'We would like the brand of the 'european actuary' to be widely recognised and to further strengthen it'

We define '*fit*' as complying with the European Core Syllabus, Code of Conduct and Professionalism standard. Our goal is to provide assurance to our stakeholders: managers in insurance companies, pension funds, regulators, and also consumers, that it is safer for them to select qualified

MÁRIA KAMENÁROVÁ

individuals who are experienced in performing the services of for example chief actuaries, responsible actuaries, pricing actuaries, or actuaries in risk function and so on. The next very important part of our strategy will reflect the most recent challenges arising in society either the ageing population, climate and sustainability risk or review of many existing European regulations. And last but not least we want to keep our volunteers engaged and attract new ones.'

What goals do you want to achieve?

'There are many and it is important to be selective and to prioritise carefully. We are working on a volunteer basis thus it is extremely important to keep the active members of our

professional community engaged and to listen carefully to their advice and preferences. After that it is important to find the common ground for topics where we have agreement and create the action plan.

Currently we have identified six main goals. They are:

1. Provide best advice to the stakeholders in Solvency II framework review;
2. Implementation of IFRS 17;
3. Adequacy of pension systems;
4. Evaluation of Covid 19 impact;
5. Promote professionalism and education; and
6. Assess sustainability and climate risks.

The current top risks are identified in the Environmental, Sustainable and Governance (ESG) area, therefore it is important to formulate and clarify the AAE position and to communicate clearly the concrete deliverables. For example, that means to work on and get clarification around the climate risk scenarios for insurance companies, but also for pension funds and IORPS.

'There are new initiatives like the pension tracking system (pts) or pension dashboard'

Next to this important area for sustainability, is in pension systems, although the situation is different in each member state, there are new initiatives like the Pension Tracking System (PTS) or Pension Dashboard. PTS should provide consumers with consistent and understandable information about the performance of pension plans at national level.

Our interest is to provide the proper guidance on how to allow for the proper implementation of the European differences in the IFRS 17 standard, that covers the accounting standard for insurance contracts.
AAE provides the platform to our member associations to exchange experience and knowledge in these areas and related governance, and to explore the possibilities to get the recognition of actuaries as Reporting Actuary in European legislation. It is not easy as it seems as there is a shortage of strong political support.
Currently the roles for actuaries under statutory technical reserves (in some member states it will be IFRS standard) are governed by local rules.
The definition for local rules range from highly regulated and supervised like in Spain, to the opposite end of the spectrum, not being regulated at all, for example, in Slovakia.

There are also short term goals as we are organising several events for actuaries. The most important one is the AAE round table on Solvency II review and expectations towards the actuaries in post-pandemic world, and among others is the 4th European Congress of Actuaries in June 2022 in Madrid.'

Finally, what is your opinion of the development of the profession?

'It is very important to engage young actuaries.
To create the interesting career opportunities that help them to be well prepared to address the challenges in the near or more distant future. The actuarial profession has an irreplaceable place in society. We are able to be flexible, skilled professionals that act with high integrity and can model future risks, but we have to improve our communication of professional judgement and to market more our skills and main strengths.'

MEASURING MORTALITY

USING 2020/2021 DATA

BY **MATTHEW EDWARDS**
AND **STEVE BALE**

This article sets out the UK profession's plans regarding the use of 2020 and 2021 data, in particular regarding pensioner, annuitant and life assurance mortality. To what extent can mortality data from 2020 and 2021 be of use, given how abnormal these years have been? Exactly the same question faces actuaries working in life insurance and pensions, in the UK and in virtually all countries affected by the COVID-19 epidemic. The underlying discussions and analysis have been conducted by the profession's Continuous Mortality Investigation (CMI).

MATTHEW EDWARDS is Chair, CMI.
STEVE BALE is Chair, CMI COVID-19 Working Party.

BACKGROUND

The year 2020 was an extraordinary (and we hope unique) year for mortality because of the pandemic. In the UK there were approximately 73,000 excess deaths above that expected based on mortality in 2019. We are now most of the way through 2021, and deaths from COVID-19 are still a significant number (70,000 to 5 November 2021, based on national statistical information on deaths with COVID-19 listed on the death certificate). However, the mortality experience of 2021 is unusual owing to factors beyond '*just*' the COVID-19 deaths: in particular, increased other-cause (non-COVID) deaths arising from delayed diagnoses and treatment due to the lockdowns, and a reduction in deaths in respect of those people who died from COVID-19 in 2020 who might otherwise have been expected to die in 2021 (the '*forward displacement*' effect). It is difficult to reach objective conclusions in this situation.

The graph below shows how mortality in 2020 and 2021 (to 5 November) compares with 2019 in particular, showing also the range seen in the previous decade. As a simple metric, standardised mortality rates are used.

The chart clearly shows the abnormally high mortality of England and Wales resulting from the pandemic. In particular, we can see that standardised mortality in the first wave of the pandemic in Quarter 2 of 2020 and the second wave of the pandemic in Quarter 4 of 2020 and Quarter 1 of 2021 were materially higher than mortality for the same period in 2019. We can also see some mortality reduction in the second quarter of 2021.

THE CMI'S USE OF EXPERIENCE DATA

The experience investigations we carry out in the CMI fall into broadly two types:

- **'*Actual versus Expected*' analyses**, where we assess how the experience of a year or group of years compares with what would be expected based on the most appropriate tables.

  The CMI will carry on doing this type of analysis on 2020 and 2021 data. This will help subscribers to see how their own experience compares with that of others.

- **Development of new mortality tables**, from analysis of the probability of death at any age followed by smoothing across the age range ('*graduation*', primarily to remove noise). This work aims to derive mortality tables that are predictive of future experience. Clearly, deriving tables based partially on unadjusted 2020 and/or 2021 CMI data is unlikely to be predictive. However, we have not found a satisfactory way to adjust 2020 or 2021 CMI data for this purpose, as we discuss below. Therefore, as a general principle, the CMI is not intending to develop new mortality tables using data from 2020 or 2021.

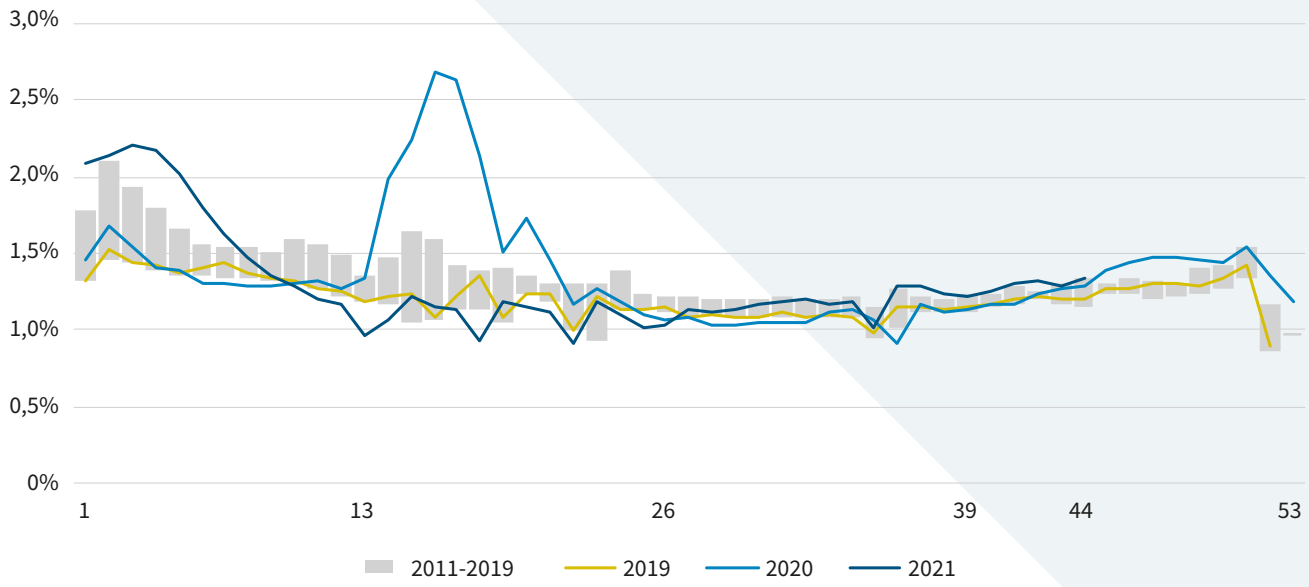
POSSIBLE APPROACHES TO ADJUSTING THE 2020 AND 2021 EXPERIENCE

We have spent considerable time considering whether we can remove the pandemic's effect from the 2020 and 2021 mortality data. We have considered two approaches – a '*bottom up*' approach using data on deaths directly attributable to COVID-19, and a '*top-down*' approach looking at '*excess deaths*' (deaths above those expected, and hence likely attributable to the pandemic).

BOTTOM-UP APPROACH

A bottom-up approach could work using (in the case of the UK) national statistical data on deaths with COVID-19 listed on the death

FIGURE 1: MEASURING MORTALITY USING 2020/2021 DATA



certificate, UK public health data records deaths within 28 days of a positive COVID-19 test. However, there are several areas of difficulty:

- Some COVID-19 deaths are likely to have been assigned as other causes of death.
- We would need to calculate from public domain data a COVID-19 mortality age curve.
- Insurance portfolios and pension funds typically exhibit different socio-economic profiles from the general population, and so we would need to allow for how COVID-19 affects these different 'insured' lives.
- We would need to calculate an '*amounts weighted*' equivalent of the above (without confounding with the socio-economic effect).

Each of these steps involves substantial subjectivity and room for error; the combination of these steps would likely lead to results which would be of little use.

A further concern with this approach is that, while almost plausible in dealing with 2020, the approach would be of no use in 2021 because the other elements making 2021 an abnormal year (for instance, forward displacement and delayed diagnoses) would not be allowed for. But we would want any adjustment approach to work well in both years (and perhaps even 2022).

Overall, therefore, we do not regard this approach as being a useful way to adjust 2020 and 2021 data.

TOP-DOWN APPROACH

A top-down approach would seek to define deaths caused by the pandemic as the difference between actual deaths, and those that would otherwise have been expected: this difference being the '*excess*'.
This has been a very useful approach for quantifying the pandemic's overall mortality impact for the purpose of the CMI's regular **mortality monitoring**.


MATTHEW EDWARDS

However, this approach is not so well-suited to adjusting 2020 and 2021 data for the purpose of subsequent analyses of that adjusted data. The reason is that the '*actual less expected*' method is sensitive to what we define '*expected mortality*' to be. In simple terms, we would be quantifying '*non-pandemic deaths*' as (Actual deaths less Excess deaths), where Excess deaths are themselves defined as (Actual deaths less expected deaths). In a circular fashion, we end up calculating non-pandemic deaths as expected deaths.

This means we are not bringing into our analysis any information on actual 2020 or 2021 mortality: we have simply brought in a prior expectation through the back door. For this reason, the top-down approach is of no use in adjusting data to arrive at an idea of what 2020 (or 2021) mortality has been '*absent the pandemic*'.


STEVE BALE

POST-PANDEMIC MORTALITY

Perhaps more importantly, when will we start to understand the shape of post-pandemic mortality?

It may be that the first consecutive four-year period that we are able to use for developing tables is the period 2022-2025, in which case the underlying work would not be done until 2027 at the earliest.

However, work on '*Actual v Expected*' in respect of the individual years (especially 2022 and 2023) will give a much earlier view on what post-pandemic mortality for insured portfolios and pension funds looks like.

FINAL THOUGHTS

This paper outlines the thinking we in the UK have undertaken when looking at how best to manage the use of data from 2020 or 2021, and how difficult it is to extract from these years any clear indication of underlying mortality – whether '*non-pandemic*' mortality, post-pandemic mortality, or yearly mortality trends. Similar arguments will apply to work elsewhere: in many countries there is likely to be little objective data to guide actuaries reliably as to how to adjust reserves or valuations to account for the impact of the pandemic now and in the future.

SOLVENCY II:
AN IMPORTANT STEP TOWARDS
AN AMENDED FRAMEWORK

BY **SIEGBERT BALDAUF**

SIEGBERT BALDAUF

The Solvency II review process seems to be on the home straight. EIOPA had provided the requested technical advice to the EU-Commission on 17 December 2020 together with extensive background and impact analysis. This analysis was substantiated by two impact assessments conducted by EIOPA with reference date 31 December 2019 (Holistic impact assessment - HIA) and 30 June 2020 (Complementary information request – CIR).

Widely following this advice, the Commission has proposed amendments of the Solvency II-Directive, published on 22 September 2021. The proposals are accompanied by an assessment of the expected impact on the capital position of undertakings. For this the Commission adapted EIOPA's impact assessment by their proposals. A gradual phasing-in is planned for two changes which can have significant impact on undertakings solvency. Thus the estimated short-term capital relief of 90 billion euro at entry into force of the amended framework will decrease considerably until the end of a transition period in 2032.

PROPOSED AMENDMENT OF THE FRAMEWORK

The proposed amendment leaves relevant questions open which hinder an analysis:

a) A reliable assessment of the resulting change of the Solvency II-framework is not possible. Specifications of relevant methods and parameters shall be laid down in upcoming delegated acts or implementing technical standards. Without additional guidance in the Directive, this leaves room for a future transformation and hinders the assessment of the current proposal.

b) A robust and reliable impact assessment is missing. It is yet unclear on which basis the short-term capital relief of 90 billion Euro has been determined. The impact resulting from the proposed changes will significantly depend on the underlying interest rate environment and on the final specification of the parameters and methods. This overall sum does not reveal the different exposures of countries or lines of business. A meaningful interpretation is not possible.

The political priorities of the EU like the European Green Deal or the Capital Markets Union require high investments. Commission's proposed amendments aim at strengthening the role of insurers as long-term investors, by removing regulatory obstacles. As some aspects of current regulation are assumed to be overly prudent this should be achieved without unduly lowering policyholder protection.

VALUATION OF LONG-TERM BUSINESS

Valuation of liabilities stemming from long-term contracts is a crucial issue in the Solvency II-review. The risk-free interest rate (RFR) term structure is the decisive element for this purpose. The proposals directly affect the determination of the relevant RFR and the volatility adjustment. Considerations concerning interest rate stress and the risk margin are published in an additional communication paper (COM(2021) 580 final). EIOPA's impact assessment showed that changes of the following four elements will have a significant impact on the capital surplus of undertakings.

EXTRAPOLATION

Commission proposes to replace the current extrapolation method by an alternative methodology in line with EIOPA's advice. In a low interest rate environment this will require more capital than the current Smith-Wilson method. Market changes can lead to a higher volatility. EIOPA's impact assessment proved this drawback. The drastic deterioration of the RFR in the first half of 2020 resulted in a loss in capital surplus. To mitigate such effects EIOPA proposed a '*mechanism*', which should allow a gradual phasing-in triggered by the interest rate at the starting point of the extrapolation. The '*mechanism*' would apply if this rate would be lower than that observed end of 2019.

The main reason for this methodological sensitivity is the waiving of a reliable convergence process, which currently stabilises the RFR by requiring a convergence towards the UFR in a fixed period and thus prevents a carrying forward of short- or medium-term financial turmoil to the entire RFR.

The Commission's proposal of an unconditional transition period until 2032 for the implementation of the new methodology shall avoid disruptions during this period. But this does not remedy the identified

fundamental weakness of this methodology which will contribute to a significantly increased volatility.

VOLATILITY ADJUSTMENT (VA)

Commission's proposal is a simplified formula for the calculation of the VA. The risk-corrected spread is still determined on the basis of a currency-specific reference portfolio. A credit spread sensitivity ratio (CSSR) is introduced to reflect undertaking-specific conditions. The VA shall then amount to 85% of this product. The specification of the CSSR and of details for the calculation of the spread shall be specified in delegated acts. The VA can be increased by a macro-economic VA as proposed by EIOPA. It remains unclear how far EIOPA's deep analysis of the VA will be considered in the upcoming regulation. For instance, the illiquidity of liabilities included via an application ratio in EIOPA's advice, is no longer addressed by the Commission.

INTEREST RATE RISK (FOR THE STANDARD FORMULA)

The risk of changes of the RFR shall be reflected on the basis of EIOPA's advice. But the stressed risk-free interest rates shall be derived only up to the starting point of the extrapolation. The resulting stressed curve should then be extrapolated. A stress of 15 bp of the ultimate forward rate will be considered. The AAE had advocated such a proceeding (first stress – than extrapolate) which is more in line with the one-year time horizon for the calculation of the solvency capital requirement.

RISK MARGIN

An adaptation of EIOPA's proposed lambda approach is considered. The lambda parameter had been introduced by EIOPA to attenuate the contribution of projected future capital requirements. A floor should limit the possible reduction. Commission considers to remove this floor parameter and in addition to reduce the cost of capital rate from currently 6% to 5%.

NEXT STEPS

The proposed amendment of the Directive will now be scrutinised by EU-Parliament and Council. The expected negotiations can lead to further adaptations. As the work of actuaries will be affected considerably by the proposed changes, the AAE will monitor developments and provide professional analysis.

SIEGBERT BALDAUF is an independent actuary and Chair of Solvency II Working Group for AAE.

NEWS FROM THE ITALIAN ACTUARIAL CONGRESS

EVOLVING THE ACTUARIAL MANAGER TO A GLOBAL ACTUARY

BY **GIAMPAOLO CRENCA**

The XIII Italian Actuarial Congress was held on 10-12 November 2021 as a hybrid conference in Rome and online webinar.

Over 1.200 delegates attended (even though there are only 1.118 fully qualified actuaries registered in Italy). There were 37 sponsors, 142 speakers (including about 15 international executives), 3 international sessions delivered for the first time completely in english, 15 sessions (10 running in parallel). Speakers were from varied backgrounds, including from insurance and pension firms, institutionals, politicians, other professionals, regulators, academics and the press.

THE TITLE OF THE CONGRESS was '*Technology innovation and systemic risks: the actuary as an assessor of uncertainty*'. This was an ambitous title and took us from the Actuarial Manager (launched during the Rome 2018 congress) to the Global Actuary, which is the project for the next 15 years.

The Global Actuary looks to new risks, including the systemic, and is no longer limited only to a single company but has a broader outlook, perhaps at group or regional level, and even wider (including, for instance, climate risk). This requires a wider view where complex expert judgments are needed and including new quantitative approaches. The project really started with the 2013 congress where the '*Actuary of the future*' was launched.

11 YEARS AGO, the Italian National Council of Actuaries aimed to change its mentality, approach and organization, carrying out a challenging development project to make actuaries more relevant able to support society, business, politics and the Italy's development. The message was that actuaries are not only good at evaluations, but also

Nightview of St Peter's Cathedral and Tiber River in Rome Italy.

bring passion, ideas, courage, management, a global outlook and strategic vision.

THIS CONGRESS AIMED to renew the proposal to establish a '*systemic risk task force*' which was supported by delegates. They were also particularly interested in wider fields, and to help actuaries to develop into senior leaders.

A PLENARY SESSION and three parallel sessions were dedicated to the topic of wider fields, covering capital management, artificial intelligence, machine learning, climate risk, ERM, ESG, big data and systemic risks.

To help actuaries develop into senior leaders, there was a debate about how to best increase in the role of the actuary in the governance, indirect or direct. These are different roles and some actuaries involved in company governance role spoke about their own experiences. They also noted the increase in actuaries working in governance roles at insurance companies and in pension funds.

TWO SESSIONS were dedicated to the development of IFRS17 and the application of IORP2 in order to discuss technical problems and the role of actuary in these projects.

Good feedback was received on the three sessions in English, where speakers described the activities of the AAE and IAA.

An important and strategic final session concerned the future overview of the insurance market post-pandemic. The insurance market, supervisory authority and actuaries debated this and ways forward were suggested to help insurers innovate and transform.

WHY ARE PEOPLE STRUGGLING WITH MENTAL HEALTH CONDITIONS BEING DENIED COVER?

BY **ESKO KIVISAARI**

Mental health conditions make insurance cover inaccessible, at least in some countries. Is there a good actuarial motivation for this?

Esko Kivisaari MSc is Fellow of the Actuarial Society of Finland and Deputy Managing Director of Finance Finland (member of Insurance Europe, EBF and Efama). He is also Past Chairperson of the Actuarial Association of Europe, and he was a member of the High-Level Expert Group on Sustainable Finance.

Mental health conditions make insurance cover inaccessible, at least in some countries. Is there a good actuarial motivation for this?

Traditional thinking has been that struggling with mental health can lead to a higher risk of suicide, together with a higher risk of accidents and physical health problems. This has led to the underwriting practice of denying cover for medical expense insurance and for individual life contracts with a larger than average sum assured.

> *'Traditional thinking has been that struggling with mental health can lead to a higher risk of suicide'*

The concept of mental health has gone through fundamental changes. In the mid-twentieth century, problems were considered rare. A Finnish source states that around one percent of people suffered from mental health problems at that time. In today's world, mental health diagnosis is more commonplace.

[1] Wittchen, Hans-Ulrich & Jakobi, Frank 2005: *Size and Burden of Mental Disorders in Europe. A Critical Review and Appraisal of 27 Studies*. – European Neuro-psychopharmacology 15(4): 357 – 376 (pages 357, 368 – 369).

Some sources tell that at least one in five among us experience a mental health problem in a typical year. A study in 2005 arrived at a result saying that 27 per cent of EU citizens had suffered from mental health problems of different severity during the year preceding the study[1]. The reason for the increase is not clear; it could be improved diagnosis, an increase in risk caused by our modern lifestyle or that, as the stigma associated with being a sufferer has diminished, mental health problems are more likely to be disclosed.

The good news is that as mental health problems are better understood, the options for managing and treating have also improved. Therapy and counselling can help with understanding the root causes and plan coping strategies. Medicines have improved leading to a dramatic decrease in suicide rates in many countries. There is a clear understanding that while some serious forms of suffering still increase the risks, in a majority of diagnoses this is not the case. One can also speculate that individuals taking good care of their mental health might actually be less risky than those who avoid therapy.

Insurers should therefore upgrade their understanding of mental health. Actuaries are well-positioned in taking this forward. Pooling of risks always needs good underwriting practices, and in some extreme cases this can mean exclusion.

Actuaries certainly should not be working alone on this topic. The full understanding of different factors, symptoms and treatments is not included in the expertise of actuaries. Insurers would also need the expertise of psychiatrists and medical doctors who are specialised in mental health problems.

'There needs to be a better understanding of the different diagnoses and what they mean for the individual forecasts.'

Yet with today's knowledge problems in mental health do not generally belong into the category where risks are overly high. There needs to be a better understanding of the different diagnoses and what they mean for the individual forecasts. You may be lucky enough not to be a sufferer today, but if one in

five people experience a mental health problem in a typical year there are many sufferers around you under threat of being underinsured. And the pandemic means that this year is not a typical year.

While current research shows that suicide rates are going down, longitudinal statistics also show that people with mental health problems have in the long run higher mortality. The causes of death for these persons are not related directly to mental health but rather to the traditional causes, e.g., cardiovascular problems.

This higher mortality may actually be more likely to be driven by the lower socioeconomic status of sufferers. It is well documented that mortality differences between socioeconomic groups are large, with well-off people living much longer than the less fortunate ones.

Individuals with mental health issues are vulnerable when it comes to the risk of ending up in the lower socioeconomic category.

There are many risk factors creating the stress that drives persons with mental health problems into a lower socioeconomic category.

One very important factor comes from the difficulty of getting good employment. Another factor results from the difficulty of getting affordable therapy before too long a delay after a diagnosis. These together with other factors create the so-called intersectional stress that hurts vulnerable individuals, among them those with mental issues. The risk can be exacerbated by issues like ethnicity, age and lack of support from the immediate family due to stigma, for example.

Getting insurance cover is certainly not the most important stress factor driving vulnerable individuals into a lower socioeconomic status. But it may be a contributing factor to intersectional stress.

Actuaries should actively look for better solutions when it comes to insuring individuals with mental issues. Without a better understanding a substantial share of the population will be left without cover without any actuarially sound reason. This exclusion may also drive people into a lower socioeconomic status, with many adverse consequences together with lower longevity. Actuaries should be part of the solution and not part of the problem when it comes to fostering social inclusion.

'Individuals with mental health issues are vulnerable when it comes to the risk of ending up in the lower socioeconomic category.'

Esko shares the experience of being denied cover due to his panic disorder, luckily well treated with therapy and pills.

ESKO KIVISAARI MSc is Fellow of the Actuarial Society of Finland and Deputy Managing Director of Finance Finland (member of Insurance Europe, EBF and Efama). He is also Past Chairperson of the Actuarial Association of Europe, and he was a member of the High-Level Expert Group on Sustainable Finance.

A CONTINUOUSLY DEVELOPING PROFESSION IN CHALLENGING TIME

BY **JENNIFER BAKER**

The world is changing. That is not new, but the Covid19 pandemic, globalisation, technological progress and demographic change are profoundly impacting OECD labour markets on a scale not seen before. Alongside these seismic changes there is, in Europe, a push towards more evidence-based, fact-checked policy making; on that basis Social Security Actuaries can make a real difference.

There has been a quantifiable change not only in the quantity and quality of jobs that are available, but also the way in which and by whom they are carried out. Work patterns are diverging from the full-time dependent employee model on the basis of which social protection systems have, in principle, been designed. The resulting and varied concerns of scheme members play out broadly in the process of '*political economy*'.

Insecurity, unfairness, and growing tensions among different groups seem to reflect a growing perception of increases in overall inequality, leading to a growing demand for adjustments in the social contract.

Social Security Actuaries are able to assess the relevant dynamics of the changing balance between groups – in particular (but not limited to) between younger and older age cohorts. This should contribute to the design of new institutional frameworks, consistent with those dynamics. Actuarial modelling approaches and methodologies are built on projections of future cash flows, which facilitate assessment of the short-, medium- and long-term impact of pension policies and reforms on adequacy and sustainability of pension system provision in an integrated way. When assessing the adequacy and sustainability of pensions, qualitative as well as quantitative terms are important, particularly in the following areas:

- The calculation methods for the European Commission periodical Reports on Ageing and Pension Adequacy;
- The development of pension adequacy measures, including replacement ratios, which themselves may be defined in a variety of ways;
- The use of pension projection methods;
- Compliance with ISAP2 and with the ISSA/ILO Actuarial Guidelines;
- Pension tracking Services in the EU countries;
- Technical input aimed at making suggestions

'what role should actuaries play with regard to social security?'

for strengthening the methodology and reporting framework for public pension projections under the Eurostat Table 29 pension data exercise; and
- Long-term demographic projection.

While it may be natural to approach many of the topics noted above in a perspective focusing on pension benefits, and hence pension scheme liabilities, it may be useful to recall that actuarial methods are equally applicable the expense side of scheme management. This is a field that needs to develop further as there exist few comparative studies of total pension provision and their costs.

In recent times, we see evidence that policy-makers are, generally, beginning to take increasing note of the advice of actuaries working in Social Security. However, the Social Security Actuaries should continue to communicate their profession in a clear way to enhance peoples' understanding in questions as '*what role should actuaries play with regard to social security?*' '*What would be the specific contribution to the wellbeing of society?*'

Discussions focused on helping people to develop their understanding of their pension entitlements more deeply are welcome. But it is important to raise awareness of issues and challenges relating to pensions, both to institutions and to the public and to point out that Social Security actuaries have the necessary tools to implement solutions.

In conclusion, when considering the role of the Social Security Actuary, the overall aim should be to advance solutions to challenges facing the member states, not least by increasing public understanding of the way in which social security contributes to economic security, while taking into account the differing frameworks in different member states.

The objective of Social Security Actuaries is to ensure that, in the long term, pension benefits sufficient at least to prevent poverty will be provided to all European citizens. It is therefore worthwhile to create a forum in which those actuaries in different countries who are working with social security institutions may be enabled to collaborate effectively.

INSURTECH: HOW TO BUILD A NEW INSURANCE PRODUCT?

THE EXAMPLE OF GAIA, A LONDON-BASED STARTUP

BY **FLORIANE MOY**

Most startups start with identifying an issue and designing a solution to solve it. In our situation, Gaia started from a personal experience and aims at addressing a major health problem: infertility. Affecting one in six couples, infertility is the world's third largest disease globally after cancer and cardiovascular disease.

FLORIANE MOY is Data Lead at Gaia, London. She carries a Master of Financial Engineering.

Realizing that there has to be a better way to access fertility care was the key driver. Building a viable business is another step which requires raising capital, building a dedicated team and finding efficient distribution channels and partners. Insurance starts from the ability to predict the likelihood of risk and sharing it amongst a pool of people. However, it often suffers from conflict of interest and there is an opportunity to solve that problem in fertility care insurance.

For our business case, treatments are expensive and chances of success are low (25% chance of success at each cycle which costs £5,000 on average, according to the HFEA). Designing a viable solution is challenging so we had to find a way to predict the chances of success and assess risk: on this basis we can price an insurance product which reshapes the way people pay for IVF. This creative process and the risk of failure along the way can be hard to deal with, but there's also a certain thrill that comes with it for all the employees!

FIGURE 1: HOW OUR PRODUCT WORKS

FIRST MARKET: THE UK!

In many countries like the UK or the US, access to fertility treatment is not sufficiently covered by public funding. As a result, 75% of the people don't start the treatment they need because of money. Starting a company in the UK was a natural response for Nader AlSalim, Gaia's CEO, who experienced it in London: '*Gaia didn't come about as the result of some deliberate actions to build a business. It was a natural response to a horrible experience my wife and I had gone through in order to conceive our first child*'.

AN EMOTIONAL JOURNEY

Fertility is a sensitive topic and our members are vulnerable people that are going through a lot: some had difficult experiences in the past, many have high expectations regarding our solution and all will go through an emotional journey. Empathy is the main driver in the design of our product and we try to anticipate all edge cases. Gaining our members' trust and bringing them the peace of mind they need is a core priority here. This is why we decided to offer all our members complementary counselling consultations.

DEDICATED TEAM / TRYING TO THINK OUTSIDE THE BOX

Fair access to fertility treatment has never been solved before in the UK market. To reach this goal, we built a complete team that shares the motivation and is able to think outside the box: consider a solution, test it, maybe fail, and iterate on it, as in '*The Lean Startup*' book from Eric Ries.

DATA AT THE CORE OF OUR PRODUCT

Here comes the actuary! The core of our product is our ability to use data to predict outcomes and underwrite risk. So our actuaries had to build a predictive model trained on more than a million of observations of IVF and ICSI rounds that are either fresh cycles or frozen embryos transfers. Using such data at a very granular level and applying machine learning techniques allows us to identify the impact of key metrics on IVF outcomes and to increase predictive performance. Thus, the product is driven by our model that uses personal and medical information about our members to predict their personalized success rates and offer them fertility at a fair and transparent price. Dealing with such sensitive data requires lots of attention to make sure its storage and access are safe and secure. Data anonymization in this context is completely core, as per the UK GDPR.

UNCERTAINTY AND RISK PROVIDERS

Insuring a new risk comes with uncertainty. Our product finances our members' IVF treatments and insures them against the risk of not achieving a live birth. Because of the lack of solutions today, only a small portion of

people get treated for infertility. The available data therefore does not perfectly reflect the patients' behaviors should they benefit from our plans. We also observe changes in the fertility market regarding the patients' demographic, the clinics' success rates, the medical techniques and recommendations. Fertility chances are predictable and our model's performance gives us confidence in our predictions, but it also needs to be closely monitored to account for potential data drift overtime. Therefore a key challenge for us is to harness large complex health data to accurately predict treatment outcomes and underwrite the risk. This enables to reassure our third-party, so that they can back us and further support the development of our startup.

COLLECTIVE EFFORT

It takes a team to create innovative ways to address the challenges ahead of us. We'll need to invent new tools, new ways to communicate and challenge our assumptions and stigma around fertility. This collective effort extends beyond the scope of our team as we must create new types of partnerships with providers (clinics), medical experts (doctors and nurses) and underwriters (insurers) - to give everyone a fair access to fertility care.

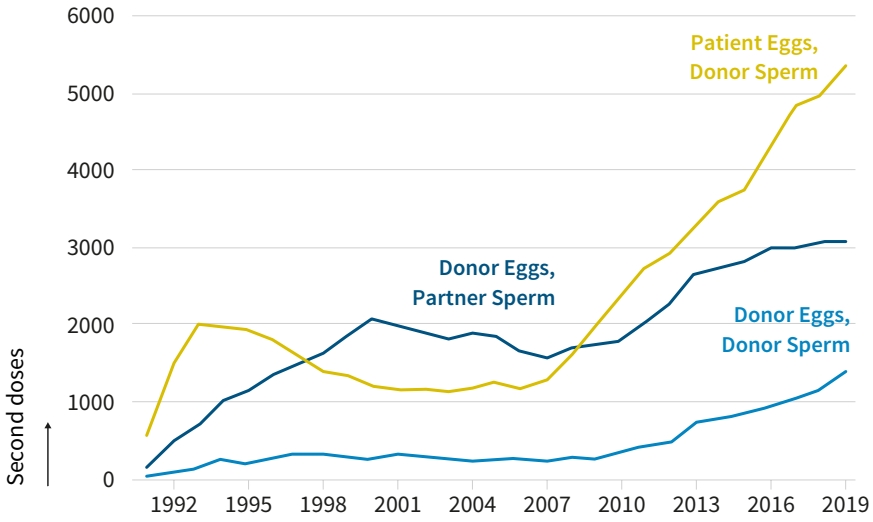
WHAT'S NEXT?

We are starting with our first product, that we could call our '*MVP*' in the Lean Startup culture, serving IVF and egg donation before moving to other parts of reproductive health. Gaia is about changing the norms around family building so we want to offer more people early options with regards to taking control of their decisions and insuring themselves from the financial unknown.

We will therefore have to grow our team and hopefully our community of members on the journey so we collectively solve that problem at scale.

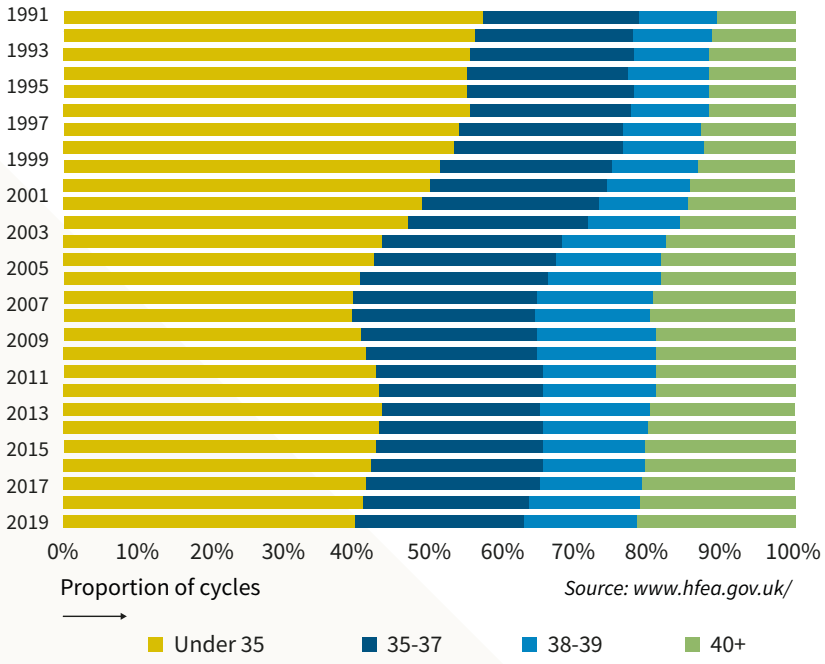
A natural next step for us will be expanding to the US as fertility markets have similarities, but that will take a lot of preparation and will be an even bigger challenge for all of us!

FIGURE 2: THE USE OF SPERM AND EGGS DONORS INCREASES
NUMBER OF IVF CYCLES BY EGG AND SPERM SOURCE (1991-2019)



Source: www.hfea.gov.uk/

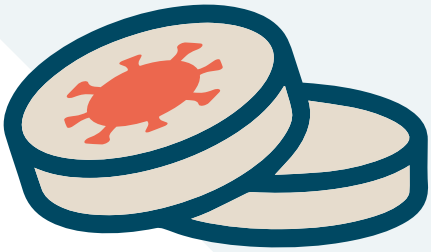
FIGURE 3: THE PORTION OF OLDER PATIENTS INCREASES
PROPORTION OF IVF CYCLES BY PATIENT AGE GROUP (1991-2019)



Source: www.hfea.gov.uk/

LIFE AND NON-LIFE INSURANCE ARE THE TWO SIDES OF THE COVID-19 COIN

BY **ROMAIN DURAND**



Covid-19 reminds us of the complex relationship between insurance and state-driven solutions in modern economies. Many governments rightly chose to spare as many lives as possible at the expense of the economy. In so doing they have triggered an unintended consequence for the insurance industry: what would be normally considered a life insurance issue – pandemic risk - turned out to be largely a non-life problem. In protecting lives through repeated and tight lockdowns, governments have, so to speak, moved the burden from life to non-life, from mortality to business interruption. This translated in a string of trials to determine what was covered and what was not under non-life policies. It also questioned the possibility to insure some events determined by a '*fait du prince*', or act of state.

But at the same time, it limited the load for life insurers and avoided the potential nightmare of the 1918 crisis. However, looking back to 1918 shows that even in these difficult circumstances, life insurance fared relatively well in the middle of a major human disaster.

> *'In 1918 one in 10 died, overall mortality being consequently around 3 per cent'*

The figures of 1918 are very different from those of 2020: the total number of people infected reached a stunning 500 million or 30% of the then-estimated worldwide population. Out of which one in 10 died, overall mortality being consequently around 3 per cent, far from the current estimated 0,6 per cent for Covid-19.

In those times, the war made government reactions complicated as it did not want to show weakness to the enemy[1], and transparency of information was limited by censorship; the

[1] Spain, a neutral state, was the first to declare cases and the virus was consequently attributed to this country by belligerents, too happy to hide their own cases...

vast majority of medical staff, doctors and nurses worked for the Army which made it difficult to treat civilians. In a highly debatable move, the US army even continued to convey soldiers to Europe in overcrowded ships after beginning of the disease. Lockdowns, hand washing and masks came late as well as efficient treatments. Coupled with a less developed non-life insurance offering, the crisis remained a life insurance problem.

'It was estimated that life insurance had to pay a staggering 0.5 per cent of US GNP in less than 2 years'

For life insurers the times were particularly difficult as exemplified by the US life insurance industry, already well developed since the end of nineteenth century.

First, insurers had to face a tide of claims. Contrary to Covid-19, the '*Spanish lady*' or '*Spanish flu*', as it was known, caused an overreaction of the body's immune system and 25–40-year-olds with their stronger immune systems suffered more deaths - an age band more likely to be insured. Metropolitan Life Insurance reported that 6.21 per cent of all coal miners whom it insured between twenty-five and forty-five years old died; in the same age group, 3.26 per cent of all industrial workers it insured died. And claims had to be settled relatively quickly as death was reaping breadwinners in families. Moreover insurance company had few staff to settle claims, some being drafted and others being sick (as for Covid-19 pandemic, employees were forbidden to show in the office in case of flu) which translated into an administrative quagmire.

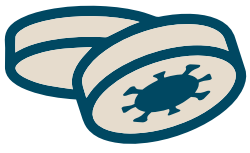
Second, the amounts at stake were gigantic. It was estimated that life insurance had to pay a staggering 0.5 per cent of US GNP in less than 2 years. However, no insurer declared bankruptcy during this period. The crisis also muted the critics who accused the insurers of overcharging mortality rates which were common prior to World War I and people realised that covering pandemic exposures required some reserves.

'And the potential risk would have been a bank run, adding financial woes to the Pandemic ones'

Insurance pre-finances claims through premiums and reserves. In so doing it provides a solution that fosters stability of economic systems. What would have happened in 1918 without life insurance? The money necessary to households (to provide after the death of a breadwinner) would have come from bank accounts. And the potential risk would have been a bank run, adding financial woes to the Pandemic ones. Through life insurance, households were provided with resources without tapping excessively in banking accounts.

In 2020, absent a sufficient insurance solution for business interruption, governments had to intervene and heavily finance the economy. One conclusion is that insurance has been a key pillar of our societies since the beginning of the last century. Where income protection is provided by insurers, it guarantees economic stability by pre-financing the claims as was the case during the Pandemic of 1918-1919. Where it is not provided by insurers, it has to be provided by governments as happened in 2020 and 2021 through loans, subsidies and tax cuts. The difference is perhaps that we have no clear idea of the potential consequences of this alternative way of providing protection through printing money.

Last but not least the Covid-19 crisis makes us think about the correlation between life and non-life and the role governments are playing in this. By giving priority to saving lives over any other considerations (which is reasonable) will governments always '*play*' in favour of life insurers against non-life?



ROMAIN DURAND is Head of life Reinsurance at Groupe Covéa.

COLUMN

GIAMPAOLO CRENCA ELECTED AS AAE BOARD MEMBER

Giampaolo Crenca was elected as AAE Board member during the last General Assembly in Switzerland. He is a Fully Qualified Actuary, registered in the official public list (albo) in Italy, graduated in Statistical and Actuarial Sciences, has a PhD in Actuarial Sciences, and is Principal Actuary of a professional office. He has carried out and continues to carry out professional activities in all sectors of actuarial consulting, especially in insurance, financial, social security and risk management.

From 2010 to 2020 he was President of the National Council of Actuaries and continues to be very engaged in the development's project of the actuarial profession in Italy and, as President ISOA, he represents the Italian Actuaries in Europe (AAE) and in the world (IAA). Particularly in AAE he is already engaged in the Working Group on Communication and in the TEA Board and in the recent past he was a member of the Nomination Panel.

He is lecturer in '*financial mathematics*', '*Actuarial Technique of Non-Life Insurance*', '*Analysis and policy plans of welfare*', '*Laboratory of actuarial techniques*', '*Technical advanced actuarial course*' in four different Italian universities, and author of numerous publications and articles on pension, insurance and financial matters.

Giampaolo Crenca said, after the election: '*The main motivation taking on this new task is make an effective contribution to the development of the actuarial profession in Europe, bringing experience of the Italian development project that we have been carrying out for over ten years to consolidate traditional fields (insurance, pension) and to develop the wider fields. To accomplish this, good education and communication are necessary, preliminary, fundamental and indispensable aspects. The contribution I wish to make is both operational and above all strategic.*'

COLOPHON

The European Actuary (TEA) is the quarterly magazine about international actuarial developments. TEA is written for European actuaries, financial specialists and board members. It will be released primarily as e-mail newsletter. The views and opinions expressed in TEA are those of the authors and do not necessarily reflect the official policy or position of the Editorial Board and/or the AAE.
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NEXT ISSUE:

The next issue will appear 1 March 2022.
Suggestions can be e-mailed to info@theeuropeanactuary.org
The deadline is 1 February 2022.

EUROPEAN AGENDA

Please check http://actuary.eu/event-calendar/ for the most actual forthcoming events.

ADVERTISING IN THE EUROPEAN ACTUARY

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